ΙΔΡΥΜΑ ΕΥΓΕΝΙΔΟΥ
1954

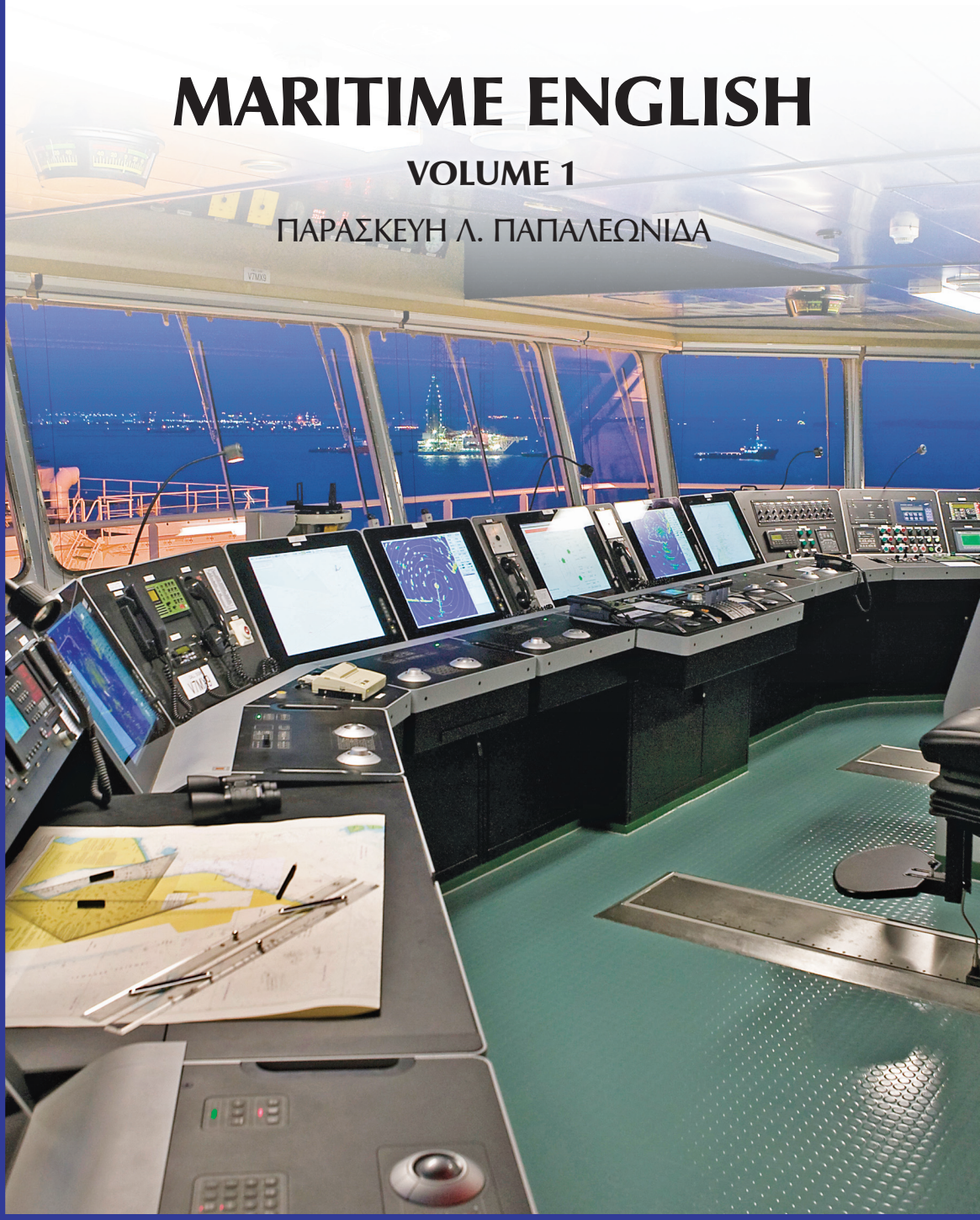
ΧΡΥΣΟΥΝ ΜΕΤΑΛΛΙΟΝ
ΑΚΑΔΗΜΙΑΣ ΑΘΗΝΩΝ

ΕΚΠΑΙΔΕΥΤΙΚΟ ΚΕΙΜΕΝΟ
ΑΚΑΔΗΜΙΩΝ ΕΜΠΟΡΙΚΟΥ ΝΑΥΤΙΚΟΥ

MARITIME ENGLISH

VOLUME 1

ΠΑΡΑΣΚΕΥΗ Λ. ΠΑΠΑΛΕΩΝΙΔΑ



ΑΘΗΝΑ 2017

ΙΔΡΥΜΑ ΕΥΓΕΝΙΔΟΥ

ΧΡΥΣΟΥΝ ΜΕΤΑΛΛΙΟΝ ΑΚΑΔΗΜΙΑΣ ΑΘΗΝΩΝ

ΕΚΠΑΙΔΕΥΤΙΚΟ ΕΓΧΕΙΡΙΔΙΟ

ΑΚΑΔΗΜΙΩΝ ΕΜΠΟΡΙΚΟΥ ΝΑΥΤΙΚΟΥ

Α΄ ΕΚΔΟΣΗ 2015
ISBN: SET 978-960-337-122-9
978-960-337-121-2

ΠΡΟΛΟΓΟΣ ΙΔΡΥΜΑΤΟΣ ΕΥΓΕΝΙΔΟΥ

Το 1952 ο Ευγένιος Ευγενίδης (1882-1954) όρισε με τη διαθήκη του τη σύσταση του Ιδρύματος Ευγενίδου, του οποίου ως μοναδικό σκοπό έταξε «νὰ συμβάλῃ εἰς τὴν ἐκπαίδευσιν νέων ἑλληνικῆς ὑπηκοότητος ἐν τῷ ἐπιστημονικῷ καὶ τεχνικῷ πεδίῳ». Ο ιδρυτής και χορηγός του Ιδρύματος Ευγενίδου ορθά προέβλεψε ότι αναγκαίο παράγοντα για την πρόοδο της Ελλάδος αποτελεί η άρτια κατάρτιση των Ελλήνων τεχνιτών κατά τα πρότυπα της επαγγελματικής εκπαιδεύσεως άλλων ευρωπαϊκών χωρών.

Την 23η Φεβρουαρίου του 1956 εγκρίθηκε η σύσταση του κοινωφελούς Ιδρύματος Ευγενίδου, την διαχείριση του οποίου κατά την ρητή επιθυμία του ιδρυτή του ανέλαβε η αδελφή του Μαριάνθη Σίμου (1895-1981). Τότε ξεκίνησε η υλοποίηση του σκοπού του Ιδρύματος και η εκπλήρωση μίας από τις βασικότερες ανάγκες του εθνικού μας βίου από την Μαριάνθη Σίμου και τους επιστημονικούς συνεργάτες της.

Το έργο της Μαριάνθης Σίμου συνέχισε από το 1981 ο πολύτιμος συνεργάτης και διάδοχος του Ευγενίου Ευγενίδη, Νικόλαος Βερνίκος-Ευγενίδης (1920-2000). Από το 2000 συνεχιστής του έργου του Ιδρύματος Ευγενίδου έχει αναλάβει ο Λεωνίδας Δημητριάδης-Ευγενίδης.

Μία από τις πρώτες δραστηριότητες του Ιδρύματος Ευγενίδου, ευθύς μετά την ίδρυσή του, υπήρξε η συγγραφή και έκδοση κατάλληλων διδακτικών εγχειριδίων για τους μαθητές των τεχνικών σχολών, καθώς διαπιστώθηκε ότι αποτελεί πρωταρχική ανάγκη ο εφοδιασμός των μαθητών με σειρές από βιβλία, τα οποία θα έθεταν τα ορθά θεμέλια για την παιδεία τους και θα αποτελούσαν συγχρόνως πολύτιμη βιβλιοθήκη για κάθε τεχνικό. Καρπός αυτής της δραστηριότητας είναι η Βιβλιοθήκη του Τεχνίτη (1957-1975), η οποία αριθμεί 32 τίτλους, η Βιβλιοθήκη του Τεχνικού (1962-1975), που περιλαμβάνει 50 τίτλους, η Τεχνική Βιβλιοθήκη (1969-1980) με 11 τίτλους και η Βιβλιοθήκη του Τεχνικού Βοηθού Χημικού (1971-1973) με 3 τίτλους. Επί πλέον, από το 1977 μέχρι σήμερα έχουν εκδοθεί 171 τίτλοι για τους μαθητές των Τεχνικών και Επαγγελματικών Λυκείων και 16 για τους μαθητές των Σχολών Μέσης Τεχνικής και Επαγγελματικής εκπαιδεύσεως.

Ξεχωριστή σειρά βιβλίων του Ιδρύματος Ευγενίδου αποτελεί η Βιβλιοθήκη του Ναυτικού (1967 έως σήμερα), η οποία είναι το αποτέλεσμα της συνεργασίας του Ιδρύματος Ευγενίδου με την Διεύθυνση Εκπαιδεύσεως Ναυτικών του Υπουργείου Ναυτιλίας. Η συγγραφή και έκδοση των εκπαιδευτικών εγχειριδίων για τους σπουδαστές των ναυτικών σχολών ανετέθη στο Ίδρυμα Ευγενίδου με την υπ' αριθμ. 61288/5031/9.8.1966 απόφαση του Υπουργείου Εμπορικής Ναυτιλίας, οπότε και λειτούργησε η αρμόδια Επιτροπή Εκδόσεων, η οποία είχε συσταθεί ήδη από το 1958. Η συνεργασία Ιδρύματος Ευγενίδου και Υπουργείου Εμπορικής Ναυτιλίας ανανεώθηκε με την υπ. αριθμ. Μ2111.1/2/99 υπουργική απόφαση όπως τροποποιήθηκε από την Μ3611.2/05/05/16-12-2005, με την οποία το ΥΕΝ ανέθεσε στο Ίδρυμα Ευγενίδου την συγγραφή διδακτικών εγχειριδίων για τις Ακαδημίες Εμπορικού Ναυτικού.

Στην Βιβλιοθήκη του Ναυτικού περιλαμβάνονται συνολικά 137 τίτλοι μέχρι σήμερα: 27 τίτλοι για τις Δημόσιες Σχολές Εμπορικού Ναυτικού (1967-1979), 42 τίτλοι για τις Ανώτατες Δημόσιες Σχολές Εμπορικού Ναυτικού (1981-2001), 39 τίτλοι για τις Ακαδημίες Εμπορικού Ναυτικού, 13 εγχειρίδια κατευθυνόμενης εκπαιδεύσεως επί πλοίου και 16 μεταφράσεις ναυτικών εγχειριδίων.

Όλα τα βιβλία της Βιβλιοθήκης του Ναυτικού, εκτός του ότι έχουν συγγραφεί σύμφωνα με τα αναλυτικά προγράμματα διδασκαλίας των σχολών και ανταποκρίνονται στις ανάγκες των σπουδαστών, είναι γενικότερα χρήσιμα για όλους τους αξιωματικούς του Εμπορικού Ναυτικού, που ασκούν το επάγγελμα ή εξελίσσονται στην ιεραρχία. Επί πλέον οι συγγραφείς και η Επιτροπή Εκδόσεων

καταβάλλουν κάθε προσπάθεια ώστε τα βιβλία να είναι επιστημονικώς άρτια αλλά και προσαρμοσμένα στις ανάγκες και στις δυνατότητες των σπουδαστών.

Την περίοδο 2012-2013 το ΥΝΑ με το υπ' αριθμ. Μ3616/01/2012/26-09-2012 έγγραφο ανέθεσε στην Επιτροπή Εκδόσεων του Ιδρύματος Ευγενίδου την σύσταση ειδικής ομάδας εργασίας εμπειρογνωμόνων για την επικαιροποίηση των αναλυτικών προγραμμάτων σπουδών για τις ΑΕΝ, τα ΚΕΣΕΝ και τα ειδικά σχολεία Πλοιάρχων και Μηχανικών, εφαρμόζοντας τις νέες απαιτήσεις εκπαιδεύσεως και πιστοποιήσεως ναυτικών της Διεθνούς Συμβάσεως STCW '78 (Standards of Training, Certification and Watchkeeping for Seafarers – Manila amendments 2010). Με βάση τα νέα αναλυτικά προγράμματα για τις ΑΕΝ, τα οποία εφαρμόστηκαν για πρώτη φορά την χρονιά 2013-2014, ξεκίνησε από το 2014 και η επικαιροποίηση των υφισταμένων διδακτικών εγχειριδίων, προκειμένου αυτά να είναι συμβατά με τις νέες διεθνείς απαιτήσεις.

Με την προσφορά των εκδόσεών του στους καθηγητές, στους σπουδαστές των ΑΕΝ και σε όλους τους αξιωματικούς του Εμπορικού Ναυτικού, το Ίδρυμα Ευγενίδου συνεχίζει να συμβάλλει στην τεχνική εκπαίδευση της Ελλάδος, υλοποιώντας επί 60 και πλέον χρόνια το όραμα του ιδρυτή του, αείμνηστου ευεργέτη Ευγενίου Ευγενίδου.

ΙΔΡΥΜΑ ΕΥΓΕΝΙΔΟΥ
ΒΙΒΛΙΟΘΗΚΗ ΤΟΥ ΝΑΥΤΙΚΟΥ

MARITIME ENGLISH

VOLUME I

ΠΑΡΑΣΚΕΥΗΣ Λ. ΠΑΠΑΛΕΩΝΙΔΑ
Καθηγήτριας Αγγλικής ΑΕΝ/Μακεδονίας

ΑΘΗΝΑ
2018

ΠΡΟΛΟΓΟΣ ΣΥΓΓΡΑΦΕΑ

Το βιβλίο αυτό αποτελεί διδακτικό βοήθημα για το μάθημα «Ναυτικά Αγγλικά» Α', Β' και Γ' εξαμήνου στις Ακαδημίες Εμπορικού Ναυτικού και στοχεύει να βοηθήσει τους/τις σπουδαστές/ριες να αποκτήσουν τις γλωσσικές δεξιότητες εκείνες, που θα τους επιτρέψουν να επικοινωνούν με ευχέρεια στο επαγγελματικό τους περιβάλλον, δηλαδή να ανταποκρίνονται σε γενικότερες και ειδικότερες καταστάσεις επικοινωνίας ως Αξιωματικοί του Εμπορικού Ναυτικού. Με γνώμονα τις προδιαγραφές του Διεθνούς Ναυτιλιακού Οργανισμού (IMO) (Model Course 3.17 για τα Ναυτικά Αγγλικά) το βιβλίο Maritime English Volume I δίνει έμφαση στην «επικοινωνιακή επάρκεια» των Αξιωματικών Φυλακής στην Αγγλική, ενισχύοντας την επικοινωνιακή μεθοδολογία. Χρησιμοποιώντας σύγχρονα αυθεντικά κείμενα ναυτικού ενδιαφέροντος, τονίζοντας την αλληλεπίδραση με την προώθηση της κατανόησης του λόγου κατά ζεύγη και ομάδες, συμπεριλαμβάνοντας συνεντεύξεις, εφιστώντας την προσοχή σε στρατηγικές αυτοδιαχείρισης της μαθήσεως και μέσα από δραστηριότητες που προσομοιώνουν (κατά το δυνατό) αυθεντικές διαδραστικές καταστάσεις και επιτρέπουν στους/στις σπουδαστές/ριες να ασκούνται ως εν δυνάμει πομποί και δέκτες σε πραγματικά επικοινωνιακά γεγονότα, το βιβλίο ανταποκρίνεται στις ανάγκες της Αγγλικής για Ειδικούς Σκοπούς.

Οι γλωσσικές δεξιότητες που εξασκούνται σε κάθε άσκηση, καθώς και ο κεντρικός της άξονας επισημαίνονται με ειδικά σύμβολα στην αρχή κάθε ασκήσεως, ως εξής: α) Ομιλία β) Ανάγνωση γ) Γραπτός Λόγος δ) Κατανόηση Προφορικού Λόγου – Συζήτηση στην τάξη, ε) Αυτοαξιολόγηση, στ) Εργασία κατά ζεύγη ζ) Εργασία σε Ομάδες η) Πληροφορίες και θ) Κατανόηση ακουστικού κειμένου.


α)


β)


γ)


δ)


ε)


στ)


ζ)


η)


θ)

Ιδιαίτερη προσοχή δίνεται στις Τυποποιημένες Ναυτικές Φράσεις Επικοινωνίας (IMO SMCP), και επιχειρείται παρουσίαση και εξάσκηση των φράσεων στις επιμέρους ενότητες του βιβλίου, ανάλογα με το θέμα. Επίσης, η πρώτη Ενότητα (Unit 1) είναι αφιερωμένη αποκλειστικά στους όρους που περιλαμβάνονται στο Γλωσσάριο Ναυτικών Όρων και στα Γενικά Θέματα (Glossary & General) του σχετικού βιβλίου του IMO "Standard Marine Communication Phrases".

Οι γραμματικές δομές που απαντώνται στα επιμέρους θέματα παρουσιάζονται σε Παράρτημα (Appendix V: Grammar) και υπάρχει σχετική παραπομπή σε αυτό κάθε φορά που χρησιμοποιείται για πρώτη φορά σε ασκήσεις ένα συγκεκριμένο γραμματικό φαινόμενο, ώστε αν υπάρχουν απορίες/ανάγκη να ανατρέχουν σε αυτό οι σπουδαστές.

Μετά από κάθε κείμενο δίνεται ένα «Γλωσσάριο» (Glossary) στο οποίο παρατίθενται συνώνυμα ή ορισμοί για το λεξιλόγιο του κειμένου, ώστε να αποτελέσει σημείο αναφοράς για την εξάσκηση και επανάληψη του λεξιλογίου και να ενθαρρύνει τους/τις σπουδαστές/ριες να κρατούν τις δικές τους Άγγλο-Αγγλικές σημειώσεις λεξιλογίου με παρόμοιο τρόπο.

Το βιβλίο συνοδεύεται από ένα Audio CD που περιέχει υλικό για τις δραστηριότητες κατανοήσεως προφορικού λόγου. Τα απομαγνητοφωνημένα κείμενα των ασκήσεων παρατίθενται σε Παράρτημα (Appendix III: Audio Material Transcripts), το οποίο χωρίζεται σε τρία μέρη, ένα για κάθε εξάμηνο σπουδών.

Το βιβλίο απευθύνεται σε τάξεις μεικτής ικανότητας και για το λόγο αυτό καταβλήθηκε προσπάθεια, ώστε να προσφέρει στον διδάσκοντα την ευελιξία να επιλέγει, ανάλογα με το επίπεδο της τάξεως, από μια ποικιλία διδακτικού υλικού. Βασίζεται δε στο ισχύον αναλυτικό πρόγραμμα διδασκαλίας των ΑΕΝ και για τις δύο ειδικότητες, Πλοιάρχων και Μηχανικών. Για την ειδικότητα των Πλοιάρχων, το διδακτικό

*υλικό παρουσιάζεται σε 5 ενότητες (Units) για κάθε εξάμηνο. Υπάρχουν επίσης 3 επαναληπτικές ενότητες (Reviews) με ολοκληρωμένες δραστηριότητες αποτελούμενες από ασκήσεις που βοηθούν στην εμπέδωση της σχετικής ορολογίας και την επέκταση ειδικών θεμάτων. Για την ειδικότητα των Μηχανικών, τα θέματα που προβλέπονται στην διδακτέα ύλη και είναι κοινά με αυτά των Πλοιάρχων καλύπτονται στο κύριο μέρος του βιβλίου, ενώ τα ειδικά θέματα των Μηχανικών παρουσιάζονται σε ένα Παράρτημα για Μηχανικούς (Appendix I: English for Marine Engineers), το οποίο αποτελείται από τρία μέρη, ένα για κάθε εξάμηνο. Καθώς οι Μηχανικοί διδάσκονται, πέρα από το Παράρτημα που τους αφορά, **επιλογές** από το κυρίως μέρος του βιβλίου, παρατίθεται πίνακας με την ύλη ανά εξάμηνο προς διευκόλυνση των χρηστών του βιβλίου και των διδασκόντων.*

Εξάμηνο	Πλοίαρχοι	Μηχανικοί
Α′	Units 1-5, Review 1	Unit 2, Unit 3, Unit 4, Unit 5 (χωρίς την ενότητα “Nautical charts and aids to navigation”), Appendix I/Part One
Β′	Units 6-10, Review 2	Unit 6 (χωρίς την ενότητα “SMCP: Passenger care”), Unit 8 (χωρίς τις ενότητες “Navigation equipment” και “SMCP: Pilot on the bridge”), Appendix I/Part Two
Γ′	Units 11-15, Review 3	Unit 12, Unit 13 (χωρίς την ενότητα “Maintenance duties in the deck department”), Unit 14 (χωρίς την ενότητα “VTS standard phrases”), Appendix I/Part Three

Θα ήθελα να ευχαριστήσω την Επιτροπή Εκδόσεων του Ιδρύματος Ευγενίδου για την συμπαράστασή της κατά την πραγμάτωση αυτού του έργο. Είχα την μεγάλη χαρά να συνεργαστώ με το εξειδικευμένο προσωπικό του Εκδοτικού Τμήματος του Ιδρύματος, χωρίς την αμέριστη βοήθεια και τις φιλότιμες προσπάθειες του οποίου, το βιβλίο δεν θα έπαιρνε την τελική του μορφή, και του ανήκουν ιδιαίτερες ευχαριστίες.

Είμαι ευγνώμων στον επιστημονικό σύμβουλο του βιβλίου, κ. Γεώργιο Δούναβη, καθηγητή Αγγλικής στην ΑΕΝ Σύρου, για την άψογη συνεργασία μας και την αδιάλειπτη παρουσία του ως υποστηρικτή αυτού του έργου και ως πολύτιμου συναδέλφου.

Ιδιαιτέρως ευχαριστώ για το απαραίτητο υλικό και τις συμβουλές που μου παρείχαν τους Πλοιάρχους Ε.Ν. κ.κ. Άκη Χαραλαμπίδη, Αθανάσιο Καρπώνη, Κώστα Καρυαδάκη, Κώστα Δημάνη.

Θα ήθελα να ευχαριστήσω την κ. Κάτια Γρηγόρογλου, πρ. Καθηγήτρια Αγγλικής στη Σχολή Μηχανικών της ΑΕΝ Μακεδονίας, που με προθυμία μοιράστηκε μαζί μου υλικό για το Παράρτημα των Μηχανικών, τον κ. Σωτήρη Χατζημανώλη (Μηχανικό Α′ Ε.Ν.) για τη βοήθειά του, και την κ. Αθηνά Μπιρμπίλη, Καθηγήτρια Αγγλικής στη Σχολή Μηχανικών, για τις διορθώσεις στο Παράρτημα των Μηχανικών.

Για την πρόθυμη βοήθειά τους στην ηχογράφηση ακουστικού υλικού που χρησιμοποιείται στο βιβλίο, ευχαριστώ θερμά τους/τις καθηγητές/τριες Αγγλικής Laurie Drakontis, Δημητρή Κουσκούκη, Tom Muravez, Fengmin Wang, Δάνα Ρηγάκη, και τους Πλοιάρχους Jan Hork, Νικόλαο Μαύρο, Μιχάλη Σιδέρη, Νικόλαο Τσούλη.

Ειδική μνεία οφείλω στο Piraeus VTS Centre για την ευγενική παροχή ηχογραφημένου υλικού που αφορά στη θαλάσσια κυκλοφορία ρουτίνας.

Τέλος, θα ήθελα να εκφράσω την ευγνωμοσύνη μου σε όλους τους σπουδαστές της ΑΕΝ Μακεδονίας που, ανταποκρινόμενοι με ενθουσιασμό, παρείχαν φωτογραφίες από τις ιδιωτικές τους συλλογές και βοήθησαν στη δημιουργία ακουστικού υλικού.

Η συγγραφέας

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UNIT 1

IMO Standard Marine Communication Phrases

1. *IMO Standard Marine Communication Phrases*
2. *Spelling, Numbers and Call Signs*
3. *What's the time?*
4. *Distress, Urgency and Safety Signals*
5. *PA announcements/Instructions on how to put on your lifejacket*
6. *Standard Wheel Orders [SMCP A2/1]*
7. *Position; bearing; course; distance; speed; draught*
8. *Glossary*

Round-up

1. IMO Standard Marine Communication Phrases

Seafarers and the shipping industry use Maritime English as a common tool of communication. The Standard Marine Communication Phrases (SMCP) are an important part of Maritime English.

Crews of different nationalities work on board vessels and speak many different languages. Problems in verbal communication are a danger to the vessel, the people and the environment. Seafarers need a standard language to communicate with, for navigation at sea, in port, and on board vessels with multilingual crews. So, the **IMO** (International Maritime Organisation) proposes the SMCP to assist in the safety of navigation. Under the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (**STCW** 78/95) officers must use and understand IMO SMCP. They are phrases useful for all modern conditions at sea. There are two parts,

- ☐ the External Communication Phrases, e.g. meteorological warnings.
- ☐ the On-board Communication Phrases, e.g. Pilot on the bridge.

Glossary

navigation	theory and practice of navigating, directing the course of a ship
multilingual	using, speaking more than one language
assist	help, aid
convention	a formal agreement between countries
watchkeeping	being on duty aboard ship for a period of time (usually four hours)
on-board	carried or used aboard a vessel

– *Identifying Maritime English.*

Look at the Maritime English phrases in the box. How are they different from general English? Try to guess their meaning by matching them to their general English equivalent below. Discuss if it is a good idea to use standardized language for maritime communication and why.

The officer onboard says:

- My ETA is 15:00 UTC.
- M/T Trader: Tango Romeo Alfa Delta Echo Romeo
- Request: I require medical assistance.
- I have a list to port.

– I need doctor's help.

.....

– We will arrive at 3 pm.

.....

– I am leaning to the left side.
.....

– Tanker ship Trader: T-R-A-D-E-R.
.....

2. Spelling, Numbers and Call Signs

A. *International Maritime Alphabet: Listen and underline the stressed syllable.*

A	Alfa	N	November
B	Bravo	O	Oscar
C	Charlie	P	Papa
D	Delta	Q	Quebec
E	Echo	R	Romeo
F	Foxtrot	S	Sierra
G	Golf	T	Tango
H	Hotel	U	Uniform
I	India	V	Victor
J	Juliet	W	Whisky
K	Kilo	X	X-ray
L	Lima	Y	Yankee
M	Mike	Z	Zulu

B. *Listen and circle the name you hear.*

– ARVANITIS or ARVANITES
– BAILEY or BAILLEY
– PAPANIKOLAOU or PAPANICOLAOU
– YIANNIOTIS or GIANNIOTIS
– WHITE or WHYTE
– JACQUE or JACKUE
– FUIDIZI or FUIDIXI

- According to the IMO SMCP, ***we speak numbers in separate digits***, e.g. for 150.5 we say "One-five-zero point five". [Note that we use full numbers in wheel orders, e.g. we say "Fifteen" for 15 or "Twenty" for 20, etc. for rudder angles].
- When you send a **GMDSS** (Global Maritime Distress and Safety System) message, you spell the vessel's name (using the Maritime Alphabet) and say the **Call Sign** and **MMSI** (the 9-digit Maritime Mobile Service Identity Number) ***using separate digits***.

C. *Work in pairs to exchange vessel identification information.*

Student A: Dictate the information in your card to your partner (using the phrasing in the example). Then, check his/her own completed card to see if s/he got it right.

e.g.: For this information	You say:
Vessel's Name: ANTARES **MMSI: 257689000** **Call Sign: LAPW5**	**This is** **two-five-seven-six-eight-nine-zero-zero-zero,** **Motor Vessel "ANTARES" Alfa November Tango Alfa Romeo Echo Sierra,** **Call Sign Lima Alfa Papa Whisky Five**

Vessel's Name:	APOLLON HELLAS	SAEHAN BAYSTAR	ADOUR	SACAGAWEA
MMSI:	237002600	440983000	635005000	369855000
Call Sign:	SWFP	DSON9	FQEP	NSAC

Student B: Go to page 492. Listen to your partner and fill in your card. If you need, you can ask him/her to repeat: *e.g. Please, repeat the Name / MMSI / Call Sign.*

Car Carrier: A vessel carrying motor vehicles.

D. *Listen to a routine traffic operation exchange between Piraeus Traffic (Vessel Traffic Service) and a vessel. The structure of the communication is the following.*

VESSEL ➔ PIRAEUS TRAFFIC
PIRAEUS TRAFFIC ➔ VESSEL

a) ***Lead-in.*** To familiarize yourself with the way VHF communication sounds (since there can be different amounts of distortion in it), listen and circle **the phrases** you can hear:

Type of Cargo	Number of Officers	Vessel's capacity	Number of crew members	Number of passengers	MMSI number	Port of Call
Ship's Flag	Master's Name	Pilot Station	Call sign	Name of local agent	IMO number	ETA

b) Listen again and fill in the information in the box:

VESSEL'S NAME:	
CALL SIGN:	
SHIP'S FLAG:	
IMO NUMBER:	
LAST PORT OF CALL:	MUNDRA, INDIA
DESTINATION:	
NEXT PORT OF CALL:	
VESSEL COMING TO PILOT STATION:	☐ YES TIME: ☐ NO
NUMBER OF CREW MEMBERS ON BOARD:	
NUMBER OF PASSENGERS ON BOARD:	
AMOUNT OF CARGO:	_____ units _____ metric tonnes
TYPE OF CARGO:	

3. What's the time?

My ETA is 08:00 ("zero eight hundred hours")
Loading starts at 09:10 ("zero nine ten")
Loading finishes at 14:15 ("fourteen fifteen")
Vessel's ETD is 15:50 ("fifteen fifty")

– At sea we speak times using the 24-hour UTC (Universal Time Co-ordinated) notation.
– The digital 24-hour clock system helps us avoid confusion with a.m. (ante meridiem = before noon) and p.m. (post meridiem = after noon).

Instead of saying **3 p.m.** we write **1500** and say **fifteen hundred hours** or **one five zero zero hours**. Instead of saying **3 a.m.** we write **0300** and say **zero three hundred hours** or **zero three zero zero hours**.

A. *Complete the times.*

		you write	**you say**
1.	8.30 p.m.	2030	twenty thirty
2.	8.00 a.m.		
3.	7.05 p.m.		
4.	11.20 a.m.		
5.	2.00 p.m.		
6.	4.00 p.m.		
7.	12.15 p.m.		
8.	11.40 p.m.		
9.	1.55 p.m.		
10.	1.00 a.m.		

B. ***Listen and circle the phrase you hear.***

– 14.40 or 14.30
– 4th Engineer or 4 engineers
– 3rd Officer or Radio Officer
– 23rd or 23
– 14th or 40th
– the fifth vessel or the fiftieth vessel of the company

– 15.00 or 13.00
– 08.15 or 08.50
– 16th May or 6th May
– 17.30 or 19.30

4. Distress, Urgency and Safety Signals

A. ***Match the type of message to the situation it indicates and the signal we use to announce it.***

MESSAGE	SITUATION	SIGNAL
Distress	Serious danger to ship, crew or passengers	SÉCURITÉ
Urgency	Imminent risk for navigation	PAN PAN
Safety	Serious and immediate danger to ship, crew or passengers	MAYDAY

B. ***Listen and identify the type of message. Circle the correct one.***

– Message number 1 is **a distress** message
an urgency message
a safety message

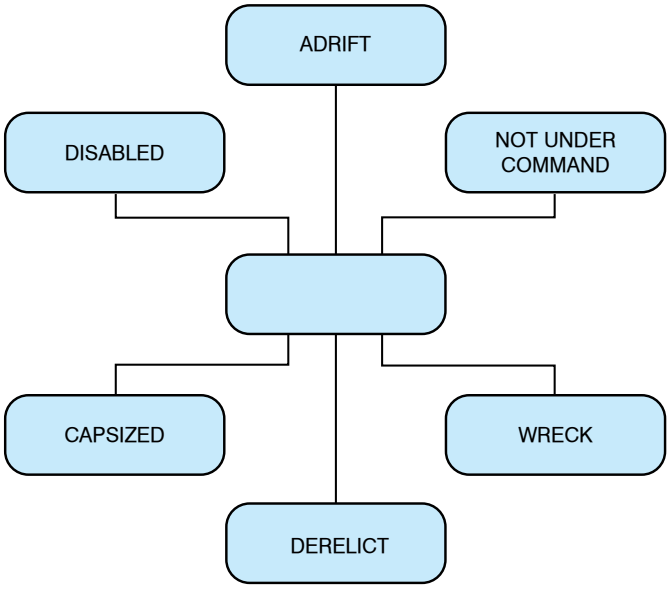
– Message number 2 is **a distress** message
an urgency message
a safety message

C. ***Listen to the first message again. What information can you hear in it? Tick [☑] the information the message contains.***

☐ The 9-digit MMSI number
☐ The call sign
☐ The name of the vessel calling
☐ The type of the vessel calling
☐ The position of the vessel
☐ The number of crewmembers on board
☐ The nature of distress
☐ The assistance required

D. ***What do the following terms have in common? Fill in the middle of the graph what the terms describe.***

1. types of messages
2. emergency situations on board
3. the condition the ship is in



5. PA announcements/Instructions on how to put on your lifejacket

The purpose of "Passenger Care" announcements is to
- inform passengers on safety aspects
- manage passengers in case of an emergency

A. ***Listen to the following PA announcements and tick ☑ accordingly.***

Announcement 1.
In case of emergency,
☐ passengers must obey the safety instructions given by the crew.
☐ passengers must listen to announcements given on the public address system.
☐ passengers must do what they have read in the notes and leaflets in their cabins.

Announcement 2.
The announcement
☐ informs passengers about the spaces on board they are not allowed to enter.
☐ gives instructions on how to enter special areas and compartments on board.
☐ informs passengers of how they can have access to their cars.

Announcement 3.
The announcement
☐ allocates passengers to their assembly stations.
☐ explains what the abandon ship alarm sounds like.
☐ informs passengers about evacuation and boat drills and gives instructions on how to put on their lifejackets.

B. ***The following pictures demonstrate how to put on your lifejacket. What is the main instruction for each picture? Choose one of the following verbs for each picture.***

tie in front – pull over – tighten

Now listen to Announcement 3 again and write instructions under each picture.

1. ..... 2. ..... 3. .....
....
....

6. Standard Wheel Orders (SMCP A2/1)

Lead-in: Words you need.

What do the following words mean? Match them to the correct definitions.

1. Helm	___ the person who steers a ship
2. Helmsman	___ a wheel for steering the ship
3. Steer	___ keep at a certain level, continue to follow (e.g. a course)
4. Swing	___ quickly
5. Rapidly	___ the direction the ship is moving toward
6. Hold	___ movement backward and forward or from side to side
7. Heading	___ control the movement of a ship and guide in a particular direction

I. Wheel / Helm Orders

a) Match the helm orders to their meaning. Write the correct helm order for each action. Then, in pairs, practise saying the orders by repeating them.

ORDER	MEANING
Midships	_____: 5° of port rudder to be held
Port five	**Steady**: reduce swing as rapidly as possible
Starboard ten	_____: reduce amount of rudder to 10° and hold
Starboard fifteen	_____: rudder to be held in the fore and aft position
Hard-a-port	_____: avoid allowing the vessel's head to go to starboard

Meet her	_____:	rudder to be held fully over to port
Steady	_____:	15° of starboard rudder to be held
Ease to ten	_____:	check the swing of the vessel's head in a turn
Steady as she goes	_____:	10° of starboard rudder to be held
Nothing to starboard	_____:	steer a steady course on the compass heading indicated at the time of the order

b) Listen to the helm orders and circle [a] or [b] accordingly.

1. When you hear this order, you must...
   a. reduce the amount of rudder and hold.
   b. hold rudder in the fore and aft position.

2. When you hear this order, you must...
   a. check the swing of the vessel's head in a turn.
   b. reduce the vessel's swing rapidly.

3. When you hear this order, you must...
   a. reduce the vessel's swing rapidly.
   b. reduce the amount of rudder and hold.

4. When you hear this order, you must...
   a. hold the rudder on steady course.
   b. reduce the amount of rudder and hold.

5. When you hear this order you must...
   a. reduce the vessel's swing rapidly.
   b. steer steady course on the compass heading.

II. Course to be steered by compass

- *All wheel orders given by the officer of the watch should be repeated by the helmsman.*
- *For the course to be steered by compass, first you say the direction in which the wheel is to be turned and then say the numbers (including zero) separately.*

e.g. (port) 180° A: "Port, steer one eight zero"
B: "Steady on one eight zero"

a) In pairs, give orders and repeat them using the example above.

Student A: Give the order for the course to be steered by compass.
Student B: Imagine you are the helmsman. Repeat the course.

Course to be steered:
1. (starboard) 094°
2. (port) 302°
3. (port) 158°
4. (starboard) 083°
5. (port) 125°

b) Listen to the helm order for the course to be steered by compass and circle the correct alternative.

1. The order tells you to steer **018 / 180 degrees, port / starboard** side.
2. The order tells you to steer **052 / 025 degrees, port / starboard** side.
3. The order tells you to steer **099 / 091 degrees, port / starboard** side.
4. The order tells you to steer **120 / 130 degrees, port / starboard** side.

7. Position; bearing; course; distance; speed; draught

A. *Match the examples to the headings. Choose from the box.*

Position: .....
Position related to a mark: .....
Bearing: .....
Relative bearing: .....
Course: .....
Distance: .....
Speed: .....
Draught: .....

Buoy 015° on your port bow.	7.2 meters	3 nautical miles	Our position bearing 130° from Angelohori lighthouse distance 3 nautical miles.
Pilot boat is bearing 210° from you.	56° 22' North, 021° 02.5' East	130 degrees	14 knots

B. *Listen to a briefing given by an officer before handing over the watch.*

What information can you hear?

a. Tick the display readings given in the briefing and then write the exact reading after each heading in the space provided:

☐ Position _____ ☐ Speed _____
☐ ETA _____ ☐ Draught _____
☐ Course _____ ☐ Under-keel clearance _____

b. What navigational aids are mentioned?

☐ Port radar ☐ Magnetic compass
☐ Starboard radar ☐ Gyro-compass
☐ Echo sounder ☐ Navtex
☐ GPS ☐ VHF DSC / DSC controller

8. Glossary

A. *Match the terms to the definitions.*

Adrift	NUC	Hampered	Underway	Capsized
Moored	Wreck	Derelict	Disabled	

	1. vessel turned over
	2. vessel secured by ropes or made fast to the shore or anchors
	3. vessel moving uncontrollably by current, tide or wind
	4. vessel still afloat, abandoned at sea
	5. vessel destroyed, sunk, or abandoned at sea
	6. vessel unable to manoeuvre as required by the COLREGs
	7. vessel damaged in such a manner as to be incapable of proceeding
	8. vessel not at anchor, or made fast to the shore or aground
	9. vessel restricted by her ability to manoeuvre by the nature of her work

B. *What do the following initials stand for?*

GMDSS: *Global* _____
SWL: *Safe* _____
CPA: *Closest* _____
EPIRB: *Emergency* _____
ETA: *Estimated* _____
RCC: *Rescue* _____
VTS: *Vessel* _____
TSS: *Traffic* _____

C. *Match the words to create correct collocations.*

call	signal	area	orders	pattern	alert
move	points	exercise	cargo	station	party

Cardinal _____	Distress _____
Rig _____	Fire _____
Ordnance _____	Lifeboat _____
Restricted _____	Roll _____
Standing _____	Search _____
Retreat _____	Shifting _____

D. ***Work with a study partner to group the following terms. First put the terms in the correct column. Then use them to fill in the gaps below.***

Segregation	Damage Control Team	Shifting	Abandon Vessel
Survivor	Leeward	OSC	Compatibility
Variable	Assembly Station	Foul	Initial Course
Dragging	IMO-class	Windward	Dredging
Veer out	PA-System	Casualty	Backing

SAR	CARGO	WIND	EMERGENCY ON BOARD	ANCHOR
1.	1.	1.	1.	1.
2.	2.	2.	2.	2.
3.	3.	3.	3.	3.
4.	4.	4.	4.	4.

WIND

- A wind is _____ when it is constantly changing speed and direction.
- The anticlockwise change of direction is called _____.
- To be on the sheltered side of the ship is called _____.
- To be on the direction from which the wind blows is called _____.

ANCHOR

- _____ of anchor is when the anchor has its own cable twisted around it.
- The movement of the anchor over the sea bottom to control the movement of the vessel is called _____ of anchor.
- The involuntary movement of the anchor over the sea bottom is called _____.
- To let out a greater length of cable is to _____ the anchors.

SAR

- The _____ is a person designated to co-ordinate search and rescue operations within a specified area.
- The course to be steered at the beginning of a search, directed by the On-Scene Co-ordinator or other authorised person is called_____.
- _____ is a case of death in an accident or shipping disaster.
- A _____ is a person who continues to live in spite of being in a shipping disaster.

EMERGENCY ON BOARD

- The _____ is a group of crew members trained for fighting flooding in the vessel.
- To _____ is to evacuate crew and passengers from a vessel following a distress.
- The place assigned to crew and passengers where they meet according to the muster list when they hear the corresponding alarm or announcement is the _____.
- _____ are the loudspeakers in the vessel's accommodation or on deck through which announcements are made.

CARGO

- The separation of goods which for different reasons must not be stowed together is called _____.
- _____ indicates whether different goods can be safely stowed together in one cargo space.
- The group of dangerous or hazardous goods, harmful substances or marine pollutants in sea transport as classified in the IMDG Code is referred to as _____.
- The transverse movement of cargo, especially bulk cargo, caused by rolling or a heavy list is called cargo _____.

E. *Write a key word for each term.*

main engine loudspeaker tank cleaning death pollution flooding radar helicopter cable GMDSS system whistle

1. PA-system – .....
2. Spill control – .....
3. Casualty – .....
4. Blind sector – .....
5. Damage control – .....
6. Digital Selective Calling – .....
7. COW (Crude Oil Washing) – .....
8. Crash-stop – .....
9. Blast – .....
10. Hoist – .....

F. *Write the correct derivative of the words in capital letters.*

1. Passengers must go to their assembly stations when they hear the corresponding _____ .	**ANNOUNCE**
2. When a piece of equipment is not functioning, we say it is _____.	**OPERATE**
3. When some equipment is ready for immediate use, it is _____.	**OPERATE**
4. The _____ gas produced by chemicals, fires, fuel, etc. are called "fumes".	**HARM**
5. "To inert" is to reduce the oxygen in a tank by inert gas to avoid an _____ atmosphere.	**EXPLODE**

6. When the _____ of a radio station have broken down, switched off or suspended, the station is "off air".	**TRANSMIT**
7. The maximum _____ pressure in cargo hoses is called Safe Working Pressure.	**PERMIT**

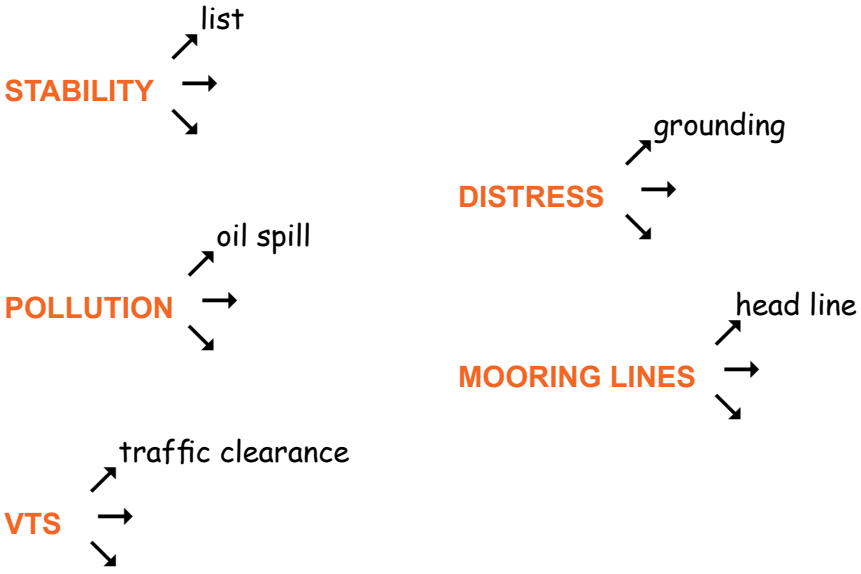
G. *Match the terms to their definitions.*

Traffic clearance	Refloat	Fairway	Stand clear	Jettison
Boarding Arrangements	Proceed	Foul	Launch	Waypoint
Off station	Let go	Spill	Operational	Transit

	1. Navigable part of a waterway.
	2. The anchor has its own cable twisted around it.
	3. The accidental escape of oil into the sea.
	4. All gear necessary for the safe transfer of the pilot.
	5. VTS authorisation for a vessel to proceed under conditions specified.
	6. To pull a vessel off after grounding.
	7. To lower, e.g. lifeboats, to the water.
	8. To continue with the voyage or sail for a certain direction.
	9. Ready for immediate use.
	10. To set free or cast off lines, anchors etc.
	11. To throw goods overboard in order to lighten the vessel or improve its stability.
	12. A buoy not at the position charted.
	13. A mark or position at which a vessel is required to report to establish its position.
	14. To keep a boat away from a vessel.
	15. The passage of a vessel through a canal, fairway, etc.

H. *Match the following.*

reference line	~~list~~	jettison	~~head line~~	collision
breast line	receiving point	forward spring	capsize	oil clearance
~~oil spill~~	polluter	~~grounding~~	sinking	~~traffic clearance~~



I. *Choose the correct alternative.*

1. A space in a vessel where, for safety reasons, entry is only permitted for authorized crew members is a _____ area.
   a. forbidden *b. restricted* *c. limited*

2. When the light of a buoy or a lighthouse is inoperative, it is _____.
   a. dark *b. off* *c. unlit*

3. The position a vessel has to pass according to her voyage plan is called _____.
   a. passing point *b. route point* *c. waypoint*

4. The speed of a vessel required for passage through a canal, fairway, etc is called _____ speed.
   a. transit *b. transfer* *c. travel*

5. The final pumping of a tank's residues is called _____.
   a. stripping *b. draining* *c. clearing*

6. The sound, visual or other signal to a team ordering it to return to its base is called _____ signal.
   a. retreat *b. withdrawal* *c. exit*

7. The escape of liquids (water, oil, etc.) out of pipes, boilers, tanks, etc., or a minor inflow of seawater into the vessel due to damage to the hull is called _____.
   a. flooding *b. spill* *c. leaking*

8. North, east, south and west, are called _____ points of the compass.
   a. basic *b. principal* *c. cardinal*

9. A group of crew members trained for fighting fire on board is called _____.
   a. fire patrol *b. fire party* *c. fire group*

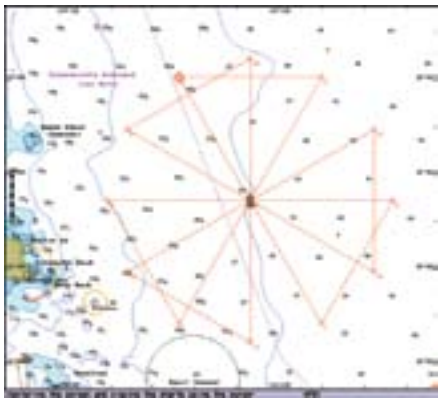
10. When attending a vessel in case of need, an icebreaker, tug, etc. is _____ her.
    a. going after *b. escorting* *c. accompanying*

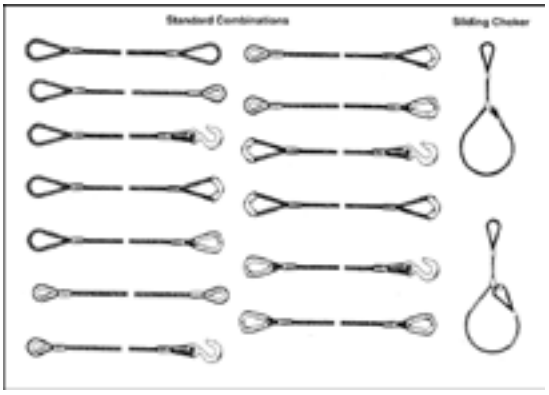
J. *Choose the correct alternative.*

1. To decrease the distance to the vessel ahead by increasing your own speed is to *close up / drop back / stand clear*.
2. To increase the distance from the vessel ahead by reducing your own speed is to *close up / drop back / keep back*.
3. To set free or cast off anchors, lines, etc. is to *let out / let off / let go*.
4. To pull a vessel off after grounding is to *refloat / drift / proceed*.
5. To keep a boat away from the vessel is to *keep clear / stand clear / keep away*.
6. To keep out of the way of another vessel is to *give way / give out / get away*.
7. To maintain course and speed is to *stand in / stand on / stay on*.
8. To sail or head for a certain position or to continue with the voyage is to *proceed / approach / move forward*.
9. To pick up shipwrecked persons is to *regain / retrieve / recover* them.
10. To be in readiness or prepared to execute an order is to *stand in / stand by / stand clear*.
11. To reverse the action of a windlass to ease the cable of the anchor is to *walk back / walk off / walk on*.
12. To regulate the motion of a cable, rope, etc. when it is running out too fast is to *check up / check / stop up*.

K. *Write a title under each picture. Then say what is the use of each thing shown in the pictures.*

1. Mooring winch
2. Targets (on a radar screen)
3. Traffic Lanes in a Traffic Separation Scheme
4. Anchor
5. Search Pattern
6. Bollard
7. Anchor Chain
8. Bow Ramp
9. Capstan and Windlass
10. Slings
11. Bob-cat
12. Double Bitt




Standard Combinations
Sliding Choker

Round-up

A. Vocabulary Consolidation Self-Assessment.

Tick ☑ what you can do. Cross ☒ what you still find hard to do in English.

☐ ☐ Dictate and note ship's call signs and messages using the international maritime alphabet.
☐ ☐ Give and receive information that contains times.
☐ ☐ Understand SMCP signals.
☐ ☐ Repeat and understand helm orders.
☐ ☐ Say vessel's position, bearing, course, speed, draught.

B. Work in pairs to dictate and note down information.

Student A: Ask your partner the following questions. Fill in your card.

- What is the date?
- What is your ETA?
- What time does loading start?
- Who is the officer in charge?
- How much cargo do you expect to load?

	A	B	C
Date:			
ETA:			
Loading starts:			
Cargo:			
Officer in charge:			

Student B: Go to page 492. Dictate the information from the card to your partner. Check if s/he notes it down correctly.

UNIT 2

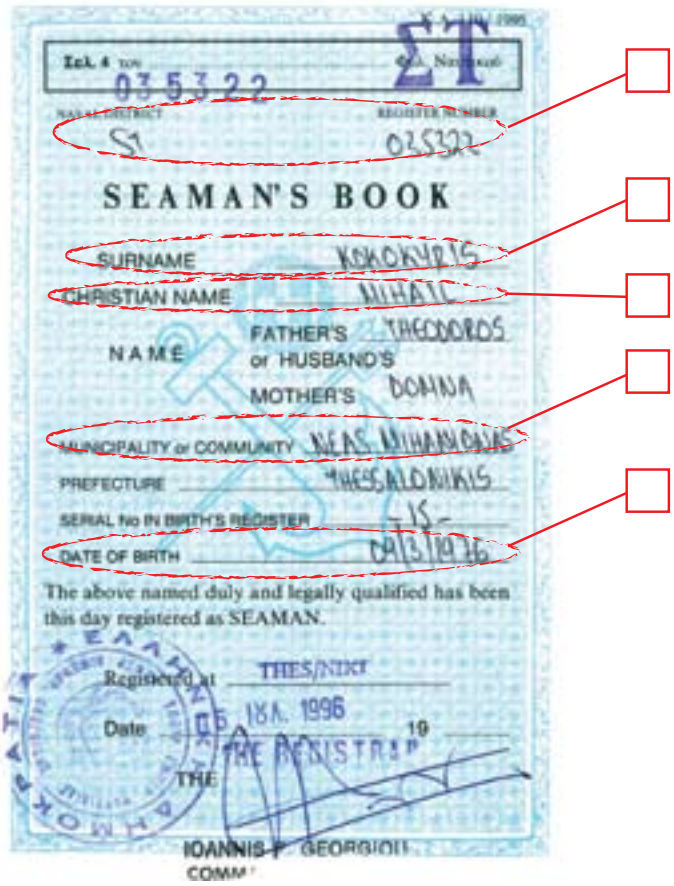
The Seafarer

1. *Welcome on board. What is your seaman's book number?*
2. *Personal Information / Cadet Application Form*
3. *Merchant marine deck officer: Job profile*
4. *Ranks and roles: Officers*
5. *Ranks and roles: Duties of deck/ engineer cadets*
6. *Ranks and roles: Ratings*

Round-up

1. Welcome on board. What is your seaman's book number?

A. ***Listen to five numbered questions. Match the correct number to the highlighted information in the seaman's book.***



B. ***Listen to the dialogue. The Captain meets the Second Engineer. Answer the questions.***

– Where is the 2nd Engineer from?

– How old is he?

– Is he married?

C. ***The Captain says...***

…. There are four more Greek crew members on board. Greek seafarers have a good reputation….
…. First we have a period of familiarisation; you must become familiar with the vessel and especially its safety equipment….

Glossary

crew	personnel serving aboard a ship
ship familiarization	knowing the ship, becoming familiar with it
seafarer	somebody who works at sea

2. Personal Information / Cadet Application Form

A. ***Listen to these two seafarers. They are talking about themselves. Complete the forms about them.***

AGE:
NATIONALITY:
RANK:
NAME OF VESSEL:
MARRIED?
CHILDREN?

AGE:
NATIONALITY:
RANK:
NAME OF VESSEL:
MARRIED?
CHILDREN?

B. ***Talk to your study partner about the two seafarers.***

This is Fiona. She is …….
This is Yiannis ……

C. ***Listen to the dialogue. The crew manager is talking to the Captain. Circle the correct information from the words in blue.***

NAME	RANK	NATIONALITY	AGE
PAREZ, Manuel	Bosun	Italian / Peruvian	33 / 43
VOLDUNI, Tony	Assistant / Chief Engineer	Italian / Korean	40 / 50
HAZEVELD, Henrik	Chief / Second Mate	Dutch / Swiss	27 / 37
GOLDSMITH, Jerry	Deck / Engineer Cadet	French	19
KAPLAN, Carrie	Deck / Engineer Cadet	French	21

Glossary

port of call — a place where a ship stops on a voyage (to un/load, get supplies etc.)

crew list — list prepared by the master of a ship showing the full name, nationality, passport or discharge book number, rank and age of every officer and crew member engaged on board that ship

D. ***A new crewmember arrives on board. Listen to the dialogue and circle a, b, or c.***

1. *This is a dialogue between*
   - *a.* The Chief Mate and the new AB
   - *b.* The Chief Mate and the new OS
   - *c.* The Chief Engineer and the new Cadet

2. *The new crewmember's seaman's book number is*
   - *a.* B 452198 *b.* D 452158 *c.* P 452188

3. *The new crewmember's family name is*
   - *a.* PARKIN *b.* PARKER *c.* PARCER

4. *The new crewmember is*
   - *a.* Australian *b.* American *c.* Canadian

5. *The new crewmember is*
   - *a.* married *b.* single *c.* divorced

6. *Who has the same nationality as the new crewmember on board?*
   - *a.* the Chief Mate *b.* the Cook *c.* the Cadet

7. *The new crewmember's date of birth is*
   - *a.* 12th July 1979 *b.* 20th July 1979 *c.* 20th July 1989

8. *The vessel the new crewmember worked before was a*
   a. Ro-Ro *b.* Dry Bulk Carrier *c.* Reefer

9. *The new crewmember must now go to*
   a. the ratings' smoking room
   b. the officers' messroom
   c. the ratings' messroom

10. *The new crewmember will take orders from*
    a. the Captain *b.* the Chief Mate *c.* the Bosun

E. ***Fill in the application form about yourself.***

CADET APPLICATION FORM	
Application for appointment as:	
Deck Cadet ☐	Engineer Cadet ☐
Personal Details	
Surname	
Forename	
Gender Male ☐	Female ☐
Age	Nationality
Date of Birth	Place of Birth
Contact Details	
Telephone number	
E-mail address	
Current address	

3. Merchant marine deck officer: Job profile

A. *Reading Comprehension: Careers Advice Information.*

a) The following text answers five basic questions asked by someone who wants to have a career as a Merchant Marine Deck Officer. Use the questions below (in red letters) to fill them in the correct part of the text.

b) There are five sentences missing in the text. Fill in the green gaps with the sentences (A-E) below. Write the correct letter (A-E) in the blanks.

What are the hours and working conditions? What opportunities are there? What is the work like? What salary and other benefits can I expect? What skills and knowledge do I need?	A. On a large vessel, you would work four hours on duty followed by eight hours off. B. Your employer would pay for food and accommodation whilst at sea, and for some travel costs when onshore. C. Good spoken and written communication skills D. You would have full responsibility for the overall running and safety of the ship, crew (ratings), passengers and cargo. E. You would be responsible for navigation, using radar, satellite and computer systems.

Merchant Marine Deck Officer

1. _____?

Merchant marine deck officers work aboard container vessels, bulk carriers, tankers, cruise liners and ferries. They help to manage a ship's navigation, communications, crew and cargo. They also look after passengers on ships and take part in onboard social events.

As a deck officer, you would work at one of four levels, depending on your experience:

- Master (Captain) – _____ You would handle legal and commercial matters and keep all the ship's records up to date.
- Chief Officer – you would assist the Master and oversee deck operations and maintenance, cargo handling and storage. You would also manage work schedules and supervise other officers.
- Second Officer – _____ You would also monitor the vessel's position, speed, direction and weather reports, and carry out watch duties at sea and in port.
- Third Officer – this would usually be your first post after training, dealing with the ship's safety equipment and lifeboats. You would assist the Second Officer and carry out watch duties.

2. _____?

- Cadet trainees' salaries are around €1,000 per month of service.
- Qualified junior deck officers earn between €3,500 and €4,500 a month.

- Experienced officers earn from €6,000 to over €8,000, depending on rank.
- _____ *Figures are intended as a guideline only.*

3. _____?

Merchant Navy vessels operate around the clock and you would work shifts, known as 'watches', that vary according to the size of your ship. _____

Your time at sea could vary from a few days or weeks to several months. Periods of leave between voyages would also vary.

You would work on deck, below deck and on the bridge, in all weather conditions.

4. _____?

- a confident approach and the ability to inspire confidence in others.
- an interest and understanding of the latest vessel technology.
- the ability to cope with being away from home for long periods of time.
- good teamworking skills.
- excellent maths skills for navigational calculations.
- _____
- the ability to deal with emergencies in a calm and controlled manner.
- enthusiasm and self-belief.

5. _____?

According to economic forecasts, there will be a considerable increase in seaborne trade over the coming years.

You could find both onshore and offshore positions with shipping companies, port authorities, maritime insurance companies and shipping brokers.

B. *Listening Comprehension: the Maritime Profession and the EU.*

The Vice-President of the European Commision in charge of Transport, Jacques Barrot, gave a speech[1] on an event organized by the Hellenic Chamber of Shipping. Listen to a report of his speech and do the following exercises.

i. What is the *main* point of the report that EU Transport officials are interested in?

a) The fleet controlled by Greek interests is the biggest in the world.

b) It is important to attract young people to the maritime profession because there is a lack of European officers.

c) Maritime Safety will suffer and decline because of a shortage of European professionals in the field.

ii. Fill in the numbers:

a) This is a speech given on Hellenic Maritime Day _____, and it is concerned with European shipping in the _____ century.

b) The tonnage under the Greek flag represents _____ of total EU flagged tonnage. More than _____ ships are under construction for Greek owners.

c) In the speech, we also hear about the _____ Maritime Safety package proposed by the Commision.

1. The full text of the speech (J. Barrot's participation in the Hellenic Maritime Day, Athens, 30 March 2007) can be found in http://ec.europa.eu/ellada/pdf/jbarrothellenicmaritimeday300307.doc

4. Ranks and roles: Officers

A. ***Lead-in. Listen to the seafarers. What is their rank? Choose one of the following.***

Chief Engineer / Chief Officer / Master / Chief Cook / Cadet Engineer

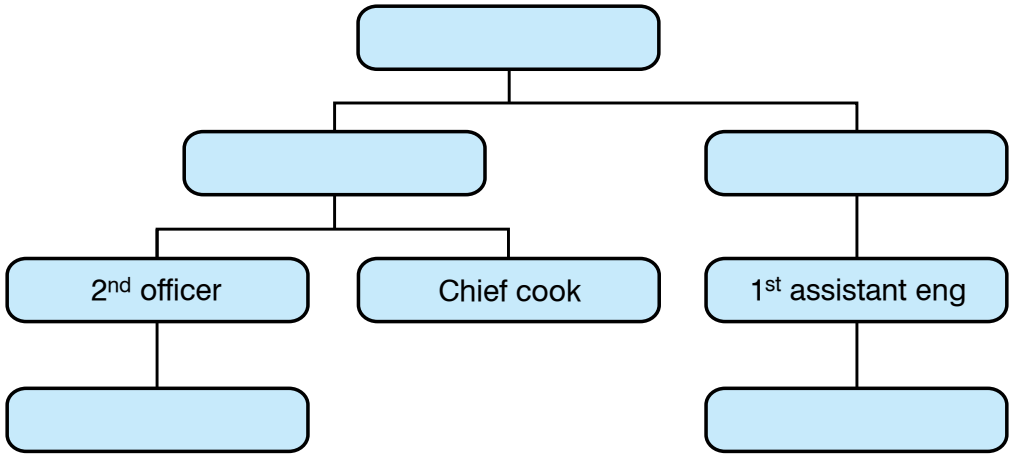
Speaker 1_____

Speaker 2_____

Speaker 3_____

B. ***Write the jobs in the correct position on the diagram.***

Chief Engineer	Master	3rd Officer
Chief Officer	2nd Assistant Engineer	



Read about the activities of the various officers on board. Remember, the role and responsibilities of officers varies, depending on the country, the flag, the type of ship, etc.

So, you want to go to sea... Look at the following maritime jobs:

– The Master

On most legal documents in the merchant shipping industry, the captain is referred to as the ship's Master. The Master of a merchant vessel is the representative of the company that owns a ship and s/he makes sure that the vessel is legal according to local, international and company regulations. S/he deals with all shore and port officials and is responsible for the well being of the crew and the safety of the ship. The Master also maintains discipline and pays the crew.

– Chief Mate (C/M) or Chief Officer (C/O)

S/he is the head of the deck department and is in charge of the ship's cargo and deck crew. S/he is responsible for the loading and discharging of the vessel as well as for fire-fighting drills

and boat drills. This means s/he supervises the Bosun, 2nd and 3rd Mates for cargo, maintenance, repairs and drills. S/he normally stands a navigational watch (4-8) and a cargo watch. S/he is typically the ship's Damage Control Officer, Safety Officer and Training Officer; this means that s/he has to make sure that the station bill and the muster bill are properly prepared and posted and that the fire-fighting equipment and the life-saving equipment are accessible and operational.

– Second Mate (2/M) or Second Officer (2(nd)/ O)

S/he is responsible for all aspects of navigation (voyage planning, chart correction, navigation equipment) while at sea, and is in charge of a cargo watch while in port. S/he is often designated Medical Officer and GMDSS operator, in charge of maintaining distress signaling equipment. S/he usually stands the 12-4 navigational watch and is responsible for the upkeep of onboard publications. On oil tankers the Second Mate assists the Chief Mate with tank cleaning operations.

- ***Navigational officer:*** the role of the navigational officer is to make sure that bridge electronics, navigational and alarm systems, and ship's lights are in good working order. S/he regularly checks bridge instruments and makes sure that up-to-date charts and navigational publications are available on board. S/he plots the voyage track and works out the course.

– Third Mate (3/M) or Third Officer (3(rd)/ O)

S/he is responsible for all safety inspections and the upkeep of all Life Sa-ving Appliances and Fire Fighting Equipment on board. S/he usually stands the 8-12 navigational watch while at sea, and is, sometimes, appointed ship's Safety Officer.

- ***Safety Officer:*** the duties related to the role of safety officer focus on responsibility for items such as firefighting equipment, lifeboats, and various other emergency systems.

– Chief Engineer (C/E)

A day worker, s/he is in charge of the engine department and is responsible for E/R personnel and the proper operation, overhauling, and safety of the vessel's propulsion system, power generation system and all auxiliary machinery and spaces.

- Responsible for ordering spare parts.
- Supervises critical engine repairs.

On bridge: Officer charting route / helmsman steering.

Inspecting and repairing generator.

- Decides on repairs and reports defects that may affect the ship's performance to the Master.
- Advises the Master on all matters relating to fuel requirements.
- Logs fuel consumption.

– Second Engineer (or 1st Assistant Engineer, in some countries)

S/he keeps an E/R watch and reports directly to the Chief Engineer about the daily maintenance and operation of the engine department.

- Is in charge of engine room repairs.
- Allocates daily duties to E/R officers and crew.
- Keeps overtime records.

– Third Engineer (or 2nd Assistant Engineer)

S/he keeps an E/R watch and is responsible for the smooth operation of all engine room systems.

- Performs system checks.
- Normally in charge of electrical systems, generators, boilers, fuel, auxiliary engines and feed systems.
- Is typically in charge of bunkering, if the officer holds a valid Person In Charge (PIC) endorsement for fuel transfer operations.
- supervises tank soundings, monitors boiler room equipment.

– Chief Cook

S/he creates daily menus, orders and stocks sufficient amounts of food, cooks, bakes, and prepares food.

Glossary

representative	acting, serving as agent
regulations	body of rules
supervise	direct and watch over the work and performance of others, oversee
operational	ready for immediate use
designated	appointed, assigned as, selected for a duty or a specified purpose or role * e.g. DPA, Designated Person Ashore, for Safety Management
upkeep	maintenance, in proper operation, condition and repair
proper	suitable, appropriate, correct, fitting
overhaul	check carefully and make any necessary repairs
critical	so serious as to be at a point of crisis
defect	deficiency, imperfection, flaw
overtime	time somebody works beyond normal working hours, payment for additional work done outside the regular schedule
smooth	without difficulties, obstructions or irregularities, note the saying "A smooth sea never made a skilled mariner"
valid	legally sufficient and authorized by law
endorsement	official approval, authorisation
sufficient	enough, adequate

C. *Fill in the correct prepositions.*

1. Responsible _____ safety.
2. He is ____ charge _____.
3. She is ____ command _____.
4. The head _____ the engine department.
5. I am ____ duty.

D. *Fill in the correct verb to make phrases.*

chart / correct / report to / perform / steer / stand / complete

1. _____ a navigational watch.
2. _____ paper work, forms, documents.
3. _____ checks on engine systems.
4. _____ the chief engineer.
5. _____ the vessel.
6. _____ the charts.
7. _____ the route.

E. *Listen to two interviews with deck cadets and fill in the information you hear. Leave the box blank when you don't hear any relevant information[2].*

	Interview 1	Interview 2
Name of vessel:		
Type of vessel:		
Cargo:		
Year built:		
Trading Area:		
LOA (length overall):		
Breadth:		
Number & nationality of Second Officers onboard:		
Number & nationality of Third Officers onboard:		
Roles of Second Officers:	**Designated as:**	**Designated as:**
C/O designated as:		

2. The interviews are authentic and spontaneous, and, since the cadets are non-native speakers/learners of English, there might be some minor grammar errors in them. Such minor errors do not actually disrupt natural oral communication, so don't pay attention to them.

Designated Safety Officers

STANDING ORDER: No1
M/V FAITH

PIRAEUS / 11026

Responsible Persons for Safety Maintenance

G..... MENELAOS, Chief Officer:

Overall responsible for Safety Maintenance. Oversees the 2nd Officers in their area of responsibility.

T..... ANTONIOS, 2nd Engineer

Chief Officer's substitute, responsible for Safety Maintenance.

S..... ELEFTHERIOS, 2nd Officer :

Responsible for the Life Boats, Life Saving Equipment and Bridge Equipment.

S..... MANOLIS, 2nd Officer :

Responsible for Fire Fighting Equipment in general, ventilation dampers, operational condition and maintenance.

The 2nd officers are fully responsible to undertake their duties every week, in their specific areas of responsibility, without waiting for specific instructions from the Chief Officer or 2nd Engineer. Every Saturday they will report to the master the work/checks done during the previous week, and bring the Maintenance Record Book for signing.
In areas or items where they need help or instructions they are to ask the Chief Officer's assistance.

AT YANTAI 22-06-2015

The Master of M/V FAITH

Capt. K..... ATHANASIOS

Designated GMDSS Operator

STANDING ORDER: No2
M/V FAITH

PIRAEUS / 11026

Responsible General Operator

The 2nd Officer S..... MANOLIS, who is holder of the G.O. certificate, is hereby assigned as General Operator of the vessel, to have primary responsibility for radio communications during distress incidents, to perform the routine communications and tests, maintain the equipment, process telecommunication charges, write the relevant Radio Log book and in general and in all respects carry out his duties as necessary for the proper operation of the G.M.D.S.S. system and the fulfilment of the vessel's national and international responsibilities as defined in the relevant laws and regulations. In his duties and as necessary, he is to be assisted by the other deck officers holding General Operation Certification.

AT YANTAI 22-06-2015

The Master of M/V FAITH

_____

Capt. K..... ATHANASIOS

5. Ranks and roles: Duties of deck/engineer cadets

A. *"My Life at Sea"*

a) Lead-in. Look at the pictures and match them to the following titles.

Fire drill	Abandon ship drill	Drill review meeting	Lifeboat release hook

(a) 

(b) 

(c) 

(d) 

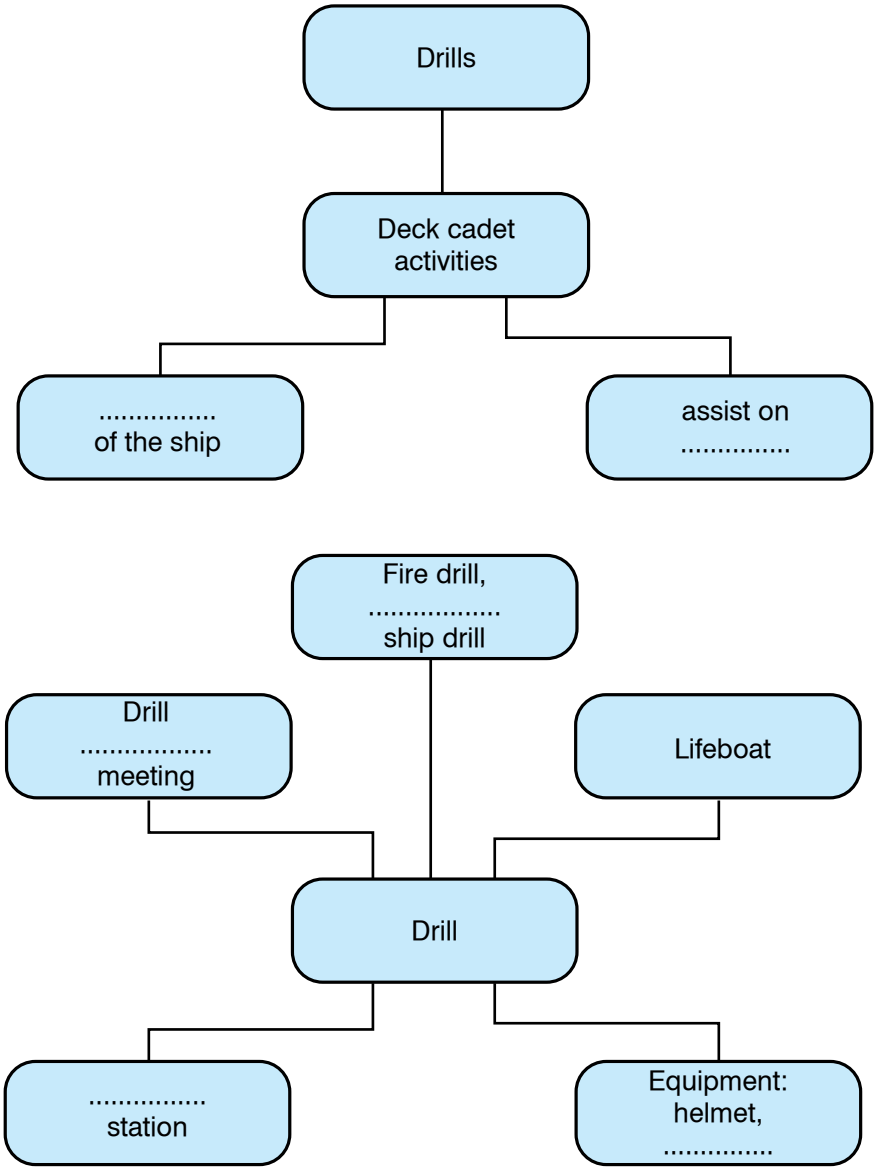
b) Read the following entry to a blog site with the title "My life at sea". Then complete the word webs.

This is my first experience on a merchant vessel. I study Nautical Studies and my curriculum requires seagoing service for a period of 12 months. I will be on board M/V Aurora Leigh for 6 months. I live and work with an international crew, speaking English 24 hours a day. I enjoy my work on board and look with anticipation into the next weeks on board the vessel.

What are the duties of a deck cadet on board? There are two parts in my working day. First I assist on the bridge; and the other part of my activities has to do with the maintenance of the ship.

Every week there are fire drills and abandon ship drills. I have my station bill card where I read what my duties are in emergency situations. Equipped with helmet and life jacket, I go to the muster station. After every fire drill we have an abandon ship drill. During this drill everybody learns how to use the lifeboats, start the engine and use the release hook. Afterwards everybody meets on the

bridge for a review of the performed drills. In this meeting we discuss all positive and negative aspects. Every crew member has the opportunity to suggest ideas to make the drills safer and more effective.



Glossary

curriculum	all the courses of study offered by an educational institution
anticipation	looking forward with eagerness, expectation
station bill	a list showing the stations of a ship's crew in emergencies
performed	completed, carried out
effective	producing the desired effect, productive

B. ***Listen to an interview about the various duties of engine cadets (sometimes also called apprentice engineers) and tick the phrases you can hear.***

The engineer cadet…

- ☐ Follows commands of officers in E/R
- ☐ Assists as required
- ☐ Takes part in overhaulings
- ☐ Takes part in inspections
- ☐ Carries stores
- ☐ Keeps the PMS (Planned Maintenance System) informed
- ☐ Must do some cleaning
- ☐ Supervises the oiler and the wiper
- ☐ Must learn the cargo operation
- ☐ Learns about the E/R operation as an Unmanned Machinery Space (UMS)
- ☐ Learns about bunkering and sampling
- ☐ Uses LSA (Life Saving Appliances)
- ☐ Learns how to give First Aid
- ☐ Discusses the daily works with captain
- ☐ Reports to captain about inspections
- ☐ Is responsible for discharging fuel

C. ***Listen again and fill in the blanks, based on the information you can hear in the interview. The first letter of each missing word is given.***

1. Overhauling is when you open up a machinery, take out its parts and r_____ them to keep it working properly, after a certain amount of working hours.
2. You do overhaulings in machinery such as a diesel g_____, fuel oil purifier or fuel oil high pressure pump.
3. You must learn how to operate the cargo oil pump turbine to discharge fuel to the s_____ connection.
4. You normally work 8 hours and then rest in your cabin, but when a problem is caused you need to work o_____.
5. Extra time is added to your normal hours when you are on stand-by before a terminal or sea passage, or for a special job, such as p_____ overhauling, which takes around 8 hours.

Overhauling piston no. 2.

6. The Chief Engineer sends information to the company about fuel c_____ and the PMS.
7. Every morning the Second Engineer gives the o_____ to Third Engineers, the oiler, the wiper and the cadet, divides the overhaulings and the cleanings, and reports to the Chief Engineer.
8. The cadet must know all the valves we open and the p_____ we use for bunkering.
9. You take the fuel samples and send them to a chemical lab to check if there is w_____ or contaminants.
10. Special ratings, such as technicians, come to do a special overhauling, such as r_____ of Main Engine turbo charger.
11. The fitter does all the welding for the pipes, if they must be replaced because they have h_____ due to corrosion.

D. ***Listen to two interviews about the various activities of deck cadets (also called apprentice deck officers). Tick the activities you hear. Then put them in the correct list.***

- ☐ Greasing moving parts
- ☐ Observing the Officers during their watch
- ☐ Participating in manoeuvring
- ☐ Correcting charts
- ☐ Chipping rust off with (electric) chipping hammer
- ☐ Filling in documents and passage plans
- ☐ Sweeping and mopping the floor
- ☐ Updating logbooks
- ☐ Cleaning up tanks
- ☐ Cleaning manifolds and pipes

Working on bridge	Working on deck

Updating logbooks.

Using the sextant to take observations.

E. ***Fill in the blanks, based on what you could hear in the two interviews.***

A cadet normally works _____ hours on deck and _____ hours on bridge, but s/he works mostly on the bridge if there are extreme_____ conditions.

Depending on his nationality, the _____ is sometimes responsible for the deck cadet's duties on deck.

You have too much work on deck, if the vessel is _____.

6. Ranks and roles: Ratings

There are three major departments on board a merchant ship: Deck, Engine and Catering Department.

A. ***Fill in the correct heading to describe the responsibilities of ratings in the three departments. Then, use the words in the box and put the ratings in the correct department.***

– Engine room ratings
– Catering ratings
– Deck ratings

_____	_____	_____
are responsible for cleaning, sweeping, chipping, polishing, etc. They help in loading and unloading of cargo and in port they assist in the mooring of the ship.	are responsible for the day to day cleanliness of the E/R and for the routine oiling, greasing and servicing of machinery. They help the officers monitor and ensure the safe running of main plant and auxiliary equipment.	clean accommodation areas and public rooms, help in preparation of food, clean galleys and cooking utensils, maintain fridges and freezers. They also serve meals to officers and crew and help in loading and storing of food.
↓	↓	↓
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

Wiper	A/B (Able Bodied Seaman)	Steward
Messmate	2nd cook (assistant cook)	Oiler
Bosun (boatswain)	Fitter	O/S (Ordinary Seaman)

B. ***The ratings speak about their duties. Complete the ratings (from the box on the previous page) next to their duties.***

_____: I clean the galley, the mess and keep the living spaces on board tidy. I serve meals to officers and crew.

_____: I am responsible for cleaning various engine spaces. I wipe down machinery and keep it clean. I am also a general handyman in the E/R, and assist officers.

_____: I make rounds in the E/R and assist as directed by the officers. I am senior only to the wiper. My job is to oil and grease bearings and moving parts of the main engine and auxiliaries. Most of this work is now done automatically, of course, so I basically make sure this operation runs correctly.

_____: I prepare and cook food.

_____: I supervise all A/Bs during deck maintenance and repair. I usually work during the day. I am in charge of all deck ratings and answer directly to the Chief Officer.

_____: My work is similar to that of the A/B, but I do no steering, and I concentrate more on cleaning. I still need sea time and additional qualifications before becoming an A/B.

_____: I clean the officers' rooms and the galley area, I set tables, etc.

_____: My work on deck involves chipping rust, painting, lubricating fittings, cleaning various areas. I also stand a watch under the supervision of the OOW and I am responsible for keeping a lookout and steering the vessel. I am a fully-trained seaman, with good knowledge of all deck gear and equipment. I carry out maintenance of deck rigging and machinery, such as the loading gear, cranes, ramps, doors, lifts and hoses, and the mooring equipment, such as the windlass, anchors, cables, wires and hawsers. The deck hands help me clean, chip, scrape, wirebrush, prime and paint the hull, bulkheads, decks, passageways, deck machinery or spaces.

_____: I do sheet-metal work, welding and plumbing. I fabricate and install steel pipe work, which means that I do the measurement, preparation and installation of pipe work of varying lengths and diameters.

– Qualified Members of the Engine Department (QMEDs) are trained in all crafts necessary to engine maintenance, welding, refrigeration, lathe operation, electricity, pumping, water purification, oiling, evaluating engine gauges.
– The pumpman takes care of the pumps of an oil tanker - operates pumps and discharges petroleum products.
– The A/B stands a watch when the ship is underway as "helmsman" (or "quartermaster") and steers the ship under the direct orders of the deck officers. This means he has to understand steering commands and have certain knowledge of nautical terms, Rules of the Road, fog and distress signals, running lights, the compass, etc.

Glossary

handyman	a worker skilled in various odd jobs or other small tasks
senior	of higher rank (compare to "junior": lower in rank)

prime	to prepare a surface for painting by covering with primer or an undercoat
hawser	thick rope or cable used for mooring or towing the ship
underway	a vessel in motion, not at anchor, or made fast to the shore, or aground
Rules of the Road	Collision Regulations (COLREGs)

Round-up

A. Vocabulary Consolidation Self-Assessment.

In this chapter you practised vocabulary on the following topics; tick (✓) the topics which you feel confident you can use English to express yourself on, and give four key words for each topic.

___ Fill in a cadet application form

___ Exchange personal information / Introduce yourself

___ Talk about routine activities on board.

___ Describe key responsibilities of all crew members.

B. Class Project.

Find information on, discuss with the captains teaching in your academy, and present in class one of the following:

- *Bring to class a seafarer job application form from a shipping company or the web. Fill it in with the rest of the class. Act out an interview between the crew manager and yourself, with questions and answers on basic personal information.*
- *Check the information in a Seaman's Book and present it in class; you need to translate words and talk about **each enlistment / certificate / licence / registration port / rates / reasons for discharge**. Also, borrow a seaman's book from someone with long sea service and see how it looks when it is completed.*
- *Find information about two relatively new roles onboard, the Environmental Officer, responsible for Garbage Management Plan, and the Ship's Security Officer, according to Ship Security Plan. Who is appointed in these roles? If you have access to vessel's documents, ask for MASTER'S STANDING ORDERS, like the ones on page 44, and bring to class documents appointing Officers to their duties.*
- *Some ranks have disappeared or have been replaced by others, like the "radio officer" or the "donkey man". Find out what they are and tell the class.*

C. Circle the correct word.

1. IMO: International **Maritime / Mariner** Organisation.
2. SMCP : Standard Marine **Communication / Co-operation** Phrases.
3. My first days onboard are for **familiarization / appointment.**
4. I study at the Merchant Marine Academy to become a **sailor / seafarer**.

5. Do you have your **seaman's / mariner's** book?
6. Shipping terms are part of **Maritime / Naval** English.
7. My **permanent / standard** address is in Preveza.
8. Sea crews are **multimedia** / **multilingual**.

D. Fill in the gaps with the words in the box.

watchkeeping	cadet	industry
chief	fleet	officer

1. The Greek merchant _____ is a commercial giant.
2. About 90% of world trade is carried by the international shipping _____.
3. Who is the _____ in charge of the ship's engines?
4. Standards of Training, Certification and _____ for Seafarers.
5. The _____ Mate and the Deck _____ are on deck.

E. Remember what you know about the crew and their tasks. Match the tasks to the appropriate member of the crew by writing the correct numbers in the boxes provided.

1. Captain	2. Chief Mate	3. 2nd Mate	4. A/B	5. Chief Engineer

☐ carries out maintenance on deck equipment	☐ advises the Master on fuel requirements
☐ is head of the Engine Department	☐ is second in command
☐ corrects and updates the charts	☐ stands a watch as quartermaster
☐ is responsible for the safety of the ship, crew and cargo	☐ plots the voyage on charts
☐ is head of the deck department	☐ is the company agent
☐ scrapes and wire brushes the hull	☐ plans and supervises loading
	☐ is traditionally the ship's navigational officer

UNIT 3

Ship Familiarisation

1. *Identifying parts of the vessel on diagrams*
2. *Shipboard positions*
3. *Terminology practice on parts of the ship*
4. *The Superstructure / Facilities in the accommodation*
5. *Recognising Ships*
6. *Merchant Vessels*
7. *Special Duty Vessels*

Round-up

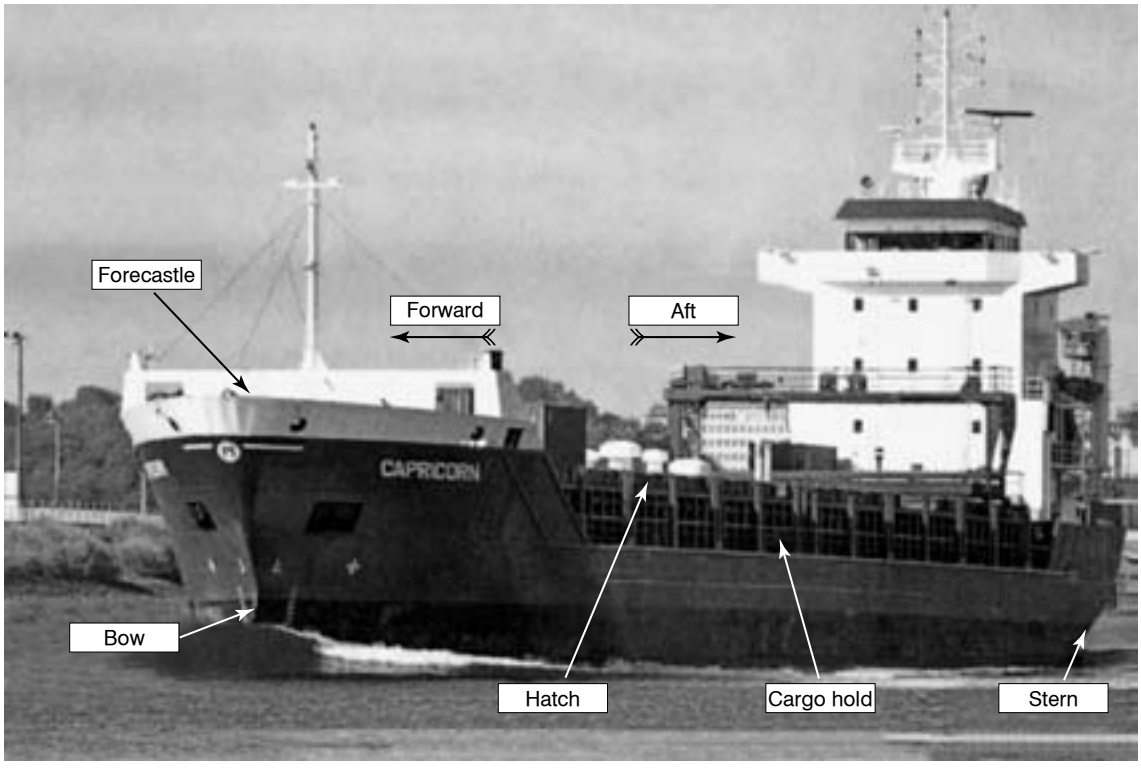
1. Identifying parts of the vessel on diagrams

A. *Introduction: a multi-purpose dry cargo ship.*

The Capricorn is a multi-purpose dry cargo ship of 6,600 DWT. She carries containers, general cargo, e.g. metal in coils, rolls of paper, and bulk cargo such as grain, coal, ore, fertilizers. The following are some of its main particulars:

Length: 118.5 metres. Breadth: 15.2 metres.
Draught: 6.3 metres. Speed in full load: 14 knots.

Lead-in: Identify the bow, the stern, the forecastle, the hatches and the cargo holds in the next figure.



Glossary

bow	the front part of a vessel
stern	the rear of a vessel
hatch	the opening on the deck of a vessel that provides access to the cargo hold
cargo hold	space where cargo is loaded
forward	towards the bow, at or near the bow
aft	towards the stern, at or near the stern

B. *Terminology Development.*

a) The diagram below gives you a profile view sketching different parts of a vessel. Look at the diagram and read the text to learn the main parts of the vessel.

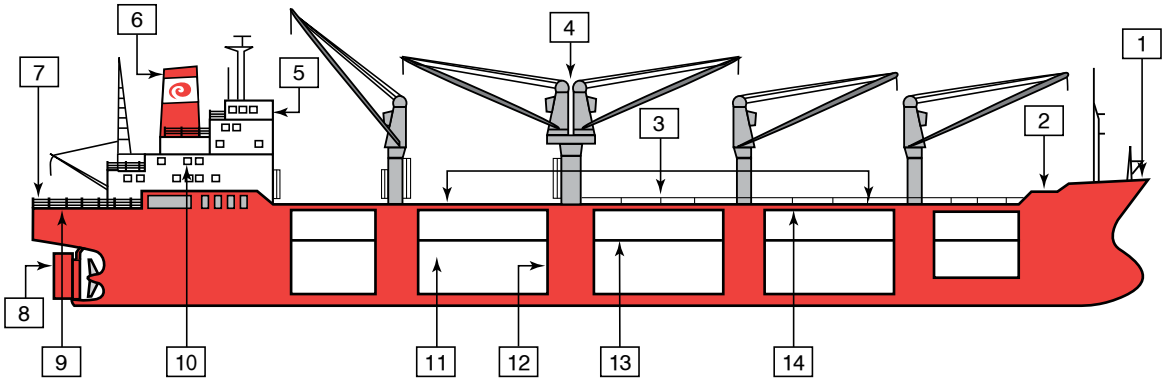
On the ***forecastle*** [2] deck superstructure we find the windlass for the anchor. Below the forecastle, inside the bulbous ***bow*** [1], there is a forepeak tank, where we store water for ballasting or for trimming the ship.

On the open ***main deck*** [3] we find large ***hatch covers*** [14] over the hatches that lead down to the ***cargo holds*** [11] below. These hatch covers are watertight and protect the hold.

Below the main deck are the cargo holds. Strong vertical ***bulkheads*** [12] separate the holds from each other. In addition to this, the holds can have removable between decks (***'tween-decks*** [13]) with their own hatches and tween deck hatch covers. This increases the number of cargo holds. Tween-decks separate the hold into a lower hold and an upper hold to store different (kinds of) cargoes. A geared vessel has its own ***cranes*** [4] that lift and move the cargo and assist in loading and discharging.

On most modern merchant vessels, towards ***the stern*** [7] of the ship we find ***the superstructure*** [10] and on it the accommodation and ***the navigation bridge*** [5].

On top of the superstructure and aft of the main mast are the ***funnels*** [6] from where the exhaust gases from the engine room go into the air. The engine room is usually at the stern of the ship below the main deck and aft of the cargo holds. Aft of the funnels is ***the poop deck*** [9] with a second set of mooring winches. The ***rudder*** [8] is a tool for changing course, changing the direction or the heading of the ship when she moves through the water.

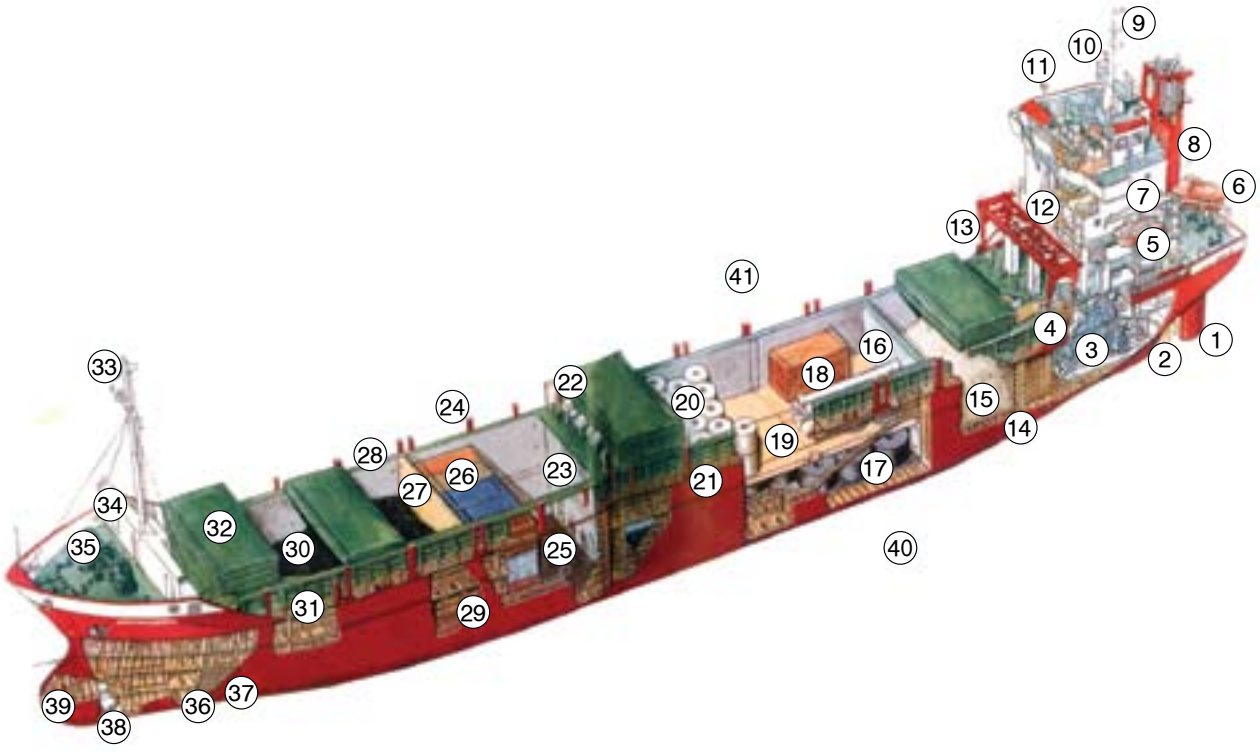


Glossary

ballasting	using water as ballast (in ballast tanks) for keeping the ship stable
trimming	to balance a ship by shifting its cargo
watertight	constructed so tightly as not to leak any water
vertical	the opposite of horizontal
separate	divide, come between
increase	become greater, larger
discharging	unloading
mooring	securing a vessel by cables, wires or ropes to a dock or to a buoy or anchoring with 2 anchors
mooring winch	a machine on a ship used to haul in mooring lines when securing the ship to a pier / wharf / quay

b) Find the following parts on the picture of the Capricorn below.

No **39** Forepeak tank in bulbous bow
No **35** Anchor windlass on the forecastle
No **8** Funnel with all exhaust pipes
No **1** Rudder
No **16** / No **23** / No **27** Vertical Bulkheads
No **19** 'tween-decks
No **12** Accommodation
No **32** Stacked Hatches



c) Find the following parts on the picture of the Capricorn above[1]. Then, listen to a Norwegian Captain, Capt. Jan Horck, who describes the main parts of the multi-purpose vessel in the picture. He starts from the forward part (the bow) and moves aft until he reaches the stern area.

1. Rudder
2. Propeller
3. Main Engine with gearbox and shaft generator
4. CO_2 bottles in CO_2 room
5. Man Overboard boat (MOB)
6. Free Fall Lifeboat
7. Crane for MOB, lifeboat, liferaft and provisions
8. Funnel with all exhaust pipes
9. Rear mast with navigation lights
10. Cross trees with radar scanners
11. Topdeck with magnetic compass and search light
12. Accommodation
13. Hatch stacking crane
14. Heavy fuel oil tank
15. Bulk cargo
16. Vertical bulkhead
17. Heavy cargo, steel coils
18. Project cargo
19. Horizontal decks, or tweendecks, or hatchcovers
20. General cargo, rolls of paper
21. Sheer strake
22. Hold fan
23. Fixed bulkhead
24. Container pedestal
25. Tanktop, max. load 15t/m^2
26. Containers, 5 rows, 3 bays
27. Vertical bulkhead or pontoon
28. Hatch coaming
29. Wing tank (ballast)
30. Bulk cargo
31. Gangway
32. Stacked hatches
33. Top light, range light
34. Breakwater
35. Anchor windlass
36. Collision bulkhead
37. Deep tank
38. Bow thruster in nozzle
39. Forepeak tank in bulbous bow
40. Port side
41. Starboard side

– A **hatch** (hatchway, hatch opening, or hatch cover) leads to a lower level, especially a hold. Hatches open by special cranes or slide to the sides.

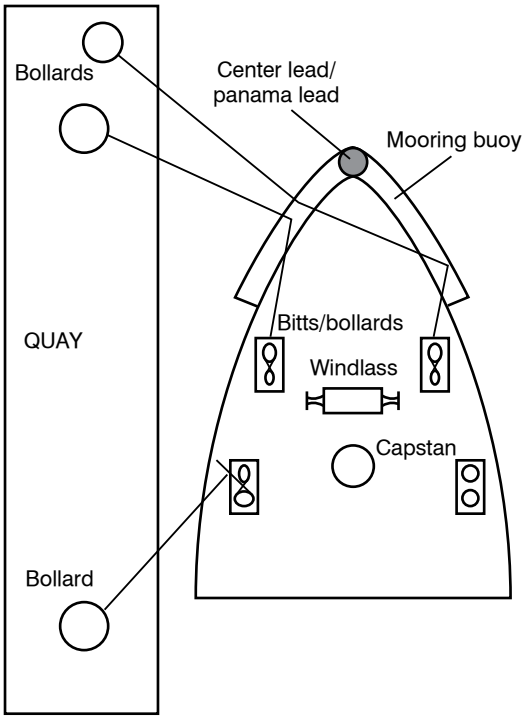
Closed hatches

Hatch covers

1. Source: *Ship Knowledge* by Klaas Van Dokkum, Dokmar, 2008 (5th edition), pp. 10-11.

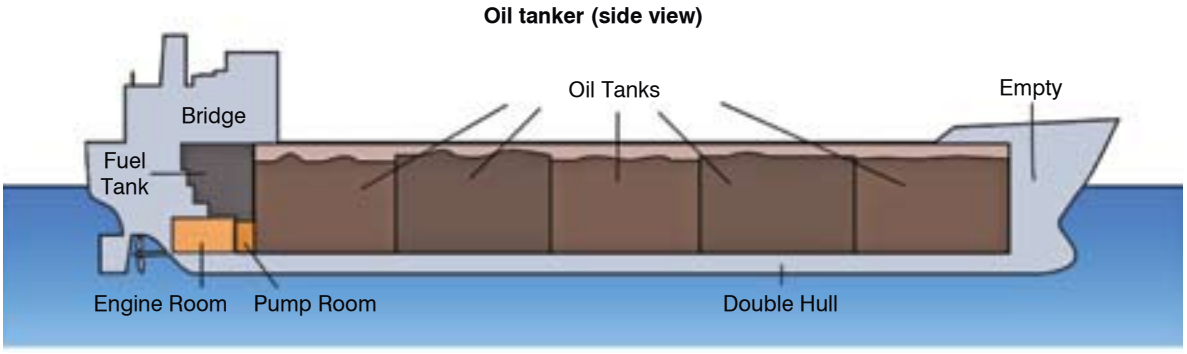
– The **anchor windlass,** up on the forecastle (also spelt *foc'sle*) of the ship, keeps the ship in position at the port anchorage area, waiting to go alongside to do cargo handling. The **windlass** is also used for handling the mooring ropes to make sure that the ship can stay alongside the quay while she is in the port.

Forecastle with anchor windlass



Bitts / bollards

d) Look at the picture of an oil tanker. What are the parts you can find in the picture that are special to this type of ship?



2. Shipboard positions

A. *Look at the words in bold that show the position.*

The bow is the part of the ship **between** the stem and the collision or forepeak bulkhead.

The space **forward of** the collision bulkhead and **below** the main deck is the forepeak. The forepeak tank is the lowest space in the bow and we use it as a ballast tank (ballast water increases the draught and reduces the trim by the stern).

Above the weather deck in the bow there is often a forecastle, a superstructure from bow to at least **above** the collision bulkhead, sometimes even further **aft. On** the forecastle is the windlass and other mooring equipment. **At the after part** of the forecastle-deck we usually find the foremast.

– Useful vocabulary for talking about where the different parts are:

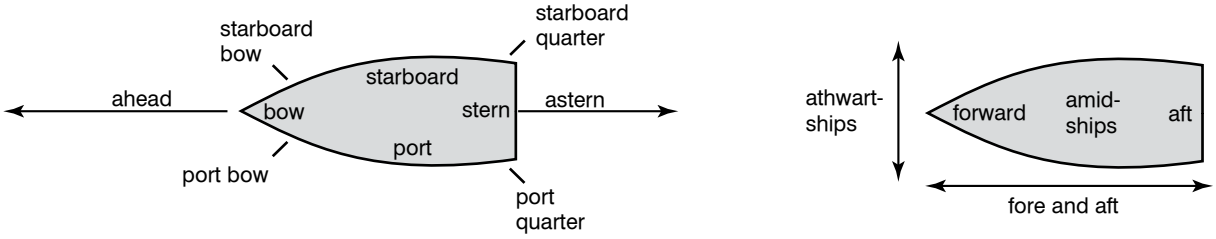
X	is	**on** **on top of** **above** **below** **between** **aft of** **forward of** **at the top of**	Y

For example: *Where is the anchor windlass?*
The anchor windlass in ***on*** *the forecastle.*

– In order to express position and movement relating to the ship, we use the following words:

Ahead = forward
Astern = backward
Ahead of = in front of
Astern of = behind the ship
Amidships = in the middle (between forward and aft, or between port and starboard)

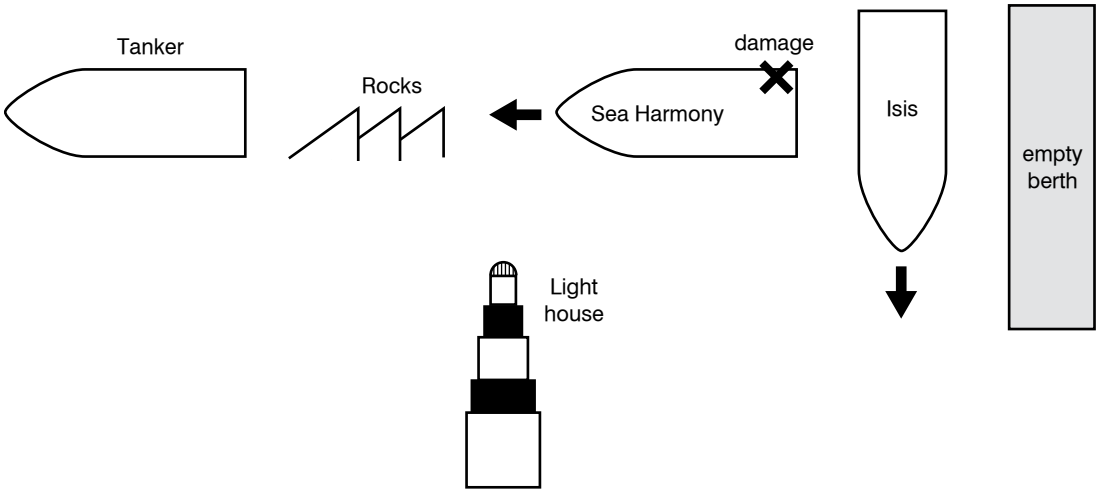
– Look at the shipboard positions and directions and study these sentences:



- There are ropes **fore and aft**. (fore and aft = at the bow and at the stern)
- The fire party is **amidships.** (amidships = in the middle of the ship)
- There is shallow water **ahead of** your vessel. (ahead of = in front of the ship)
- Do not pass **astern of** my vessel. (astern of = behind the ship)
- #1 hold is **forward of** #2 hold. (forward of = in front of)
- The funnel is always **aft of** the navigation bridge. (abaft or aft of = behind)

- There is a light buoy at a distance of two miles **ahead**. (=in front of the ship)
- When you are facing the bow you have the starboard side on your right and the port side on your left: right is called the **starboard** side and left the **port** side. The word "port" comes from the old times when a sailing ship always moored the left side of the ship to the quay in port. The ship is moored to the quay **in port**.
- The hull surface of the stern is called the **port quarter** or the **starboard quarter**.
- The hull surface of the bow is called the **port bow** or the **starboard bow**.
  e.g. the ship hit a rock on the port bow.
  e.g. there is damage to the hull on the port quarter.

B. ***Fill in the correct preposition according to the sketch.***



1. The rocks are _____ the Sea Harmony.
2. The lighthouse is on _____ of the Sea Harmony.
3. The Isis is passing _____ the Sea Harmony.
4. There is damage to _____.
5. If you look _____, you'll see a tanker two miles _____ the Sea Harmony.
6. If you look _____, you'll see an empty berth _____ the Sea Harmony.

3. Terminology practice on parts of the ship

A. ***Look at this picture of a large ungeared bulk carrier and answer the questions.***

- How many holds does it have?
- Does it have cranes? Where is the poop deck? The bridge? The forepeak tank?
- Can you find the funnel? The hatch covers? The propeller? The superstructure? The forecastle?

B. *Fill in the correct words. Then show the hull, double bottom and compartments in the picture above.*

bottom, compartments, hull, plating, ladders

1. The whole body of the ship is called the_____.
2. The outer surface is called the _____.
3. The space between the cargo holds and the _____ contains the **double bottom tanks** for ballast and sometimes for fuel.
4. Stairs on the ship are often called _____.
5. Rooms (space) on a ship are often called _____**,** separated by watertight bulkheads.

Lead-in: Underline the correct word.

1. M/V Tasoula had a **collision / crash**.
2. In case of fire, use your breathing **device / apparatus**.
3. Cargo is **stowed / stored** in the holds according to the stowage plan.
4. The Bosun checks the **stores / stowaways** and orders new ones regularly.
5. A **perpendicular / transverse** dividing wall is situated across (crosswise).

C. *The following are definitions or descriptions of the parts of the ship, so that you can learn their function. Choose words from the box to fill in the gaps for full definitions.*

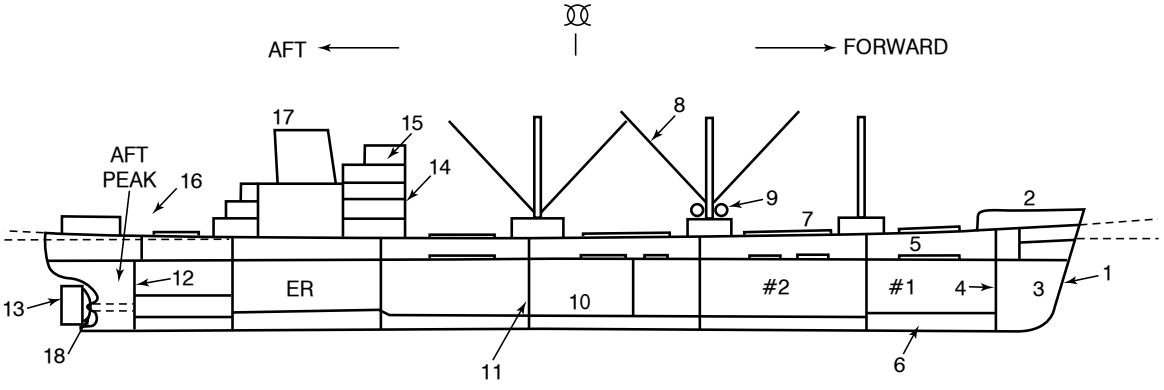
cargo	watertight	space	hull	stowed
rotating	above	stores	stern	lifting

1. **forecastle**: a superstructure at the bow of a vessel used as a shelter for _____, machinery, etc.
2. **fore peak tank**: space between the collision bulkhead and the stem plating, the extreme forward part of the interior of the _____.
3. **double bottom tank**: _____ between the inner and outer bottom plating of the hull, used for storing fresh and ballast water and fuel oil.
4. **hatch cover**: cover for the opening through which _____ can be loaded and unloaded.
5. **derrick**: large device on the deck of a ship for _____ and moving heavy objects with the use of winches.
6. **hold**: compartment on board a ship where the cargo is _____.
7. **transverse bulkhead**: a wall-like transverse structure inside the vessel forming _____ compartments.
8. **collision bulkhead**: a watertight partition near the bow for keeping out water in the event of a collision.

9. **superstructure**: a construction built _____ the main deck of a vessel, including the forecastle, bridge and the poop.
10. **poop**: the aft part of the ship towards the _____.
11. **propeller**: a device with twisted blades, which while _____ causes the ship to move.

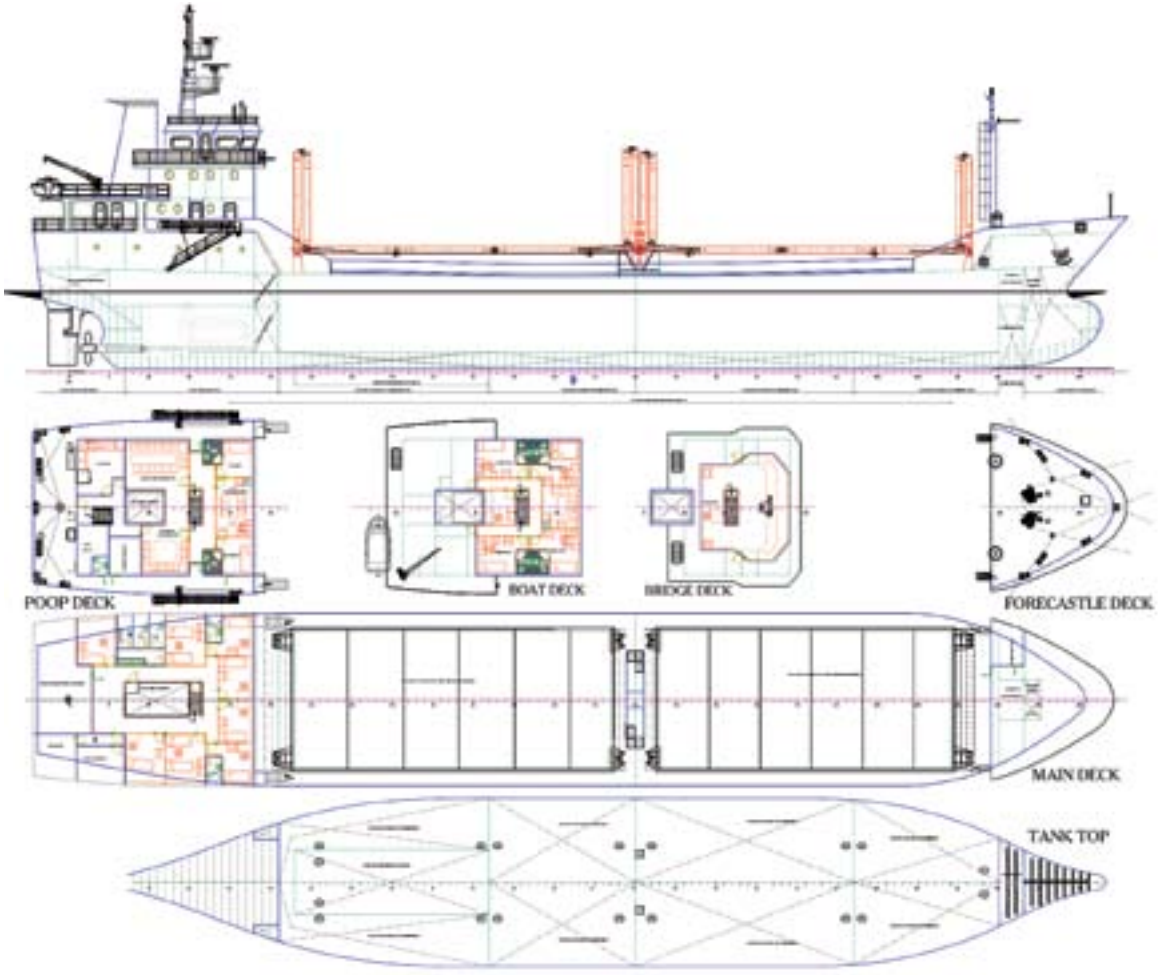
D. ***Identify the numbered parts in the following diagram. Use the words from the previous exercise and all the words for parts of the ship you have learnt so far.***

1.	7.	13.
2.	8.	14.
3.	9.	15.
4.	10.	16.
5.	11.	17.
6.	12.	18.



The General Arrangement Plan of a vessel shows a profile view of the vessel and plan views of the decks and the tank top.

So, for the ship above this is what the general arrangement plan looks like:



When we identify the parts of a ship in a General Arrangement Plan,
– holds and other special spaces are **compartments**,
– decks and bulkheads are **partitions**, or, in other words, separations or divisions.

E. *Put the compartments and partitions into the correct list.*

Bosun's store Double Bottom Superstructure Forecastle Main (or Upper) deck
Tank top (or lower deck) Tweendeck Fore / aft peak collision bulkhead Chainlocker
Fore / aft peak tanks Engine Room Upper / lower cargo holds

Compartments	Partitions

F. ***Match the parts of the ship from the previous exercise to their function, according to the purpose they serve on board.***

Part of the Ship	***Function***
_____	: anchor, winches are there
_____	: storage of anchor chain
_____	: storage of ropes, paint, etc.
_____	: provides shelter for all contents of vessel
_____	: divides the vessel into separate holds
_____	: inside bottom of vessel
_____	: contain cargo
_____	: storage of ballast water, they also absorb impact in case of collision
_____	: prevent vessel from flooding, also fire proof and fire retarding
_____	: contains vessel's propulsion plant
_____	: accommodation, messroom and galley are there
_____	: provides strength, storage of fuel, luboil, fresh and ballast water

4. The Superstructure / Facilities in the accommodation

A. ***Read about the superstructure and then complete the sentences.***

1. The superstructure has a number of decks.
2. On the 1st deck we can find _____.
3. On the 2nd deck there is accommodation for the crew.
4. On the 3rd deck, there is _____.
5. On the 4th deck, there is accommodation for the Captain, the Chief Engineer, the Chief Mate, the Ship Owner.
6. On top is _____.
7. Finally, on top of the bridge is the main mast, _____.

The superstructure: Accommodation and Navigation Bridge

The superstructure has a number of decks. On the 1st deck there are the dining rooms for the crew and the officers called "the mess" and the ship's galley. On this same deck are the dayroom for the crew, and a lounge or dayroom for the officers.

Other recreation space for the crew includes a gym and a sauna. On the 2nd deck we find the accommodation or living quarters for the crew including engineers and electricians. On the 3rd deck is the accommodation for the officers – on the starboard side the First Officer's cabin and office; on the port side the living quarters for the Second and Third Mate. Amidships on the 3rd deck is the Conference Room and the Ship's Office. On the 4th deck are the Captain's day room and bedroom, the Chief Engineer's cabin and office and aft of these on the starboard side the Chief Officer's cabin and office. On the port side is the cabin for the Ship's owner.

On top of the superstructure is the navigation bridge. A modern navigation bridge has workstations for navigating the ship, a Chart Desk and a Communication Workstation (also called the Radio Room). On the side are the bridge wings to improve visibility from the bridge. On top of the navigation bridge is the main mast with the radio antennas, navigational and signal lights and radar scanners.

Glossary

recreation	amusement, enjoyable activity
improve	make or become better
visibility	distance it is possible to see

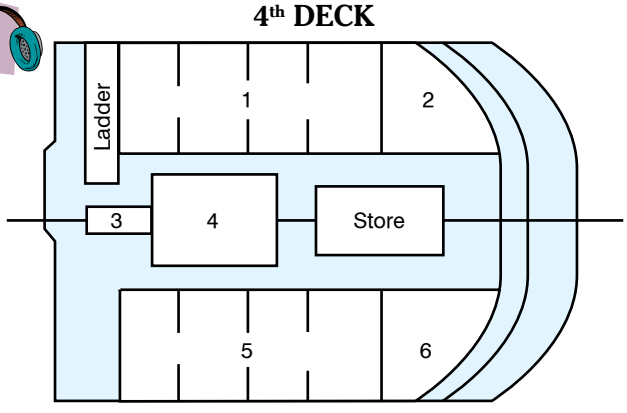
B. ***Match the places on board to the activity that can be done there.***

Galley	Hospital	Cabin	Radio room	Messroom
Bridge	Laundry	Gym	Lounge	

1. _____ / eat
2. _____ / sleep
3. _____ / work out
4. _____ / send VHF radio messages
5. _____ / watch TV with the rest of the crew
6. _____ / get first aid, basic medical treatment
7. _____ / cook
8. _____ / wash clothes
9. _____ / navigate

C. ***Listen to the captain. Which of the places above does he mention in his announcement? Tick the ones you can hear.***

D. ***Listen to a description of the location of the living quarters on fourth deck. Write what is in the different spaces in the diagram below.***

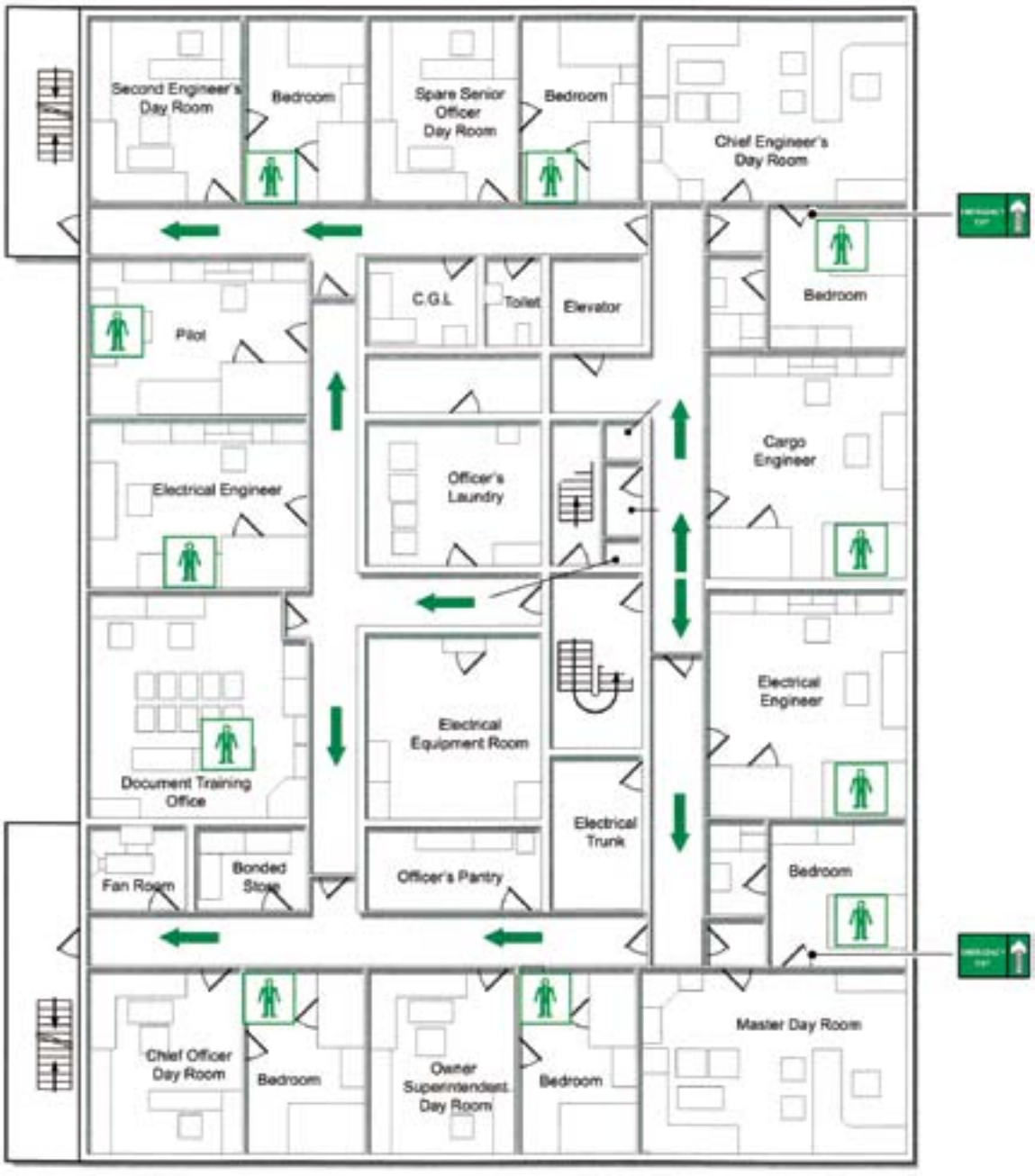


E. *Look at the plan of D Deck of an LNG ship[2]. Answer the following questions.*

1. Where is the elevator?
2. Where is the Chief Officer's cabin?
3. Where is the Chief Engineer's cabin?

– Use prepositions/expressions like *opposite, next to, between, at the end of the corridor…*

D Deck



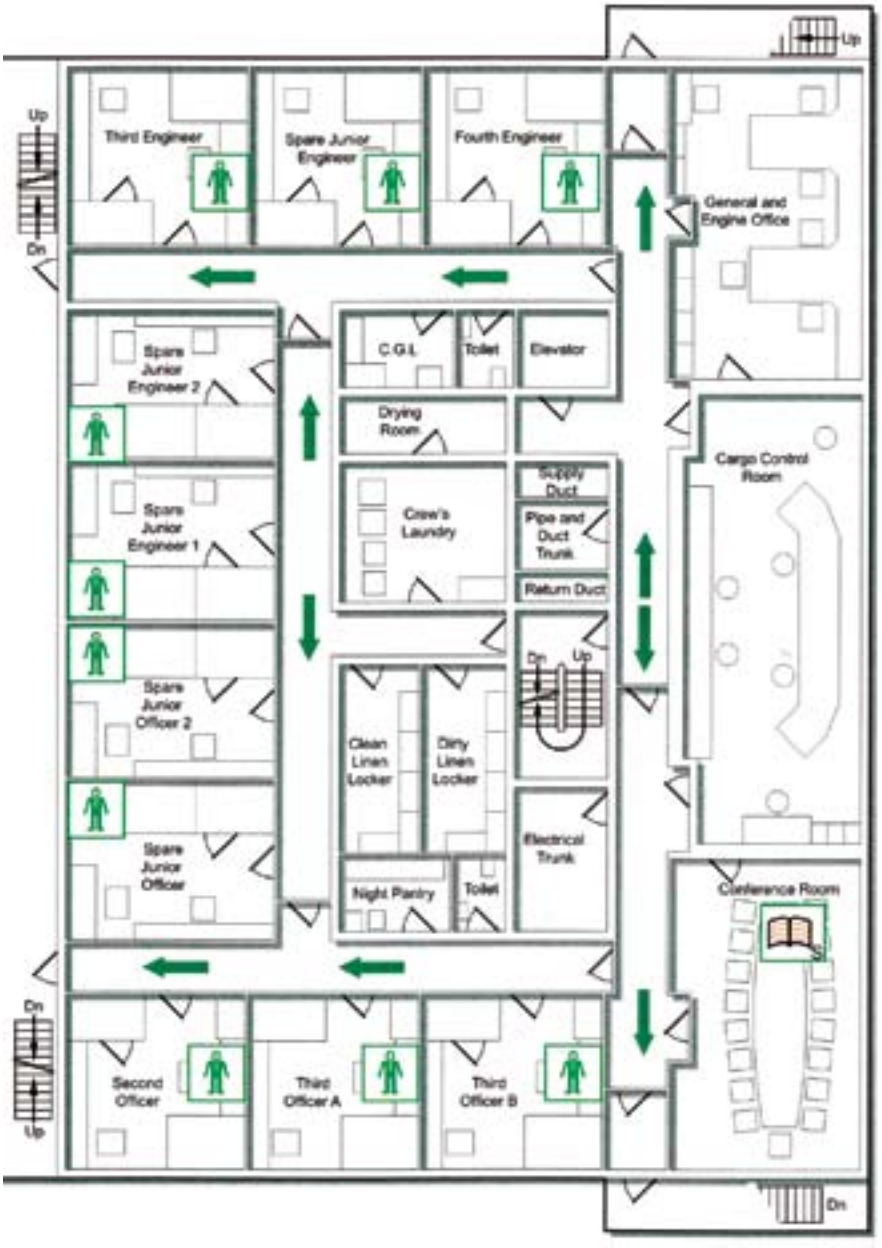
2. The plans are from "SOLAS and Fire Fighting Manual", Methane Jane Elizabeth, Ceres LNG Services Ltd.

F. ***Look at the plans of D Deck and C Deck of the ship. Work in pairs to ask for and give directions to different places on board.***

Student A, you are at the **Conference Room, on C Deck.** Ask for directions to the ✓ Officer's Laundry ✓ Owner's Cabin	Student B, you are at the **Document Training Office on D Deck.** Ask for ask directions to the ✓ swimming pool ✓ Engine Office

– Use expressions like: *Excuse me, how do I get to…?*
Go up the stairs / straight… Turn right / left… It's the 2nd door to your right…

C Deck



5. Recognising Ships

What types of vessels are these?

A. *Match the vessels in the pictures to their descriptions.*

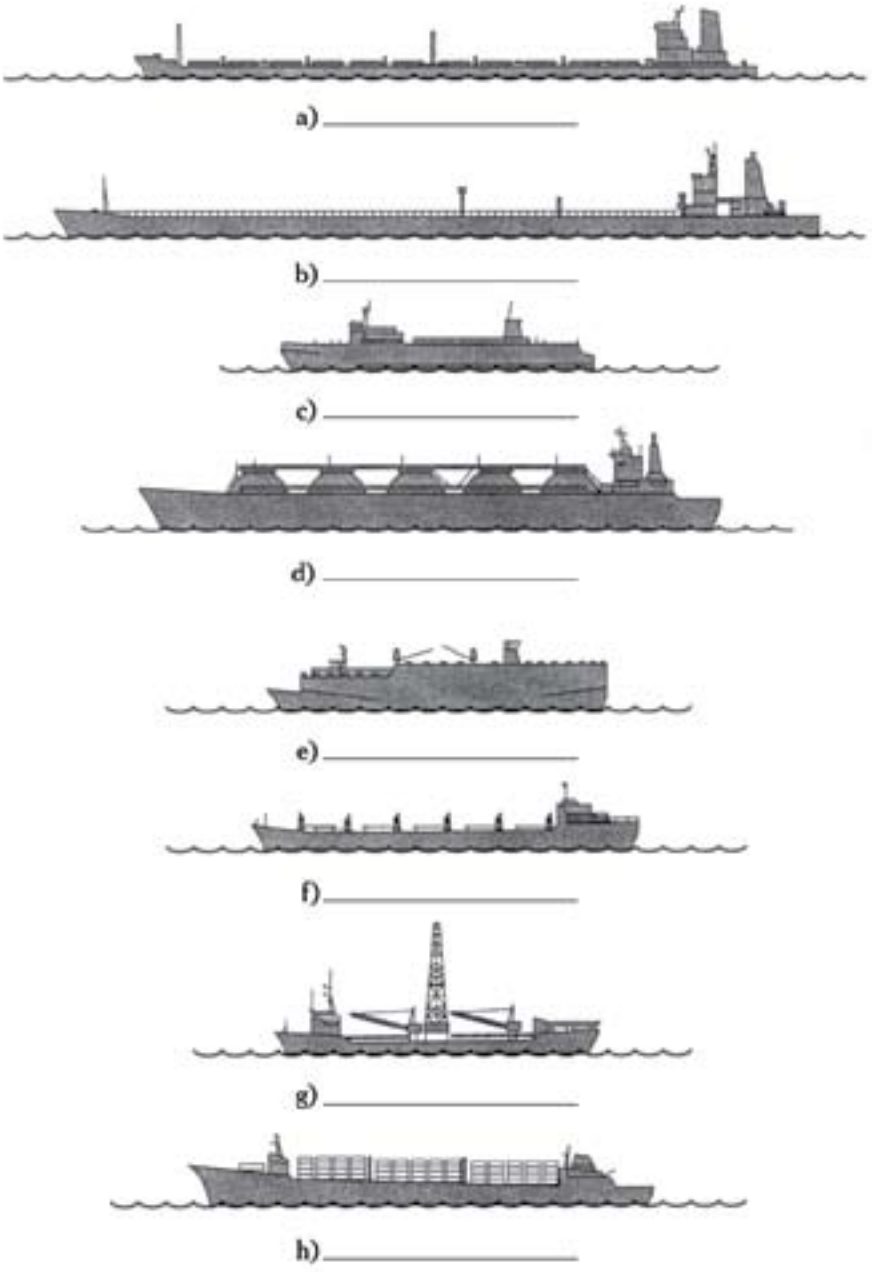
1. **Container ships** are known as "box" ships. The "boxes" they carry are containers, gene-rally found in 20 and 40–foot lengths.
2. Ferries with passenger facilities suitable for longer routes are called **passenger-car ferries** (Paxcar ferries). They have a full length superstructure for the passenger cabins and public spaces.
3. **Tankers** carry liquid cargo, not only oil, in tanks. They usually have an aft superstructure.

B. *Write the name of each type of ship under the profiles of the figure that follows; use the following descriptions.*

1. **The LNG (Liquified Natural Gas) carrier** is a type of tanker. The LNG vessels carry extremely dangerous cargo, explosive gas, kept at below freezing temperatures. The shape of the LNG carrier, with the huge round tanks seen along the deck, has led to the nickname of "Dinosaur Eggs Carriers".
2. The **bulk carriers** are single deck vessels, generally with five to nine holds, their hatches are equipped with sliding hatch covers.
3. **Drill ships** are vessels fitted with a drilling apparatus that can drill below the seafloor,

looking for new oil or gas wells in deep water or helping in scientific survey.

4. Some bulk carriers are designed to function also as tankers. Such vessels are called **Ore Bulk Oil (OBO) carriers**.
5. **Railway ferries** have internal rails for taking trains.
6. Seen from a distance **the container ship** has a very characteristic "flat" silhouette. The small superstructure with the navigating bridge is usually at the stern of the ship and the containers are stacked fore of the bridge along the whole length of the vessel.
7. **Tankers** have a long hull with small freeboard and a number of pipelines on deck.
8. **Vehicle carriers** carry cars and trucks on a "drive on / drive off" basis. There are a number of decks and the hull has a box-type rectangular profile.



Which of these vessels is not a cargo vessel, but a specialized one?

6. Merchant Vessels

– Vocabulary assessment.

Use the vocabulary development scale to rate the following words:

5 can explain and use in different contexts
4 use in a limited way in speaking/writing
3 understand the "gist" of it
2 recognise but don't understand
1 unknown to me

Decline	Container securing	Routes
Collision	Pipeline	Massive
Edible	Replaced	Convenient
Cargo shifting	Removable	Bunkering
Prevent	Rapidly	Grounding
Available	Installed	Maintained

Which of these words are definitely part of Maritime English terminology?

Types of merchant vessels

– The bulk carrier

Today, modern commercial vessels are highly specialized, designed to carry specific types of cargo. The names of ships tell us what type of cargo they are designed to carry. As their name suggests, bulk carriers, also known as "Bulkers" or "Bulkies", transport their cargo in bulk. They carry bulk cargo, "loose" cargo, either "dry bulk" such as coal, grain, iron ore, fertilisers, cement, sugar, light minerals or "liquid bulk" such as a range of chemicals including petroleum products.

Dry bulk carriers

- have huge under-deck specialized holds where the bulk products are poured and stored.
- come in different sizes, from the so-called "handysize" bulk carriers of about 25,000 to very large carriers of up to 220,000 dwt, with a typical speed of no more than 15 knots.
- can have deck cranes or simply deck hatches
- have longitudinal and cross walls, called bulkheads.

– The tanker

The tanker is one of the most important vessels in the world's merchant fleets today. Tankers carry liquid cargo in tanks. Their size is growing rapidly in recent years. The best known are the oil tankers. They come in two kinds: the crude carrier, which carries crude oil, and the clean-product tanker, which carries refined products such as petrol, gasoline, aviation fuel, kerosene and paraffin.

Tankers range in all sizes from small bunkering tankers of 1,000 dwt, used for refueling larger vessels, to the real giants, the VLCC of 200,000 - 300,000 dwt and the ULCC of over 300,000 dwt., the biggest ships afloat. The most common type of tankers today are the VLCCs, accounting for 50% of the world tanker fleet. Their large draught limits their sailing routes. There are only a few ports that supertankers can enter and so they are mostly loaded and unloaded from off-shore pumping stations. They operate at normal speeds of around 16 knots.

LNG carriers carry Liquefied Natural Gas at temperatures below minus 160°C in free standing spherical tanks with domes visible above the deck. This means that they carry extremely hazardous cargo, so safety measures on board have to be very strict. The LPG is designed to carry liquid petroleum gas at very low temperatures.

- Tankers have pipelines on deck.
- For safety and ease of walking a catwalk is provided.
- The cargo space is divided into tanks with transverse and longitudinal bulkheads.
- Tankers must have large pumps to move the cargo out of the tanks.
- Some of them have double hulls to prevent pollution in case of a collision.

– The general cargo ship

Until a few decades ago, the most important cargo ship was the break-bulk carrier, sometimes called the general cargo ship or freighter. The cargo is carried in break bulk form i.e. it is loaded into and broken out of the ship piece by piece. General cargo ships are different from bulk carriers as they can transport cargo in various shapes and sizes, for instance packaged products, heavy machinery items, etc.

- The size of these ships is between 10 to 20,000 dwt, and normally they operate at speeds between 16 to 20 knots.
- They have double bottom tanks, which are used for storage of fuel and water.
- The hull is divided by transverse bulkheads to form holds, typically four to six.
- The holds are further divided by one or two 'tweendecks with hatch ways that may be folded on sides.
- The general cargo ships may sometimes have one or two holds as "reefer holds" to carry refrigerated cargo.

Even though it still takes a lot of time to load and unload general cargo ships, over the years there are changes in the cargo handling equipment. Cranes and heavy lifting equipment have replaced the derricks. Also, the design and operation of hatch covers is now much better and this makes operations easier and faster.

– The container ship

The first container ship was built in the 1960s and since then it has revolutionized shipping. Container vessels are designed to carry cargo placed inside containers of a uniform size. The TEU (twenty-foot equivalent) unit is used to measure container volume and it refers to a container with external dimensions of 8×8×20. Volume is sometimes measured by FEUs, forty-foot equivalents (8×8×40), as well. In the past couple of years, the largest container vessels have grown in capacity up to 19,500 TEU. Fully containerized vessels (cellular vessels) have permanently installed cell guides which not only guide the containers in stacking one on top of the other, but also provide adequate securing.

Containers can be filled with just any type of cargo, from refrigerators to fruit or meat. They are usually stowed on the deck of the ship or inside. At the container terminals these ships can quickly load and discharge by means of large quay-side cranes called gantry cranes. The cranes lift the containers off or onto the quay or trucks and off or onto the ship's deck. While a

conventional dry cargo vessel may take 3-4 days to load or discharge, a container ship can do the same in a matter of hours. Also, the higher speed of around 26 knots is the main advantage of container vessels over other cargo ships.

Glossary

rapidly	quickly
bunkering	supplying a ship with fuel
operate	work, do business / control the working of a machine
strict	following carefully and exactly a set of rules
longitudinal	placed lengthwise, in the direction of the length
refrigerated	made / kept cold by refrigeration
revolutionise	change radically, cause a transformation
uniform	always the same, having the same characteristics
adequate	enough, sufficient
conventional	following accepted standards, traditional

A. ***Form four groups. Each group chooses one of the types of ships in the following chart. Fill in the information you can find in the text about the characteristics of the type of ship you chose. Then, one person of each group will present this information in class.***

Type of ship	Cargo	Cargo is carried in/on…	How loaded/ unloaded	Special structural features	(Max.) Speed	Size(s)
General cargo ship						
Dry bulk carrier						
Container ship						
Tanker						

As you listen to the other groups present their type of ship, keep notes of their basic characteristics by filling in the chart. Then, read about the other types of ships to check this information.

Handymax Dry Bulk Carrier

Chemical Tanker

B. ***Each of the following paragraphs has a missing sentence. Use the sentences (1-5) to fill in each gap.***

1. The modern double-hulled Mobil Oil tanker "Eagle" of 284,493 dwt was built in 1993.

2. They have huge entertainment facilities.

3. So what is the function of these ships now?

4. And there are ramps inside, to enable vehicles to climb up to a higher deck.

5. They can have as many as four cranes.

– More facts about types of ships:

- ***General cargo ships*** are gradually replaced by container ships. Their number is on the decline. (A)_____ They carry cargo that is too large to be carried in a container, for example steel coils, rolls of wire and machinery. They also carry boxed goods that are too small to fill a whole container.

- When a ***crude oil tanker*** is damaged by collision or grounding, the leaking of vast amounts of oil into the sea can destroy the environment. This explains the strict requirement for these vessels to have a double hull. In 1990, the United States passed the Oil Pollution Act (OPA). It requires a gradual introduction of tankers with double hulls, not just with double bottoms but also double on both sides, until 2015; (B)_____

- The ***Ro-Ro*** (which means a roll-on, roll-off vessel) is a special cargo vessel with huge stern (or bow) doors which are lowered to make a bridge from the ship to the wharf. Whole trucks can roll on and off very rapidly at ports. There are two main types: the passenger Ro-Ro and the cargo Ro-Ro. Modern car-passenger ferries operate on short-sea routes. The whole bow section lifts up leaving a massive entrance for lorries and cars. And there is another pair of doors and a ramp in the stern. Cars and lorries drive around inside the ship. (C)_____ An extreme number of vehicles can be packed into these ships. They are convenient for local ferrying jobs, especially in places where there are lots of islands, or fjords, or big rivers.

- Modern ***cruise ships*** offer more luxury and style to holiday makers than ever before, turning an ordinary ship into a mini-city for 3000+ guests. (D)_____ The passenger ships have several decks in their large superstructure above the uppermost continuous deck to provide accommodation, dining rooms, lounges, restaurants, theatre, shops, swimming pools, promenade decks, etc.
- ***Multi-purpose carriers*** transport different kinds of cargo; break-bulk and/or pure bulk cargoes and/or containers, even reefer containers for frozen meats or fruit. Many of them are geared vessels, they are equipped with their own cargo cranes for loading and discharging. (E)_____ Hatch openings are designed to fit standard container sizes. Removable 'tweendecks increase the number of available holds. In the huge bulk holds there are removable bulkheads that help prevent the grain and other bulk cargoes from shifting.

Glossary

gradually	step by step
on the decline	the number is going down, decreasing
grounding	to run aground, running ashore, hitting the bottom
leaking	minor inflow of water into the vessel due to damage to the hull or escape of liquid out of pipes, tanks, etc.
massive / huge / vast	extremely large
convenient	suited to your needs, fitting, handy

C. *Match the words to form phrases / collocations.*

1. Sailing _____	Shifting
2. Passenger _____	Dimensions
3. Cargo _____	Gas
4. General arrangement _____	Tanker
5. Liquefied Natural _____	Decks
6. Oil Pollution _____	Accommodation
7. Double-hulled _____	Maker
8. External _____	Act
9. Holiday _____	Plan
10. Promenade _____	Routes

D. *Choose the correct word.*

1. Bridge wings improve **visibility / visible**.
2. Double-hulled tankers **gradual / gradually** replace single-hulled vessels.
3. Good knowledge of the ship's safety features is a basic **requirement / require** for all crewmembers.
4. **Longitude / longitudinal** and transverse partitions are an important structural feature of the ship.
5. The Coast Guard station **operations / operates** on a 24-hour basis.
6. Does this ship carry **refrigerator / refrigerated** cargo?

E. *Underline the correct explanation.*

Hazardous = harmful / harmless
You can see it = edible / visible
Rapid = quick / slow
Group of ships = fleet / afloat
Ordinary = conventional / convenient
Stop = prevent / improve
Discharging = Unloading / shifting
Install = build in / arrange

F. *Match the opposites.*

refined	discharging	fixed	longitudinal	lowering

1. removable _____
2. transverse _____
3. loading _____
4. lifting _____
5. crude _____

LNG shipping overview[3]. You will listen to an overview of the LNG industry recorded in 2005.

G. *The following topics are covered by the overview. In what order are they mentioned? Listen and write the correct number (1-5) in the boxes provided.*

☐ Terminals: Plans for the building of more loading and receiving terminals.
☐ Routes: Existing trade route patterns and plans for new ports and routes.
☐ Personnel: There is a need for competent personnel to transport this demanding cargo.
☐ Fleet expansion: The world fleet of LNG ships is rapidly expanding in terms of both vessel numbers and operators.
☐ Ship Types and Sizes: The types of LNG ships and percentages for each type; plans for the building of ultra large ships.

H. *Listen again and fill in the gaps.*

1. In 2004, number of ships: _____, capacity: 80,000-138,000 m^3 (cubic meters)
2. Number of new ships on order: _____
3. Types:

Moss-Rosenberg sphere design: _____ %
Gaz Transport membrane system: _____ %
Technigas membrane system: 11 %
Other types: 2 %

4. New Ultra Large ships, capacity: _____ m^3
5. Loading terminals: existing: 36, under construction: _____
6. Receiving terminals: existing 43, under construction: _____
7. Quantity of LNG gas transported now: _____ million tonnes per year, future increase: 50 million tonnes.

3. Extract from "LNG Shipping overview", 2005, Podcast recorded for Seamanship International.

8. By 2015, Qatar will produce _____ million tonnes per year.
9. Existing regular trade route patterns:

From:	**To:**	**From:**	**To:**
Australia, Indonesia, Oman, _____, Brunei	Japan	Algeria, _____, Trinidad	_____

10. More routes and new discharge ports in:

Qatar Saudi Arabia _____ Egypt	India _____ the Caribbean the USA

7. Special Duty Vessels

There are also vessels designed to assist other vessels or provide special services to navigation. We call them auxiliary vessels, or special duty vessels. Can you think of any?

A. ***Read the following statement and say which of the three pictures above it goes with.***

> ***Tugs might look like small, harmless ships but they can have more power than a medium-sized cargo vessel and can manoeuvre in any direction with ease. In this way they make sure that the big ocean-going vessels reach their berth quickly and safely.***

B. ***Listen to a lecture on three types of auxiliary vessels. Fill in the chart and match the pictures on the previous page to the three types of vessels.***

1. _____ 2. _____

a. *seagoing* _____ 3. _____ *boat*

b. _____

c. _____

C. ***Read the following sentences from the lecture. Find synonyms to the words below.***

1. *Seagoing tugs* are used for: salvage, towing, anchor handling in the offshore industry.
2. Tugs can tow to a position at sea any floating object, like partly completed ships, floating wrecks.
3. *Escort tugs* operate in confined coastal waters and are small seagoing tugs that can push or pull a large ship away from a dangerous area when its own propulsion is not sufficient.
4. *Harbour tugs* are used for fighting fires and environmental disasters.
5. A Vessel Traffic Service (VTS) controls the shipping using a shore-radar system and radio communication. A shore-based controller informs the ship's crew and/or the pilot of possible hazards and other traffic.

– Rescue = …….

– Pulling along through the water (by a rope) = …….

– Not on land = …….

– Staying on the surface of the sea, not sinking = …….

– Limited, where movement is restrained = ……..

– Enough = ……..

– Catastrophe = ……..

– Dangers = …….

Piraeus VTS Tower

D. ***Review: What is the name of the vessel which...***

- assists other vessels to enter or leave the port? _____
- assists with the pilotage of another vessel? _____
- opens a way through ice? _____

E. ***Listen to a lecture on vessels of assistance and service and tick ☑ the types of vessels you hear.***

	Survey ship
	Tug
	Icebreaker
	Dredger
	Pilot tender
	Lightship

	Weather ship
	SAR vessel
	Cable layer
	Supply ship
	Drilling ship

F. ***What is the name of the vessel which...***

- searches and rescues vessels in distress? _____
- lays cables on the bottom of the sea? _____
- serves as a beacon for navigation? _____

Round-up

A. Vocabulary Consolidation Self-Assessment.

Can you talk in English on the following topics? Give at least 5 examples plus 5 keywords for each.

☐ different types of merchant vessels
☐ special duty vessels
☐ accommodation and facilities on board
☐ general arrangement plan and main parts of a ship
☐ asking for and giving directions on board

B. Class Project.

In groups of 2 or 3 do the following project to present in class. The class can make a poster of your findings.

- Look up a type of vessel and present it in class. Choose one of the following: **reefer, dredger, cement carrier, cable-laying ship, heavy-lift ship.** Bring pictures, a general arrangement plan, any information you can find on its basic characteristics, its function, its cargo.

C. Vocabulary Revision. Find the missing word (the first letter is given).

1. The anchor winches are situated on the f_____.
2. The spaces that contain cargo are called upper and lower cargo h_____.
3. Ropes and paint are stored in the b_____ s_____.
4. You can wash your clothes in the ship's l_____.

5. M_____ ropes are used to make fast the ship to the q_____.
6. To go aboard a vessel you can use the e_____ ladder.
7. The r_____ is a tool for changing the direction or the h_____ of the ship when she moves into water.

D. Listen to the speakers. Which type of ship do they work on? Choose from the list below.

Tanker	Container ship	Cruiser
Pilot boat	Dredger	Bulk carrier
Reefer	Tug	

1. Speaker A works on a _____
2. Speaker B works on a _____
3. Speaker C works on a _____
4. Speaker D works on a _____
5. Speaker E works on a _____
6. Speaker F works on a _____
7. Speaker G works on a _____
8. Speaker H works on a _____

E. Vocabulary Revision. Fill in the missing words.

- _____ ships carry cargo in special " boxes".
- _____ carriers carry loose cargo, like grain.
- The Capricorn makes a speed of 14 _____. She can carry 416 _____ containers. Her grain _____ is 328,500 cubic feet. Her _____ is 15.2 meters and her _____ overall is 118.55 meters.
- The escape _____ is situated between the ventilation areas in the forward part of the upper deck, opposite the sauna.
- There are sea-going and harbour _____.

F. Look these words up in the SMCP glossary. What do the initials stand for?

SAR _____

RCC _____

TEU _____

VTS _____

VHF _____

PA-system _____

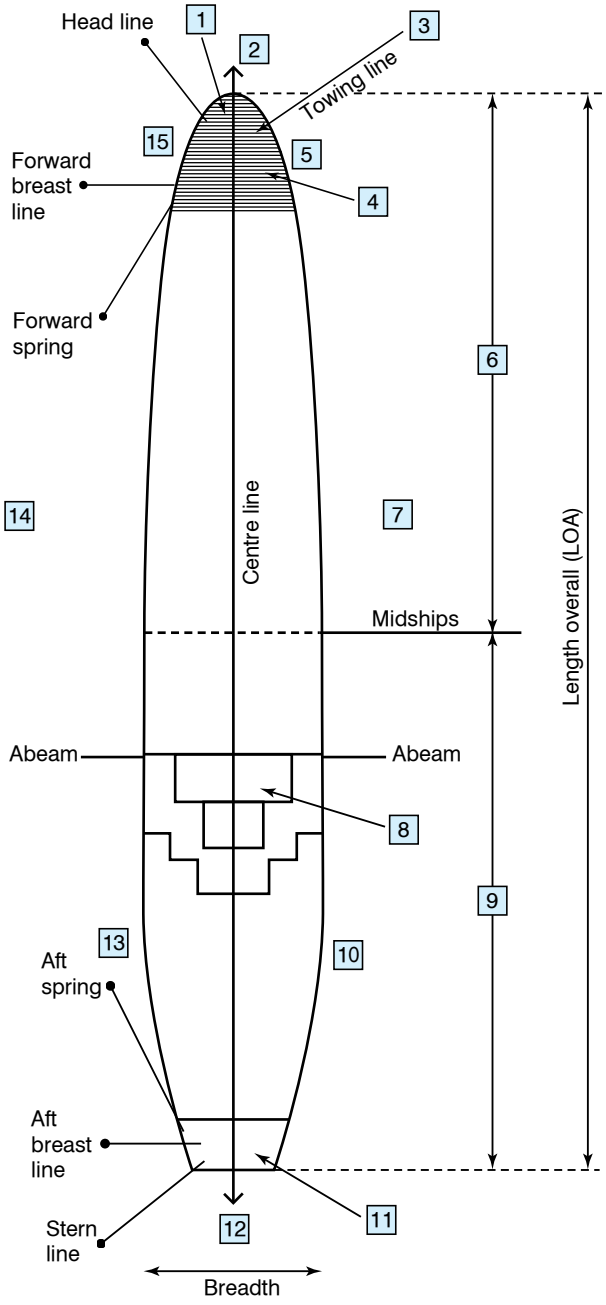
ETA _____

GPS _____

G. Fill in the SMCP sketch with words you learnt in this unit. These are the words you need.

Forecastle	Port	Aft	Port quarter	Bow / stem
Port bow	Starboard	Stern	Starboard quarter	Ahead
Tug	Forward	Bridge	Starboard bow	Astern

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	



UNIT 4

Safety Equipment On Board

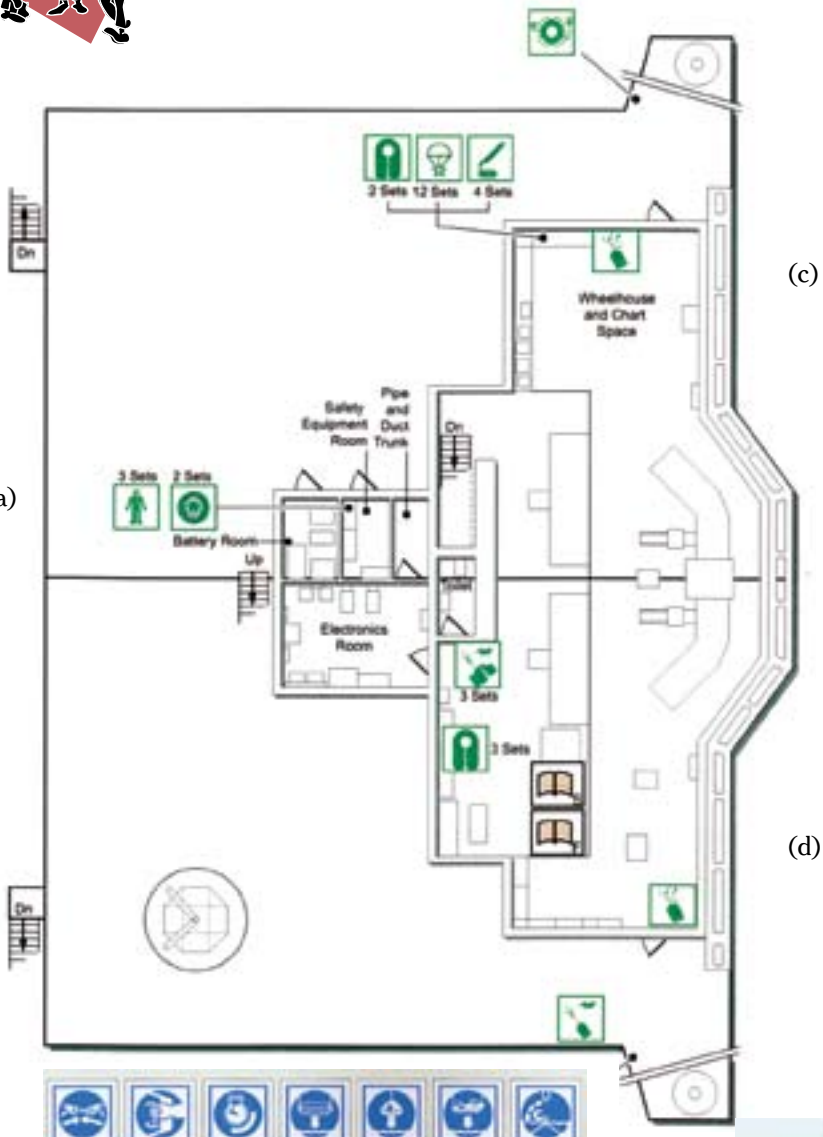
1. *Safety of Life at Sea: The Convention*
2. *IMO Safety Signs*
3. *Safety On Board: Oral Commands*
4. *Location and Purpose of Safety Equipment*
5. *SOLAS requirements: Surviving Disaster*

Round-up

Lead-in: Check what you know.

The following pictures show items related to Safety On Board, and particularly Safety Equipment On Board. What is shown in each picture? Match the text to the pictures as a starting point to discuss in class.

(a)



(b)

(c)

(d)

(e)

(f)

(g)

• Instructions on how to use survival craft	• Personal Life-saving Appliance approved by SOLAS – inflatable lifejacket	• Where safety equipment is located on the bridge	• Instructions on how to use a personal life-saving appliance
• IMO Safety Signs	• The most important convention protecting the safety of merchant vessels	• A Code with a description and the technical requirements of appliances for saving lives in an emergency on board.	

1. Safety of Life at Sea: The Convention

I. SOLAS and the LSA Code[1]

The IMO has a Maritime Safety Committee (MSC). It is a senior technical body which has developed and adopted international collision regulations and global standards for seafarers as well as international conventions and codes relating to search and rescue, the facilitation of international maritime traffic, load lines, the carriage of dangerous goods, etc.

The most important of the international conventions dealing with maritime safety is the international convention for the Safety of Life at Sea (SOLAS 74, as amended) which covers a wide range of measures designed to improve the safety of shipping. The convention in force today is referred to as "SOLAS, 1974, as amended": it was adopted in 1974, entered into force in 1980, and has been updated and amended on numerous occasions.

1. Info from the site of IMO (www.imo.org).

Chapter III of SOLAS contains the requirements of Life-Saving Appliances, the description of these appliances and the description of procedures for emergency and routine drills.

In 1996 the International Life-Saving Appliance (LSA) Code was adopted to provide international standards for the testing and technical characteristics of life-saving appliances required by Chapter III of the SOLAS convention. The LSA Code entered into force in 1998. It gives more precise technical requirements for LSAs and is mandatory under SOLAS Regulation 34, which states that "all life-saving appliances and arrangements shall comply with the applicable requirements of the LSA Code".

– The following items are covered by the LSA Code. Write them under the correct heading.

Liferafts
Lifebuoys
Immersion suits
Rocket parachute flares
Smoke signals
Lifeboats
Rescue boats
Hand flares
Lifejackets

Personal life-saving appliances	Survival Craft	Visual signals

II. Amendments to SOLAS '74 – the "Carriage of Immersion Suits" example[2]

When reading (about) regulations and conventions, it is important to understand certain key words, such as:

Amendment:	a change or addition to a convention, a law, etc.
Requirement:	something specified as compulsory

*To give you an illustration of how **amendments** provide new **requirements**, read the following statement, which contains a requirement, and try to decode it by answering the questions.*

> In accordance with SOLAS regulation III/32.3 (effective July 1, 2006) one immersion suit per crew member is required on commercial vessels.

1. Imagine you are an inspector who wants to make sure that a merchant vessel operates under SOLAS. What must you check?
2. Before July 2006, was it compulsory to have one immersion suit for each member of the crew on board?
3. What do "III" and "32.3" refer to?

2. Source: "The May 2004 amendments: Carriage of immersion suits".

4. On "July 1, 2006", was the amendment introduced or did it come into force?

Now read the following background information that explains the amendment behind the requirement, in other words, how the ***new*** *requirement came about.*

In May 2004, the MSC adopted amendments to SOLAS chapter III Regulation 32 – Personal life-saving appliances to make changes to the number of immersion suits to be carried on all cargo ships. The amendments entered into force in 2006 and introduced carriage requirements for one immersion suit per person on board all cargo ships, including bulk carriers. Before that, the regulation required carriage of at least three immersion suits for each lifeboat on a cargo ship, as well as thermal protective aids for persons not provided with immersion suits. With the 2006 amendments, immersion suits became, as lifejackets, a personal life-saving appliance for each person on board, thus offering better thermal protection and improved chance of survival and rescue.

Glossary

adopt	formally accept or approve
facilitation	the act of making easy or easier
amend	to alter and improve formally by adding, deleting or rephrasing, to prepare a new version of
enter into force	coming to have legal force and effect
require	to demand as obligatory or appropriate, oblige to do by force of authority, also, need or call for
precise	exact, detailed, clearly expressed
mandatory	required by law, compulsory, obligatory
comply with	to follow (an agreement or instructions), meet specified standards, act in accordance with a wish or command
applicable	that can be applied, relevant or appropriate
in accordance with	in agreement with, in conformity with
thus	in this way, so

a) Dates are another key item you need to be clear about in relation to conventions. Fill in the correct date, based on the two texts above.

	SOLAS	LSA Code	Amendment on Carriage of Immersion Suits
Adoption:			**May 2004**
Entry into force:	**1980**		

2. IMO Safety Signs

A. *Tick [✓] the correct alternative.*

1. What does this mean?

☐ fasten seatbelts
☐ start engine
☐ secure hatches
☐ release falls

2. What does this mean?

☐ start engine
☐ start air supply
☐ secure hatches
☐ release falls

3. What does this mean?

☐ start power
☐ start engine
☐ secure sprinkler
☐ release air supply

4. What does this mean?

☐ secure hatches
☐ fasten seatbelts
☐ release falls
☐ fasten lines

5. What does this mean?

☐ lower liferaft
☐ lower lifeboat
☐ lower rescue boat

6. What does this mean?

☐ lower liferaft
☐ lower lifeboat
☐ lower rescue boat

7. What does this mean?

☐ lower liferaft
☐ lower lifeboat
☐ lower rescue boat

B. ***Work in pairs. Discuss what the following signs mean.***

(a)


(b)


(c)


(d)


(e)


(f)


(g)


(h)


(i)


(j)


(k)


(l)


(m)


(n)


(o)


(p)


(q)


C. ***Write the correct caption under each sign; use the following lists:***

parachute rocket flares
evacuation slide
EPIRB (distress radio)
lifebuoy with line
immersion suit
survival craft distress signal
fire extinguisher
fire hose
line throwing apparatus
lifejacket
fire alarm
radar-transponder
embarkation ladder
eye wash station
breathing apparatus (EEBD)
muster station
stretcher

3. Safety On Board: Oral Commands

A. ***Listen to oral commands that mention life saving equipment. All the commands are phrases from SMCP, Section B2 "Safety on Board". Circle the words you hear.***

[general emergency activities]

1. Operate the general emergency alarm / fire alarm.
2. All officers to go / report to the bridge.
3. Watchkeepers remain at stations / locations until further order.
4. Take lifejackets / life rafts with you.
5. Take your emergency equipment with you according to the safety list / muster list.
6. Follow the safety routes / escape routes shown.
7. Do not go to the lifeboat stations / lifebuoy stations before ordered.
8. Provide first aid in the vessel's office / hospital.
9. Watchkeepers to assembly / eye rinse stations.
10. Put on your emergency suits / immersion suits.
11. Passengers and crew! Follow the lifeboatmen to the lifeboat stations on the operation deck / embarkation deck.
12. Throw overboard / onboard number 2 liferaft and report.
13. Salvage boat / Rescue boat! Assist number 2 liferaft and report.
14. Report the total number / whole number of persons in liferaft.
15. Fire rockets for embarkation / identification.

[checking status of equipment]

16. Check the lifeboat / liferaft equipment and report.
17. Launch / Release number two lifeboat and report.
18. Replace the liferaft in the next dock / port.
19. Secure the inflation cord / operation cord of number 2 liferaft.

[fire protection and fire fighting]

20. Check the transportable / portable extinguishers and report.
21. Fire on board! Fire fighting team must have protecting clothing, smoke helmets and breathing apparatus / breathing mask.
22. Stand by / Retreat first aid team.

[SAR on-board activities]

23. Man overboard on port side. Drop lifeboat / lifebuoy.
24. Switch on searchlights / toplights.
25. Stand by life-saving apparatus / line-throwing apparatus and report.

4. Location and Purpose of Safety Equipment

I. Where is the safety equipment? – checklists, inventories and safety plans

The Chief Officer (C/O) asks the cadet questions about the safety equipment.

a) Look at the checklist that the C/O is using. Listen and check the things he asks the cadet about.

LSA CHECKLIST
Personal life-saving appliances ☐ Life-jackets ☐ Life-buoys ☐ Immersion suits
Survival Craft ☐ Life-rafts ☐ Lifeboats ☐ Rescue boats
Visual Signals ☐ Rocket parachute flares ☐ Hand flares ☐ Smoke signals
Launching and embarkation appliances ☐ Embarkation ladder ☐ Line-throwing apparatus ☐ General Alarm and PA System
Fire-fighting equipment ☐ Fireman's outfit ☐ Fire blanket ☐ Fire extinguishers

b) Listen again. The C/O is asking about some items that are not on his list. Circle the ones he is asking the cadet about.

– safety plan / fire plan / fire alarm?
– fire drills / abandon ship drills / man overboard drills?
– first aid equipment / hospital / resuscitation equipment?

c) Listen again. What equipment can you find…

…next to the door, in the galley? _____
…behind the chartroom, on the bridge? _____
…in the cabin, inside the cupboard? _____
…on the deck railings? _____
…on the bridge wings? _____
…next to the pilot ladder? _____
…outside the entrance to the accommodation? _____
…in the muster station? _____

d) Where is the safety equipment? Look at the six pictures below. Match the sentences to the pictures, then choose the correct preposition.

1. The lifejackets are **on / in / at** the box.
2. The liferaft is **next to / above / below** the deck railing, in front of the accommodation.
3. The PA speaker is on the wall, **outside / inside / under** the passenger lounge.
4. The children's lifejackets are **to your left / to your right / up the stairs**.
5. The lifebuoy is **on / above / below** the deck railing.
6. The rescue boat is **below / above / next to** the liferafts.

☐

☐

☐

☐

☐

☐

e) Match the sentences to the pictures below and fill in the gaps with the following words.

EPIRB	fire blanket	stretcher	EEBD (Emergency Escape Breathing Device)
Fireman's Outfit	Vessel's Emergency Response Plan		

1. The _____ is in the galley, on the wall, next to the oven.
2. The _____ is in the Fire Station.
3. The _____ is on the wall outside the Fire station.
4. The _____ is in the hospital.
5. The _____ is on the bridge wings.
6. The _____ is in a box in the Fire Station, next to the door, in front of the EEBD.

f) Where are the CO_2 extinguishers on board the vessel? How many are there? Look at the card and talk about the location and number of the CO_2 extinguishers.

e.g. There is one CO_2 extinguisher on the bridge. There is another one... Also…

M/V .....

/03/2008

FIRE EXTINGUISHERS LIST (LAST INSPECTION 09/2007)						
LOCATION	**Q'TITY**	**CAPACITY**	**CO_2**	**FOAM**	**DRY POWDER**	**NR**
ACCOMMODATION / DECK						
BRIDGE	**1**	**5,0 KGR**	✓			1
BATTERY ROOM	**1**	**6,0 KGR**			✓	2
D'DECK	**2**	**6,0 KGR**			✓	3 & 4
C'DECK	**2**	**6,0 KGR**			✓	5 & 6
B'DECK	**2**	**6,0 KGR**			✓	7 & 8
A'DECK	**2**	**6,0 KGR**			✓	9 & 10
BALLAST CONTROL ROOM	**1**	**5,0 KGR**	✓			11
GALLEY	**1**	**5,0 KGR**	✓			12
PROVISION STORE	**1**	**6,0 KGR**			✓	13
FORECASTLE	**1**	**6,0 KGR**			✓	26
UPPER DECK	**2**	**6,0 KGR**			✓	14 & 15

(continued)

LOCATION	Q'TITY	CAPACITY	CO_2	FOAM	DRY POWDER	NR
ACETYLENE	1	6,0 KGR			✓	17
OXYGEN	1	6,0 KGR			✓	18
EMERGENCY FIRE PUMP	1	6,0 KGR			✓	23
AIR CONDITION ROOM	1	5,0 KGR	✓			19
EM/CY GENERATOR ROOM	1	5,0 KGR	✓			21
MAST HOUSE	1	6,0 KGR			✓	24
FIRE CONTROL ROOM	1	5,0 KGR	✓			51
No. 1 PAINT STORE (FORE)	1	6,0 KGR			✓	25
No. 2 PAINT STORE (AFT)	1	6,0 KGR			✓	16
CASING – FUNNEL	1	6,0 KGR			✓	20
STEERING GEAR ROOM	1+2	5,0 KGR &6,0 KGR	✓		✓	28 & 29 + 27
1ST FLOOR	7	6,0 KGR			✓	32-33-34-35-36-37-38
CONTROL RM	1	5,0 KGR	✓			30
WORKSHOP	1	6,0 KGR			✓	31
2ND FLOOR	7	6,0 KGR			✓	39-40-41-42-43-44-45
3RD FLOOR	5	6,0 KGR			✓	46-47-48-49-50
LIFEBOAT	1	2,0 KGR			✓	**22**
RESCUE	1	2,0 KGR			✓	
LIFEBOAT (SPARE)	1	6,0 KGR			✓	**D - DECK**
RESCUE (SPARE)	1	6,0 KGR			✓	**D - DECK**

		IN USE	SPARE	GRAND TOTAL	LAST INSPECTION
CO2	6,0 Kgr	9	9	18	Sep-07
DRY POWDER		43	18	60	Sep-07
NON PORTABLE	135 Ltrs	1		1	Sep-07
	45 Ltrs	1		1	Sep-07
FOAM APPLIC.	20 Ltrs	1	1	2	Sep-07
FIXED S. FOAM	2300 Ltrs	1		1	Sep-06

CHIEF OFFICER

THE MASTER

g) What do the following signs stand for? Complete the missing words.

1. Totally E_____ Type Lifeboat (50 persons) with davit
2. R_____ Boat 6 Persons with Gravity D_____ at Port Side
3. M_____ Station
4. L_____ for Lifeboat and Liferaft
5. S_____
6. Air Compressor for Breathing A_____
7. I_____ Liferaft for 25 Persons and 6 Persons
8. L_____ with Self-Igniting Light and Self-Activating Smoke S_____
9. P_____ VHF Transceiver
10. Satellite E_____
11. Radar T_____
12. Fire F_____ M_____
13. Emergency Escape B_____ Device
14. Life J_____
15. E_____ Ladder
16. I_____ Suit
17. L_____ Throwing Appliance (1 set)
18. Rocket Parachute F_____
19. Direction for E_____
20. F_____ Aid Kit

h) Checking the condition of LSAs: Inventory of Safety Equipment.

An **inventory** is a detailed list or record of items, such as provisions, equipment, etc.

The Third Officer is talking to the Chief Officer about the condition of LSAs. Look at the inventory they are using, listen to the dialogue and...

- fill in the dates that are missing (in the yellow cells).
- circle the equipment that has a short expiry period.

M/V ..... **AT SEA**

PIRAEUS 11526 **DATE :** **/03/2008**

INVENTORY OF PYROTECHNICS AND SAFETY EQUIPMENT			
ITEM	**QTTY**	**MAN. DATE**	**EXPIRY DATE**
BRIDGE			
PARACHUTE SIGNAL RED ROCKETS	12	March-06	Jul-09
LINE THROWING APPLIANCES	4	May-06	_____
MAN OVERBOARD PORT SIDE	1	Apr-06	Jul-09
MAN OVERBOARD STBD SIDE	1	Apr-06	Jul-09
RADAR TRANSPONDERS (BATTERY)	2	Apr-06	Mar-09
EPIRB	1		
EPIRB BATTERY			_____
EPIRB RELEASE			Aug-08
PORTABLE 2WAY VHF (GMDSS)	3	Apr-06	
IMMERSION SUIT	42	Oct-05	_____
BATTERIES FOR 2WAY VHF (GMDSS)	3		_____
FREE FALL LIFEBOAT			
ORANGE SMOKE SIGNALS	2	May-05	May-08
PARACHUTE SIGNAL RED FLARES	2+2	04/2005-06/2006	04/2008-06/2009
HAND FLARES RED	6	May-05	May-08
FOOD RATION	60	Feb-06	Jan-11
FIRST AID KIT	1	Feb-06	_____
LIFE RAFTS:			
			LAST INSP.
MAIN DECK 6 PRSN			Aug-07
BOAT DECK STBD 2 × 20 PRSN			Aug-07
BOAT DECK PORT 2 × 20 PRSN			Aug-07
			EXP.DATE
L.RAFTS HYDROSTATIC RELEASE P			Jun-08
L.RAFTS HYDROSTATIC RELEASE S			Mar-09
			LAST INSP.
BREATHING APPARATUS AIR CYL.BOTTLES	12		Dec-07
			NEXT TEST.
PRESSURE TEST			Aug-10
			NEXT INSP.
E.E.B.D.	**10**	Apr/06	Apr-12
			EXP. DATE
LIFE JACKETS FOR ADULTS			
LIFE JACKET'S LIGHTS	**50**	Nov/05	Nov-10

CHIEF OFFICER **THE MASTER**

Liferafts and "next inspection" stencil painting

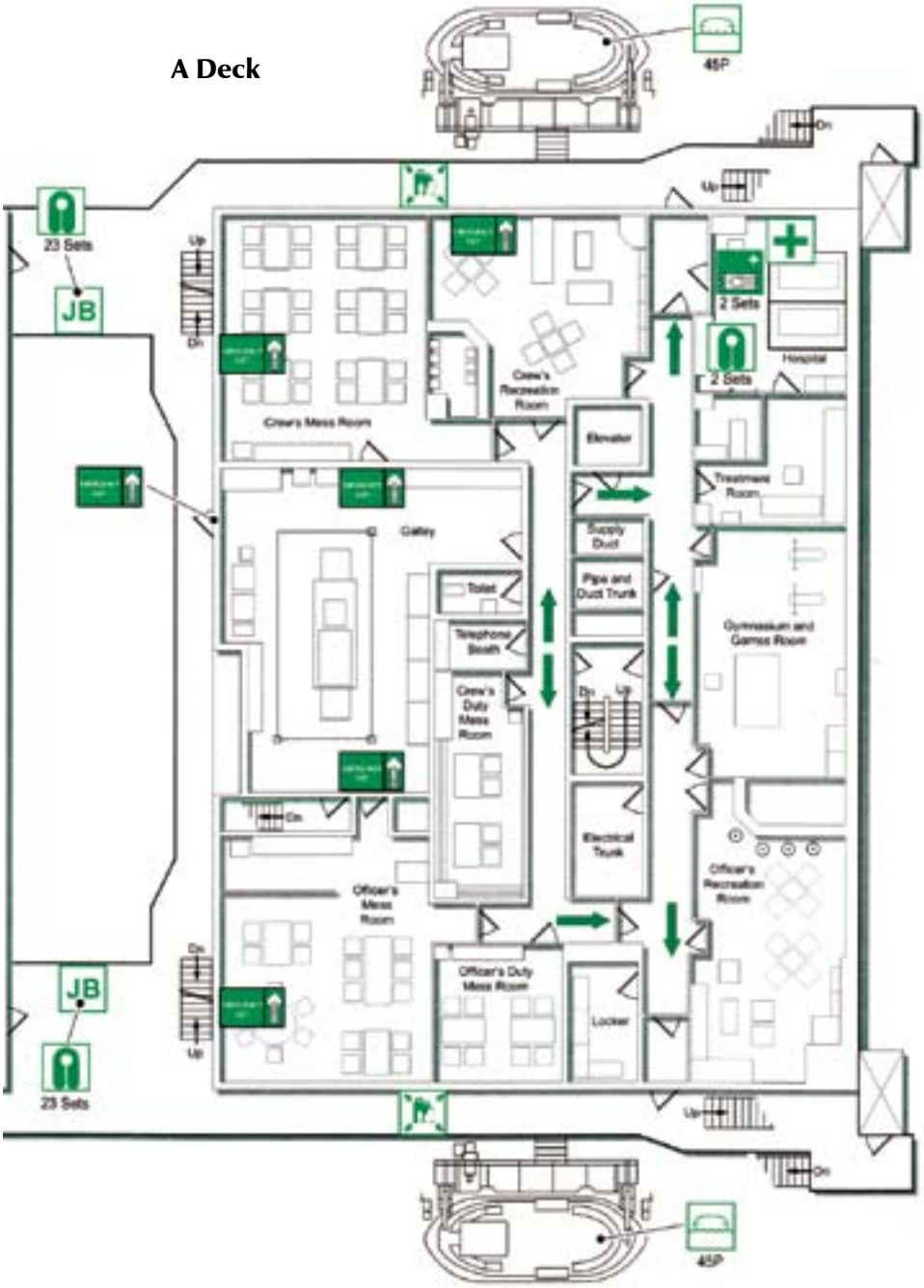
Hydrostatic release unit

i) Look at the plan of A Deck of the LNG ship. Act out a dialogue on the location of Lifesaving Equipment.

Student A: You are the Chief Officer.
Ask the Cadet, *where is / are the lifeboats? How many … are there?*
the lifejackets?
the stretcher?
the first aid kit?
the muster station?

Student B: You are the Cadet.
Look at the plan and answer the questions. Also, wherever you can, give additional information on the number / the capacity of some appliances.

A Deck



II. When do you require life-saving equipment?

a) Fill in the gaps for the appropriate safety equipment.

_____ apparatus: you need it against asphyxia when there is too much smoke in the air

_____ suit: you need it in the cold sea

_____ kit: you need it to take care of a wound / when you are injured

_____ buoy: you need it to float in water

fire _____ : you need it to spray water / powder to a fire to put it out

b) Match the type of life-saving equipment to its function. Fill in the gaps with the words in the box.

lifeboat	MOB lifeboat	free fall lifeboat	
ship-launched lifeboat		life buoy	life raft

A _____ is launched instantly, directly by the ship; it is stored in a slip-way and drops into the water for a quick getaway in case of fire, explosion etc.

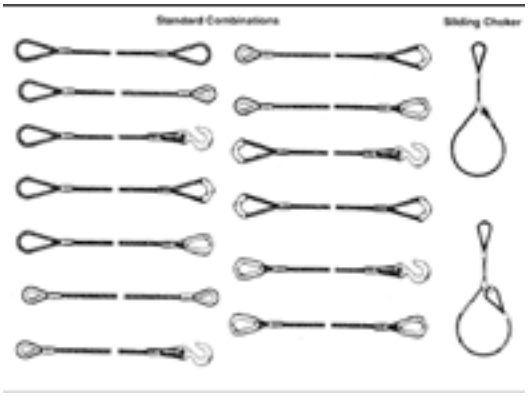
A _____ is a rescue boat we use when there is a man overboard.

A _____ is designed to be lowered with the use of davits on a ship's deck.

A _____ is usually inflatable, it is stored in a container (called canister) aboard a ship, and you need it to save lives in case the vessel has to be abandoned in an emergency at sea.

A _____ is designed to save people who must abandon ship in case of emergency, such as sinking or fire; it is unsinkable, with buoyancy that cannot be damaged, and is constructed to withstand heavy, rough seas.

A _____ is an object that keeps a person afloat; you must throw it after a person overboard, so it is attached to railings close to the water.



Free-fall lifeboat.

Ship-launched lifeboat.

Glossary

inflatable	able to be inflated or blown up, e.g. a boat that can be filled with air
canister	a round or cylindrical container
buoyancy	tendency or capacity to remain afloat in a liquid; the upward force on a body immersed or partly immersed in a fluid
davits	small cranes for lowering a lifeboat
withstand	to remain undamaged by, offer strong resistance to
rough	(of weather or the sea) wild and stormy

5. SOLAS requirements: Surviving Disaster

I. The Titanic and SOLAS

SOLAS is one of the oldest conventions of its kind. The first version was adopted in 1914 following the sinking of the TITANIC. The following graph describes how, nowadays, SOLAS regulations provide better chances of survival to people who find themselves in a disaster at sea[3].

– Match the questions to their answers, based on what you know. Then read the graph on "Surviving Disaster" to check if your answers are correct.

What are the requirements under SOLAS for...

1. the number and capacity of survival craft on passenger ships? ☐
2. sending the ship's position quickly to help locate it? ☐
3. vessels being on stand by to receive a distress call? ☐
4. the communication with the passengers to avoid panic due to lack of information? ☐
5. the construction of lifeboats? ☐
6. making passengers familiar with emergency procedures? ☐
7. training crew in handling lifeboats? ☐
8. making evacuation safer for passengers? ☐

A. The position of a ship in distress can be sent automatically via EPIRB.
B. There should be enough lifeboats for all passengers, plus liferafts for 25%.
C. All ships must have a PA system.
D. Every ship while at sea must keep a continuous watch on the distress and safety frequencies.
E. All lifeboats must be enclosed, at least partially, to protect against the cold.
F. There must be emergency evacuation slides for passengers.
G. Passengers must attend fire drills and abandon ship drills.
H. The crew must participate in regular practice drills.

3. "Ship Safety – the Titanic & SOLAS (graphic)".

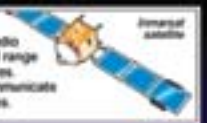
Surviving disaster – The Titanic and SOLAS

In 1914, two years after the Titanic disaster of 1912, in which 1,503 people lost their lives, maritime nations gathered in London adopted the International Convention for the Safety of Life at Sea (SOLAS Convention), taking into account lessons learned from the Titanic. The 1914 version was superseded by SOLAS 1929, SOLAS 1948, SOLAS 1960 (the first adopted under the auspices of the International Maritime Organization) and SOLAS 1974. SOLAS 1974 is still in force today, but it has been amended and updated many times. The regulations relating to life saving appliances and arrangements, contained in chapter III of SOLAS, a new version of which entered into force on 1 July 1998, are intended to ensure that in the event of a catastrophe at sea, passengers and crew have the greatest chances of survival. Improved design and equipment, better fire protection, satellite communications, rescue planes and helicopters and trained personnel also contribute to improved safety at sea.

IMO

Distress alert

The Titanic used radio which had a limited range of 200 nautical miles. Ships can now communicate globally via satellites.



Helicopters and rescue planes

Unavailable in 1912, helicopters and rescue planes are now used to locate, search for and rescue survivors.

Ice patrol

In the first SOLAS 1914, after the Titanic disaster, ice patrols in the north Atlantic were set up and continue to be a SOLAS requirement.

Speed of navigation around ice

The Commission into the Titanic ruled the loss was due to collision with an iceberg brought about by excessive speed at which she was being navigated.
Under SOLAS, when ice is reported on or near his course the master of every ship at night is bound to proceed at a moderate speed or alter course.

Lifeboat drill

No lifeboat drill was held on the Titanic. Under SOLAS chapter III an 'abandon ship' and fire drill must take place weekly on all passenger ships.

Evacuation chutes

Passengers on the Titanic jumped from windows and doorways into the lifeboats as they were lowered, often injuring themselves or other passengers.
New emergency evacuation chutes are both safer and quicker.

Public address system

There was no public address system on the Titanic and news filtered to the passengers slowly, adding to the disorder and confusion.
Under SOLAS, all passenger ships must be fitted with a public address system.

Training of crew in lifeboat drill

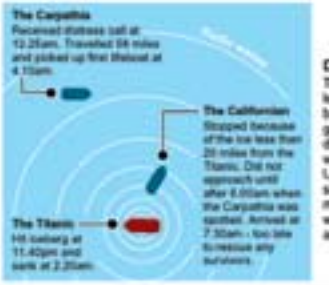
The crew of the Titanic lacked training in loading and lowering the lifeboats and few knew which boat they were assigned to. Lifeboats were not filled to capacity because senior officers did not know the boats had been tested and were strong enough.
Under SOLAS, every crew member must participate in regular practise drills and have easy access to training manuals.

Number of lifeboats

The Titanic did not have enough lifeboats for all passengers.
Under SOLAS, passenger ships must carry enough lifeboats (some of which can be substituted by liferafts) for all passengers, plus liferafts for 25%.

Location

The land station at Cape Race, Newfoundland and ships other than the Carpathia and the Californian heard the Titanic distress call but the airwaves were crackling and the Titanic's position was misinterpreted. With EPIRBs and global positioning systems, the position of a ship in distress can be automatically sent.



Distress watch

The Californian was less than 20 miles away but the radio officer had gone off duty when the distress messages were sent.
Under SOLAS, every ship while at sea must maintain a continuous watch on the distress and safety frequencies.

Lifeboat design

Some people died from hypothermia in the Titanic lifeboats because they were open and gave no protection against the cold.
Under SOLAS, lifeboats must be fully or partially enclosed. On passenger ships, partially enclosed lifeboats can be used as they are easier to get into, but they must have a collapsible roof to fold across.

Immersion suits

The sea temperature when the Titanic sank was below freezing point and many people died in the water from hypothermia.
Under SOLAS, a specific number of immersion suits must be carried on both passenger and cargo ships, mainly for the crews of rescue boats.

Glossary

supersede	to take the place of
under the auspices of	with the support or protection of
intend(ed) to	designed for a particular purpose, having as an aim to
ensure	to make certain that something will occur or be so
contribute to	to help to cause, bring about, help to achieve or provide something
substitute by	to replace with another, use in place of
via	by means of, by way of, through
misinterpret	to understand wrongly
evacuation chute	a long slide or inclined passage used to evacuate passengers
limited range	restricted distance within which (the radio) is able to operate or be effective

II. Titanic life jacket

– Titanic life jacket up for sale[4]. Listen to a Reuters report. The news story is about auctioning a life jacket from the Titanic at Christie's. Answer the following questions. Note down your answers while listening.

1. What is the expected price for the life jacket at the auction?

   . . . . . .
   . . . . . .

2. Why are artifacts from the Titanic rare? What happened to the objects that were not lost at sea?

   . . . . . .
   . . . . . .

3. How many life jackets from the Titanic are remaining?

   . . . . . .
   . . . . . .

4. What were the port of origin and the port of destination of the Titanic?

   . . . . . .
   . . . . . .

5. What other items from the Titanic are for sale in the auction?

   . . . . . .
   . . . . . .

6. What is another word for "life jacket" that the reporter uses?

   . . . . . .
   . . . . . .

Life jacket from the Titanic.

4. Reuters Report by Fred Katayama, New York, June 19, 2008 "Titanic life jacket up for sale".

III. Describing survival equipment in writing

– Choose one of the following appliances to describe in writing. Write about its shape, colour, construction material and any other characteristics. Where do you find it? What is its purpose? How do you use it?

…it is inflatable…
…it gives you buoyancy…
…it has a whistle and a light…
……..
…it keeps you afloat…
…it is red and round…
…it has a carrying capacity of 25 people…

IV. Lifeboat drills

a) Listen to the two interviews and tick the topics the cadets mention in each one.

	Interview 1	Interview 2
Master Messenger		
SART (Search and Rescue Transponder)		
Portable VHF (used to communicate with other vessels)		
Muster List Station		
Master supervises the operation from bridge		
A/Bs (and messmates) lower the boats		
Designated Officer for safety drills is Chief Officer		
How often drills take place		
Duration of drills		
Immersion suit		

b) Fill in the blanks. The first letter of each missing word is given.

1. The first thing you learn as a cadet is where your m_____ station is.
2. The Master s_____ drills from the bridge.
3. The role of the Master's m_____ is to transfer information from the bridge to Officers. Nowadays, of course, there is VHF bridge-to-crew communication to do this.
4. The Chief Officer is responsible for all the drills, since s/he is the S_____ Officer.
5. The Cadet must o_____ the lowering operation and assist A/Bs if necessary.
6. When you enter the lifeboat you f_____ your seat belt.

Lowering the lifeboat.

Round-up

A. Self-assessment.

How well can you talk in English on the following topics? Tick ☑ accordingly and give as many examples as possible.

Very well	moderately well	poorly	
☐	☐	☐	Personal LSAs and survival craft
☐	☐	☐	Where safety equipment is on board
☐	☐	☐	Conventions on safety
☐	☐	☐	SOLAS requirements
☐	☐	☐	IMO safety signs

B. Class Project.

Choose one of the following to present in class:

- Find out more about the history of SOLAS and its various parts.
- Research another convention that relates to safety, the **International Convention on Maritime Search and Rescue (SAR) 1979**.
- Free-fall lifeboats: How do they operate? What are their advantages and disadvantages? How widely are they used in comparison with conventional lifeboats?

C. Fill in the correct prepositions.

via	to	per	under	with	in	against	from

1. This appliance offers protection _____ the cold.
2. People can die in the water _____ hypothermia.
3. _____ accordance with your instructions, we will relocate the equipment.
4. The company must make sure to comply _____ international regulations.
5. _____ SOLAS, lifeboat drills are obligatory.
6. Nowadays, ships communicate _____ satellites.
7. The technical characteristics are applied as _____ regulations.
8. According _____ new standards, all officers must be fluent users of English.

D. Cross the odd word out.

1. It takes many years for the MSC to **adopt / amend / release / update** conventions.
2. You must practise on how to **release / lower / inflate / reduce** a liferaft.
3. An international **convention / treaty / agreement / awareness** is adopted by many governments.
4. Various installations on board achieve fire **protection / comprehension / detection / extinction.**
5. You must maintain life-saving **applications / appliances / devices / equipment** regularly.
6. Can you check when the **inspection date / arrangement date / expiry date / manufacture date** is?

UNIT 5

Work Activities On Board

1. *The Voyage Route*
2. *Nautical Charts and Aids to Navigation*
3. *What is happening on board now?*
4. *Daily Routines*
5. *Standard Engine Orders*

Round-up

1. The Voyage Route

"1000 nautical miles in the Mediterranean"

Listen to the Chief Officer describing the charted route to the Captain and do the exercises that follow:

A. *Draw the route on the map.*

B. *Listen again and circle the correct distance.*

Passage Plan

From	To	Distance (in nautical miles)
Genoa	Marseille	204 / 240 NM
Marseille	Barcelona	207 / 211 NM
Barcelona	Valencia	130 / 180 NM
Valencia	Cartagena	122 / 172 NM
Cartagena	Gibraltar	237 / 277 NM

Glossary

Traffic Separation Scheme (TSS)	a routeing measure which separates opposite streams of traffic and establishes traffic lanes

circumstances	conditions or facts connected with an event or action, information that should be kept in mind when making a decision
ordnance exercise	naval firing practice
deviate	to change the direction or course of; diverge from an established course

C. *Latitude and Longitude.*

1. Listen and fill in the Latitude and Longitude of the following European capital cities.

	City, Country	Latitude	Longitude
1.	Helsinki, Finland	°N	24°E
2.	Stockholm, Sweden	°N	°E
3.	Copenhagen, Denmark	°N	°E
4.	Amsterdam, the Netherlands	°N	°E
5.	London, UK	51°N	°W
6.	Lisbon, Portugal	°N	9°W
7.	Madrid, Spain	°N	°W
8.	Bern, Switzerland	°N	°E
9.	Rome, Italy	°N	°E
10.	Athens, Greece	°N	°E

2. *Student A:* Listen to your study partner and fill in:

	City, Country	Latitude	Longitude
1.	Genoa, Italy		
2.	Marseille, France		
3.	Barcelona, Spain		
4.	Valencia, Spain		
5.	Cartagena, Spain		
6.	Gibraltar		

Student B: Go to page 492. Say the information to your study partner. Then check if s/he has filled it in correctly.

2. Nautical Charts and Aids to Navigation

– **Navigation(al) aid**: An onboard instrument, device, chart, method, etc., intended to assist in navigation.

– **Aid to navigation**: A device or structure external to the ship, designed to assist in determining the ship's position, define a safe course, or warn of dangers or obstructions.

A. ***Close listening. Listen carefully to the following passage from an interview and correct the mistakes. Identify which five words are incorrect, even though they sound similar to the correct ones.***

"Nautical charts contain information about the shape of the coast, the lengths of the water and the general configuration of the button of the sea floor. Nautical charts also show locations of obstacles to navigation, the rise and fall of the tights, and locations of navigation gates. Nautical charts make safe and efficient marine transportation possible."

– Aids to Navigation

a) Fill in the blanks with the words in the box.

hazards	floating	location	conformance	navigate

Aids to Navigation

Unlike the roads and highways that we drive on, the waterways we go boating on do not have road signs that tell us our (1)_____, the route or distance to a destination, or of (2)_____ along the way. Instead, the waterways have AIDS TO NAVIGATION (or ATONs), which are all those man-made objects used by mariners to determine position or a safe course.

The term "aids to navigation" includes buoys, day beacons, lights, lightships, radio beacons, fog signals, marks and other devices used to provide "street" signs on the water.

The term "aids to navigation" encompasses a wide range of (3)_____ and fixed objects (fixed meaning attached to the bottom or shore), and consist primarily of:

- **Buoys** – floating objects that are anchored to the bottom. Their distinctive shapes and colours indicate their purpose and how to (4)_____ around them.
- **Beacons** – structures that are permanently fixed to the sea-bed or land. They range from structures such as lighthouses, to single-pile poles.

Aids to navigation systems are in (5)_____ to the International Association of Lighthouse Authorities (IALA), which is an international committee that seeks to ensure safe navigation, primarily through the use of common navigation aids and signals.

Buoy: Safe Water Mark

Glossary

determine	ascertain or establish definitely by calculation
encompass	include or contain comprehensively
attach	fasten, join
primarily	mainly, chiefly
distinctive	individually characteristic, distinguishing

pole	rod, post
odd numbers	1, 3, 5, etc. (not divisible by two)
even numbers	2, 4, 6, etc. (divisible by two without a remainder)
isolated	remote, separated from others

b) Look at the nautical chart on the next page and identify the following aids to navigation / information in it. Use the list below and put the correct number in the boxes shown on the map. Consult the appendix on Nautical Chart Symbols (page 521) for help.

1. Anchorage prohibited / Restricted Area
2. Limit of safety zone around off-shore installation (oil-rig)
3. Traffic flow direction (mandatory)
4. Dangerous wreck, depth unknown, with danger mark west
5. Oil / Gas pipeline
6. Spring in Seabed
7. Tanker anchorage area
8. Pilot
9. (part of) Compass Rose
10. Separation line
11. Tower
12. Road
13. Airport
14. Sandy shore
15. Submarine cable
16. Mooring buoy

3. What is happening on board now?

A. The Chief Officer is talking to the Second Officer. What is happening on board now? Listen and match.

1. The Third Officer
2. The Cadet
3. The Bosun
4. Marcus (OS)
5. Ruperto (OS)
6. Danilo and Bayani (ABs)

__ is supervising the ABs
__ are lowering the embarkation ladder
__ is washing the deck
__ is greasing the anchor chain
__ is checking the liferafts
__ is helping the Third Officer

B. Look at the previous exercise. Write questions and give the correct answers.

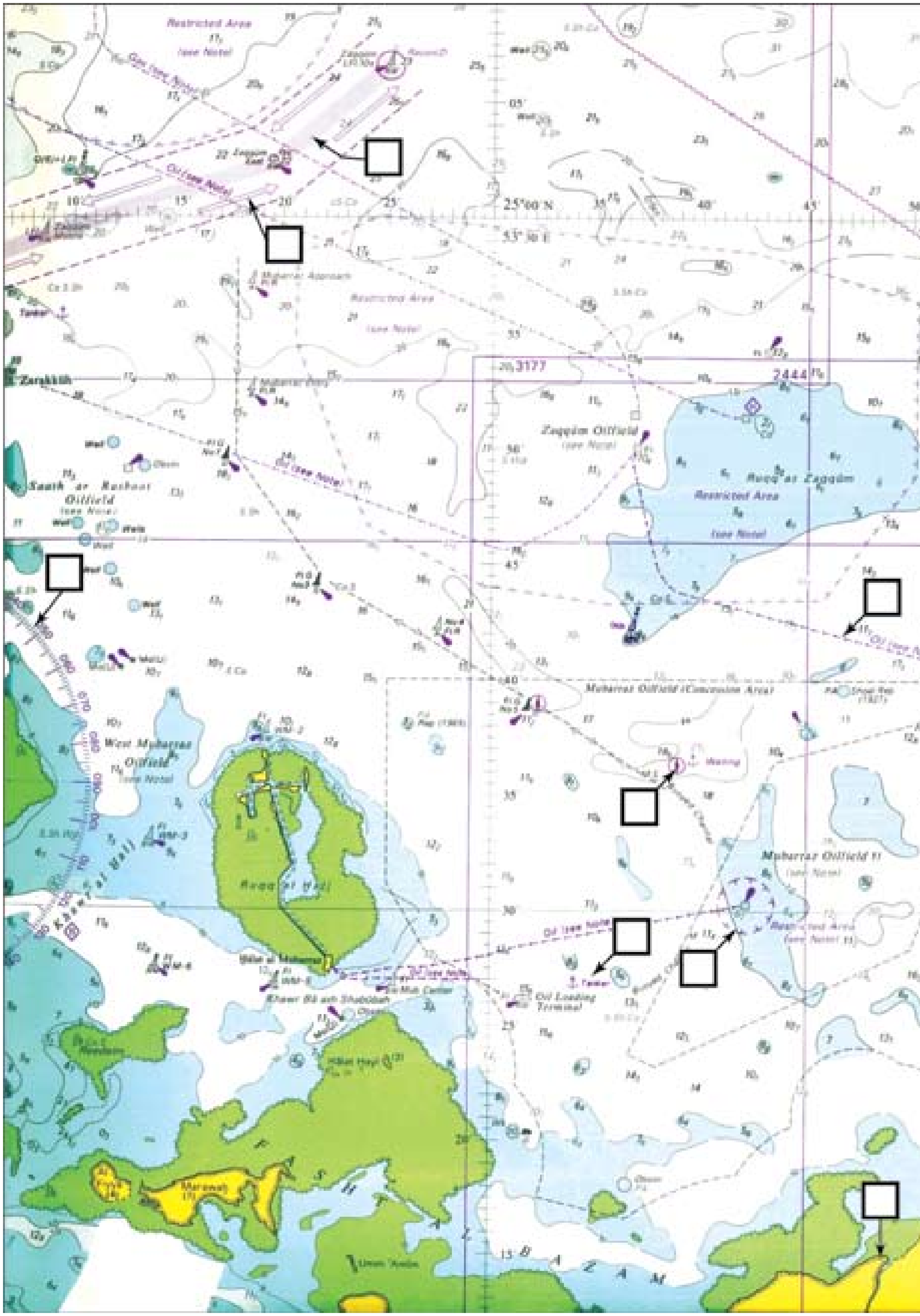
1. Bosun / read a newspaper?
Is the Bosun reading a newspaper?
No, he isn't. He is supervising the ABs.

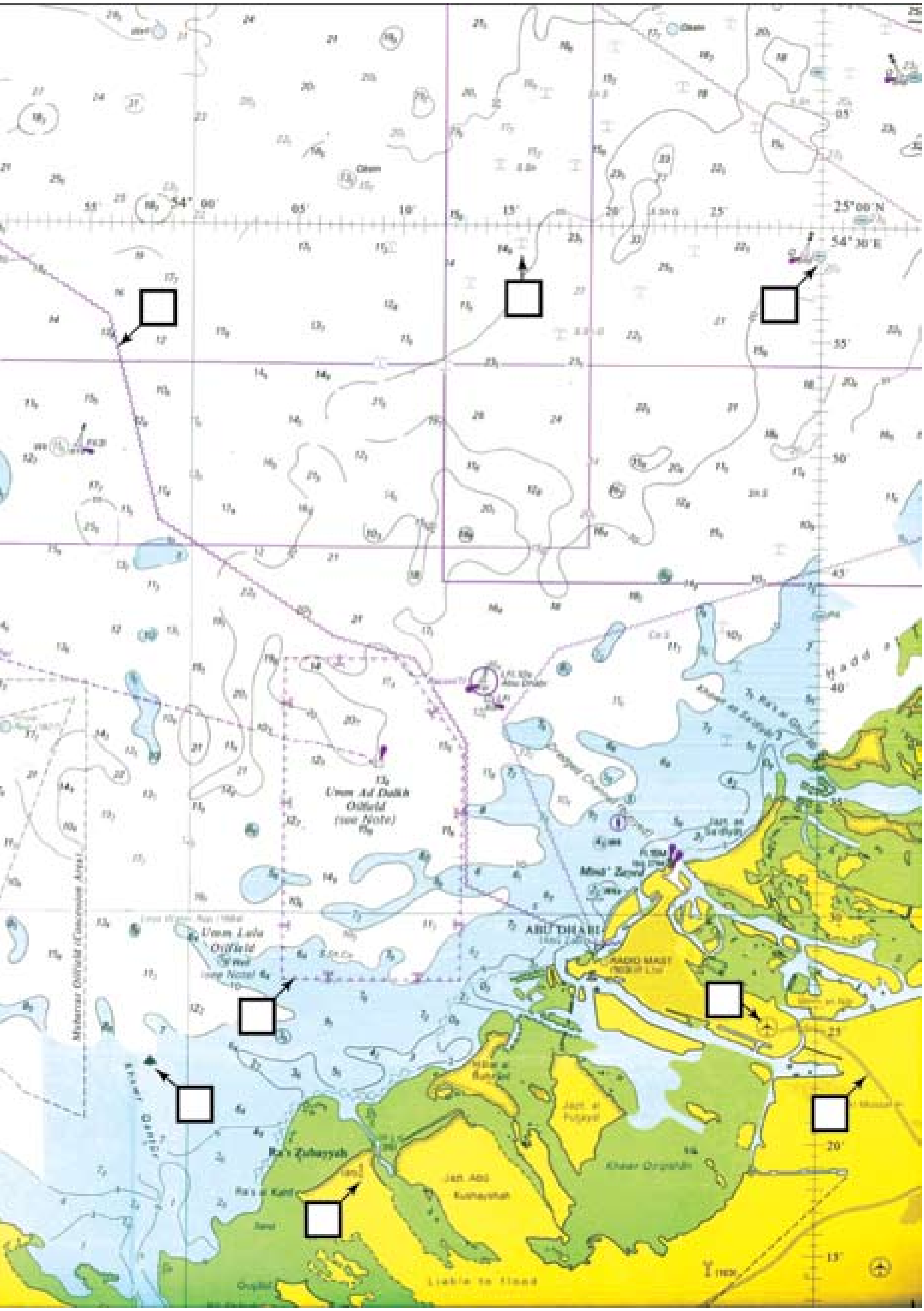
2. The cadet / wash the deck?
. . . . . .
. . . . . .

3. ABs / prepare for a fire drill?
. . . . . .
. . . . . .

4. Third Officer / correct the charts?
. . . . . .
. . . . . .

5. The Chief Officer / call from the bridge?
. . . . . .
. . . . . .


Restricted Area
(see Note)
Gas (see Note)
Oil (see Note)
25°00'N
53°30'E
3177
2444
Zaqqum Oilfield
Restricted Area
Mubarras Oilfield (Concession Area)
West Mubarras Oilfield
Mubarras Oilfield
Oil Loading Terminal
Marawah


54° 00'
25° 00'N
54° 30'E
Umm Ad Dalkh
Oilfield
(see Note)
Umm Lulu
Oilfield
ABU DHABI
Mina' Zayed
RADIO MAST
Ra's Zubayyah
Liable to flood

C. *What are the crewmembers doing? Match the sentences to the pictures.*

Note: *For information regarding the Present Continuous tense go to page 522.*

They are painting the hold.	They are correcting the charts.
He is washing the deck.	He is looking through the binoculars.

(a) 

(b) 

(c) 

(d) 

– *Work routines / activities taking place on board*

What is happening on deck?

The crew members are having a drill preview meeting.

a) What is happening? Write up the sentences and then match them to the pictures below.

1. I _____ (chip) the rust off.
2. The engineers _____ (prepare) a new cylinder liner.
3. The ship _____ (pull) alongside for an STS (ship-to-ship) operation.
4. A crewmember _____ (demonstrate) the use of an immersion suit.
5. A rating _____ (paint) the deck.
6. A rating _____ (wash) the anchor.

☐ 

☐ 

☐ 

☐ 

☐ 

☐ 

b) What are they doing? Use the verbs in the box to complete the sentences.

carry out	clean	complete	print	supervise
~~inspect~~	brief	operate	make	check

1. The Third Officer ***is inspecting*** the holds.
2. The Bosun _____ the maintenance works on deck.
3. A surveyor _____ an inspection.
4. The ratings _____ the tanks.
5. The Master _____ the crew on new safety regulations.
6. The Chief Steward _____ an announcement.
7. The Cadet _____ some documents.
8. The Deck Officers _____ the containers for damage.
9. The Third Engineer _____ the engine logbook.
10. The ABs _____ the cranes.

c) Imagine you are working on a passenger ferry. The vessel is preparing to get underway. What activities are taking place on board? Talk about who is doing what.

e.g. The First Officer is giving orders via the VHF to manoeuvring stations.
A rating is …….. / Some crewmembers are ……..

- put the windlass in gear
- prepare to heave up anchor
- wait for traffic clearance from the port
- let go the head line
- check passenger tickets
- wait for engine orders from the bridge for un-berthing
- search for stowaways
- secure cars and trucks
- fold and secure the bow ramp

d) What is happening on the MV Troop? Use the pictures, the prompts below and your own ideas to write what activities the crewmembers are engaged in.

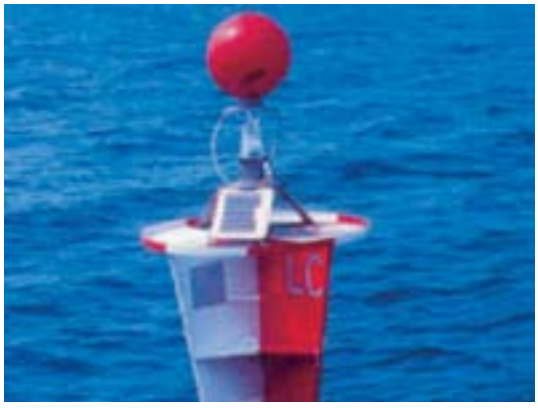
Fasten the ropes / Load food supplies / Prepare the stowage plan / Supervise bunkering / Cook dinner / Mop the floor in the cabins / Drink coffee / Speak on the phone…

On the MV Troop someone is .....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

e) What is happening in each picture? Use the phrases in the box to finish the sentences and match them to the pictures on the next page (put the correct number in each box). Use the Present Continuous.

paint under the bridge wing	complete the logbook	tow a heavy lift ship	hold the fire hose
prepare the lifeboat for embarkation	~~put on a breathing apparatus~~	work on the winches	let go the tug

1. In order to take part in the fire drill, the O.S. ..... is putting on a breathing apparatus ...
2. The firemen .....
3. At the aft mooring station, the crewmembers .....
4. Up on the davit ladder, the Chief Mate and two crewmembers .....
5. The tug boat .....
6. Look! This must be very difficult. The A.B. .....
7. The Bosun with two ABs .....
8. On the bridge, the 2nd Mate .....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4. Daily Routines

A. ***The third officer talks about his day. Listen and note down his daily routine.***

1. ____*0730*____ Get up
2. _____ Have breakfast
3. _____ Start 1st watch
4. _____ Drink coffee
5. _____ Eat lunch
6. _____ Discuss with Captain
7. _____ Sleep
8. _____ Start 2nd watch

Note: *For information regarding the Present Simple tense, go to page 523.*

B. ***Say what he does.***

e.g. The 3rd Officer gets up at 0730.

C. ***Listen to a person talking about his daily work routine.***

– Write the activities next to the times:

inspect vessels	go to office in port and arrange the schedule for the day
lunch break	review meeting with other inspectors

08.00 _____
09.00 _____
12.00 _____
13.00 _____
17.00 _____

– Answer the questions:

Who does the speaker work for?
.....
How does he go to work?
.....
How many inspections does he perform per day?
.....
What does he do during each inspection?
.....

D. ***What about you? Note down your own work timetable for Mondays, and tell your partner about it.***

e.g. I have Mathematics from 0815 till 0900, then I have a short break.

E. ***Match the questions to the answers. Then practise the dialogue with your partner and say it aloud without looking at your book.***

1. What do you do?	___ Yes, usually in the morning, from about 0800 to 1330.
2. Do you have classes every day?	___ By bus.
3. How do you go to the Academy every day?	___ I am a student. I study at the Merchant Marine Academy.
4. What time do you have a break?	___ Around 1030.

F. ***Fill in the gaps. Use the Present Continuous or Present Simple tense of the verbs in brackets.***

"***My Cadet's Journal***"

22 March Today is my second day on the ship. I am overwhelmed. Everything is so different and I ……. (try) to adapt to the way of life here. I ……. (learn) very fast. Although I ……. (not/understand) the way of thinking of the rest of the crew (they share some kind of special code of communication), I believe I am gradually fitting in. Right now, the Chief Engineer ……. (sit) with the Master in the officers' lounge. They ……. (discuss) the overall performance of the crew. I ……. (not/know) if they are talking about me.

25 March The Second Engineer is Polish. He ……. (speak) English very well and he is trying to teach me the names of tools. Every time he ……. (say) a new word, I try to repeat it.

30 March It's my birthday today. The Cook ……. (make) me a cake and we ……. (have) a small party in the officers' lounge. It's weird: I ……. (celebrate) my 20th birthday with a group of men on a ship! I feel my life ……. (change) a lot these days!

7 April We are in the port now. Everybody is terribly busy. The Master ……. ……(meet) port officials and agents.
The deck officer ……. (supervise) loading.
The engineers ……. (strip down) and ……. (overhaul) the machinery.
I'm in my cabin because I have the flu.

Note: *For information comparing the Present Simple and Present Continuous tenses, go to page 524.*

G. ***Read the text about a young seafarer's experience. There are four clauses missing in the text. Choose from the box below to fill them in.***

a. but the times that you get to spend together when you see them is like gold to you
b. so it actually feels like they are there with you
c. and also look forward to future plans that may happen
d. when you do actually get into port and send them

You can pretty much guarantee that my life each day on the 4-8 watch involved the same things, day after day after day. You get yourself into a routine and everything just starts to happen automatically after time. […]
Anyway my daily routine when on the 4-8 watch was basically set out as follows:
0330 – Wake up and get ready for watch.
0400 – Bridge or Cargo Watch commences.
0800 – End of Watch.
0815 – Breakfast, usually by myself.
0930 – Study.
1000 – Morning cup of tea.
1200 – If not doing safety checks or study then may have lunch.
1500 – Afternoon nap.
1530 – Wake up and get ready for Bridge or Cargo Watch.
1600 – Bridge or Cargo Watch commences.
2000 – End of Watch.
2015 – Dinner, usually by myself.
2030 – Study.
2200 – Try and be asleep before clock reads 2200.
Don't you get bored of routine? What do you do to relax? Do you ever become complacent? These are just some of the many questions I get when explaining deep sea life to my friends and family. Going deep sea you get a lot of time to reflect back on your own life (1)_____ _____. I had a friend who went deep sea for a few months and planned an entire world trip for him and his wife when he hopped off. The amount of time you get to pay attention to detail is incredible. Having no distractions around you so that you are able to focus on what you enjoy the most and having beautiful scenery to relax in at the same time makes it all worthwhile. Sure you do miss your friends and family with being away for so long, (2)_____ _____. You resort back to the old fashioned hand written snail mail letters which take a week or two to get back home (3)_____. Nowadays though most ships have caught up on the latest technology and internet accessible throughout most of the world. E-mailing and even Skype. You can talk and see your friends and family while you are away on the ship (4)_____[1].

Glossary

commence	to begin, start
bored	uninterested, feeling weary and impatient because you have no interest in your current activity
complacent	self-satisfied and unconcerned, contented to a fault
reflect (on/upon)	to think deeply or carefully about
entire	whole, with no part left out
incredible	impossible or hard to believe
distraction	a thing that diverts attention
worthwhile	worth the time, money or effort spent
Skype	a software application that allows users to make voice calls over the internet; it also offers messaging and video conferencing

1. "4-8 on a Coastal Product Tanker" by Megan Stewart, "Young Woman Seafarer" Blog at Blogspot.com.

5. Standard Engine Orders

Lead-in.

i. Read the following text and choose the correct alternative for the missing words.

> The ***Engine Order Telegraph*** is a device that communicates (a) _____orders from the navigation bridge to the engine room.
> It consists of a command unit, for making settings and for the (b) _____ of orders from the wheelhouse to the engine room, and an executive unit for acceptance and (c) _____ of the received order.

a) speed / safety / cargo
b) shipping / transmission / transportation
c) certification / confirmation / documentation

ii. Which of the following are engine orders?

a) Dead slow astern.
b) Starboard, steer zero eight two.
c) Full ahead.
d) Stand by engine.
e) Hard-a-port.
f) Maximum revolutions ahead are 55.

A. *Fill in the gaps using the following words.*

engine	pushbutton	normally	lever
astern	stand	control	displays

Engine telegraph unit[2]

Telegraph types

The engine telegraph is a fully integrated part of the propulsion control system. Both (1)_____ and (2)_____ type units are available.

Lever type telegraph

The lever type engine telegraph is used on the bridge, enclosed bridge wings and in the engine control room. It includes three text (3)_____ and LED indication to give instant view of selected telegraph position. Push-buttons to select sub telegraph mode and for control transfer are also included.

Pushbutton type telegraph

In the engine room and on open bridge wings pushbutton telegraphs are (4)_____

2. Source: "The Auto Chief C20 Engine Telegraph Unit".

used. This unit includes push-buttons to select telegraph position, sub telegraph mode and for control transfer.

Engine telegraph positions

- Ahead: Dead slow, slow, half, full, navigation full
- Stop
- (5)_____: Dead slow, slow, half, full, emergency astern

Sub-telegraph modes

- Finished with (6)_____ - FWE
- (7)_____ by
- At sea

Available control locations

- Bridge / bridge wings
- Engine (8)_____ room - ECR
- Local
- Optional, other locations

Lever type engine telegraph

B. ***What can you see in each of the following pictures?***

1. an engine order telegraph throttle lever
2. a pushbutton propulsion (engine) telegraph
3. a traditional round-dial Engine Orders Telegraph

(a)

(b)

(c)

C. ***Fill in the dial indications / positions of an Engine Order Telegraph.***

Write: HALF, FULL, STOP, SLOW, DEAD SLOW

AHEAD	**FULL**
	SLOW
	FINISHED WITH ENGINES
	DEAD SLOW
ASTERN	
	HALF

D. ***What do the engine orders mean? Fill in the meaning for each order. Choose from the box below and use the pilot card[3] on the next page wherever you need a particular. Then, practise saying and repeating them.***

ORDER	MEANING
Full ahead	
Half ahead	_____ revolutions (as indicated in ship's orders)
Slow ahead	_____ revolutions
Dead slow ahead	_____ revolutions
Stop engine (s)	
Dead slow astern	_____ revolutions
Slow astern	_____ revolutions
Half astern	_____ revolutions
Full astern	_____ revolutions
Stand by engine(s)	
Finished with engine(s)	

• No engine revolutions
• Engine Room personnel fully prepared to manoeuvre and Bridge manned with personnel to relay engine orders
• Maximum manoeuvring engine revolutions for ahead propulsion
• Movement of engine(s) no longer required

3. Charleston Container Terminal Simulation Study, p. 21.

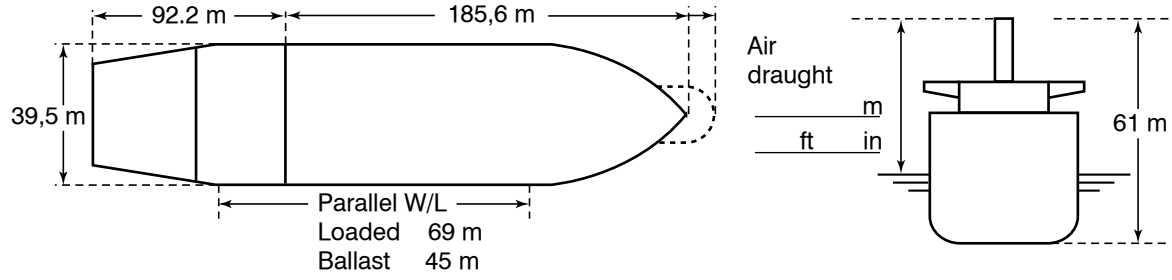
PORT: CORYTON, UK DATE OF ISSUE: 16 JUNE 2008 M/T “NERO”

PILOT CARD

Call sign: KZGY	Summer Deadweight: 117055 tonnes	Year built: 2006
Draught: AFT 8.40m	FORWARD: 6.40m	Displacement: 61001.0 tonnes.
Squat: 1.64m	Min UKC: 5.46m	Position of Min UKC: OUT OF BERTH

SHIP’S PARTICULARS

Length overall 249.9m	Breadth 44.09m	Bulbous bow Yes ☒ /No 0
Anchor chain:		
Port 13 shackles	Starboard 13 shackles	Stern N/A shackles



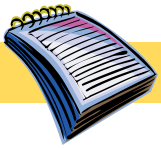
Type of Engine SULZER 12RTA		Maximum Power 40.000 kW (55.400 HP)	
Manoeuvring engine order	RPM / pitch	Speed (knots)	
		Loaded	Ballast
Full ahead	87	13.40	14.95
Half ahead	68	10.65	12.12
Slow ahead	52	8.11	9.33
Dead slow ahead	32	5.51	6.12
Dead slow astern	32	Time limit astern	min
Slow astern	52	Full ahead to full astern	9m 30s
Half astern	68	Max.no.of consec. starts:	23
Full astern	87	Minimum Rpm 24.5	4.96 knots
		Astern power	51% ahead

NOTE : IN ORDER TO MAKE ASTERN THE SPEED MUST BE LESS THAN 6Knts

As soon as possible, after the pilot has boarded the vessel, the Master and Pilot will discuss the following issues:

- The responsibilities of each bridge team member
- Identify the members of the bridge team with English proficiency
- Waterway characteristics such as depths, type of bottom, under keel clearances, currents, tides and anchoring areas
- Ship-to-shore communication procedures
- Expected weather and traffic
- Local traffic management rules and requirements

The Master _____ The Pilot _____



Glossary

integrated	part of a larger unit
lever	a projecting arm or handle that is moved to operate a mechanism
LED (light emitting diode)	an electronic light source used as indicator lamp in electronics
instant	immediate
includes	contains as a part of a whole
select	to carefully choose the best or most suitable
mode	a given condition of functioning, a way in which something is done
transfer	moving something from one location to another
optional	possible, available as a choice
throttle	a device controlling the flow of power or fuel to an engine
manned	having a crew
relay	to receive and pass on (a message, information etc.)

Round-up

A. Self-assessment.

How fluently can you …

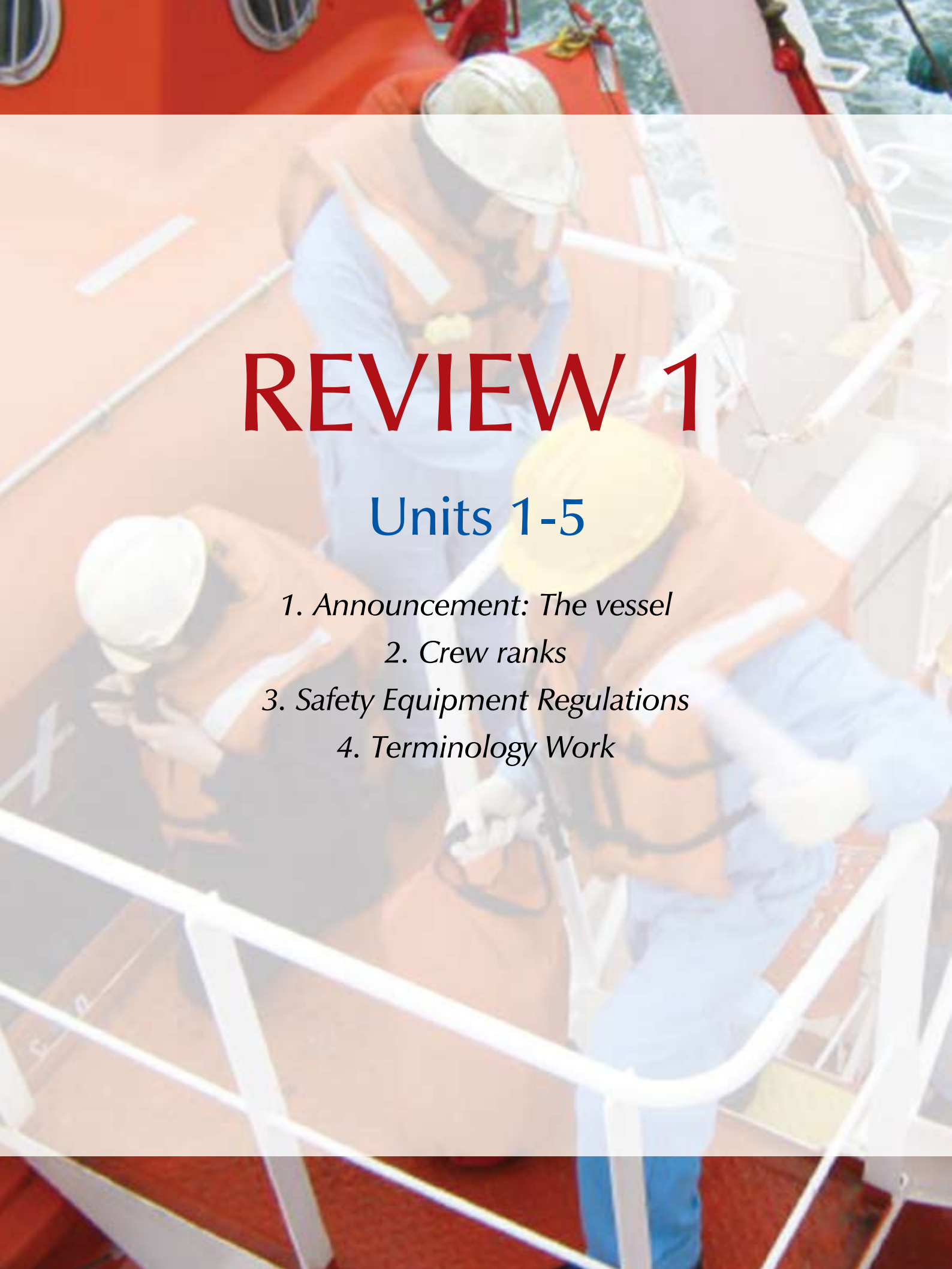
very	moderately	a little	
☐	☐	☐	• talk about work activities in progress? Give examples. What **are** different crewmembers do**ing**?
☐	☐	☐	• give and understand Standard Engine Orders?

B. Class Project.

- What elements make up the Propulsion Telegraph System of a vessel? Find out more about different types of control panels and stations, and the meaning of "bi-directional communication".
- Find out more about the communication between Bridge and Engine Room: compare the current modes of communication to the ones used in the past. Is the procedure and technology for the reception and acknowledgement of orders different now?

C. Word-building. Write the correct derivative of the words in brackets.

1. The engine room operates as a(n) _____ Machinery Space: the crew is not needed 24-hours a day. Alarm bells are installed which report any machinery fault and then the engineers onboard attend to the problem. **MANNED**
2. When you receive a propulsion telegraph order, you must acknowledge it. You do this through the _____ unit of the telegraph. **EXECUTE**
3. I'm waiting for official _____ from the headquarters before I go ahead with the plan. **CONFIRM**
4. The _____ of the message is successful. **TRANSMIT**
5. They offered me a job. I'm not sure if I _____ it or not. **ACCEPTANCE**



REVIEW 1

Units 1-5

1. Announcement: The vessel

2. Crew ranks

3. Safety Equipment Regulations

4. Terminology Work

1. Announcement: The vessel

Listen to the audio clip. The Master is making an announcement. Tick [✓] a, b, c or d. Then, listen again and complete the chart that follows.

The Master…

☐ a. announces a fire-fighting drill
☐ b. takes new crewmembers on a familiarisation tour
☐ c. gives new crewmembers details about the vessel and its safety equipment
☐ d. dictates the vessel's particulars

VESSEL'S NAME:	
CALL SIGN:	
TYPE OF VESSEL:	
YEAR BUILT:	
PORT OF REGISTRATION:	
NUMBER OF CREWMEMBERS ON BOARD:	

2. Crew ranks

A. Fill in the blanks. The first letter is given:

Onboard a Merchant Ship…

The Master:
acts as r_____ of the ship's owner

The Chief Officer:
is the head of the d_____ department

The Second Officer (N_____ officer):
corrects the charts and keeps everything up to date

The Third Officer (S_____ officer):
is responsible for Life Saving Appliances (LSA), checks the lifeboats, rafts, lifebuoys etc.

The Engine Department:
ensures the smooth o_____ of all propulsion machinery, power generating equipment and auxiliaries

The Catering Department:
is responsible for preparing meals, ordering food s_____ and maintaining living quarters.

B. Write up the words for some of the crew ranks you know.

C _ _ _ f M _ _ e S _ _ _ _ d E _ _ _ _ _ _ r D _ _ k C _ _ _ t
B _ _ _ n M _ _ _ _ _ _ e S _ _ _ _ _ d

3. Safety Equipment Regulations

Safety Equipment Information[1]: Read the following text and choose the correct word for each gap.

1. requests / requirements / obligations / necessities

1. Source: Maritime Safety Queensland, 2008, page 7.

2. inflatable / adaptable / convertible / compatible
3. spring / floating / towing / buoyant
4. Position / Place / Location / Point
5. evacuation / abandon / emergency / urgency
6. spotlight / torch / illumination / lantern
7. incidents / errors / happenings / disasters
8. figure / sum / profile / number

National Standard for Commercial Vessels (NSCV) – PART C 7A

Your new safety equipment (1) _____

REQUIRED SAFETY EQUIPMENT

Class 2C Non-Passenger Vessels – 60 metres or longer

Seagoing Non-Passenger Vessel, 60 metres or longer, for use in all operational areas up to and including Restricted offshore operations. *(Restricted offshore operations: operations within a limit of 50 nautical miles seaward from designated smooth or partially smooth waters, designated restricted offshore waters or a safe haven)*

Liferafts and rescue boats	• (2) _____ Coastal Liferaft(s) for 100% of allowable crew and any other persons on board plus a non-SOLAS Rescue Boat. – Vessels continuously engaged on voyages in operational areas with a monthly mean temperature of 15° C or less must carry an anti-exposure suit for each person assigned to crew the Rescue Boat.
Lifebuoys	• 8 x Lifebuoys: 2 with a light; 2 with a light and smoke signal; 2 with a (3) _____ line; 2 of operator's choice.
Life jackets	• Coastal Life Jacket with a light for 100% of allowable crew and any other persons on board.
Distress signals	• 1 x 406 MHz Electronic (4) _____ Indicating Radio Beacon. • 3 x Parachute distress rockets. • 2 x Red hand-held flares. • 1 x Orange hand-held smoke flares.
On-board communications and alarm systems	• General (5) _____ alarm system.
Emergency lighting (hand-held)	• 1 x Battery operated (6) _____ for each crew member.
Medical supplies	• Annex H: Scale F of Table H.3 – The quantity of medical supplies identified in Annex H is based on (7) _____ involving 1 or 2 persons only. – Medical supplies will need to be expanded in accordance with the particular risks inherent to the voyage and the (8) _____ of persons on board.

4. Terminology Work

A. Match the following phrases to the pictures below. Then choose five of the pictures and describe them. ***Talk about the places you can see/the activities that take place in particular places / the crew members and their responsibilities****.*

– Entrance to / View of the E/R
– Chart work
– Engine Control Room
– Forecastle
– Cleaning in the E/R
– Superstructure fore
– Maintenance on deck: painting
– Crew member checking inspectors' papers before boarding
– Master dealing with port authorities

(a) 

(b) 

(c) 

(d) 

(e) 

f) 

g) 

h) 

i) 

B. Choose the correct alternative.

1. The Mediterranean Sea _____ Europe and Africa.
   a. increases *b.* stacks *c.* separates
2. To work as an Officer you must have a _____ Certificate of Competency (COC).
   a. true *b.* valid *c.* real
3. The engineers ensure the _____ operation of machinery.
   a. useful *b.* defective *c.* smooth
4. STCW is an international _____.
   a. convention *b.* occupation *c.* recreation
5. What is your next port of _____?
   a. visit *b.* berth *c.* call
6. After every drill, we have a drill _____ meeting.
   a. revise *b.* review *c.* supervising

C. Wheel orders: Choose the correct order for each action.

1. Check the swing of the vessel's head in a turn.
   a. Swing her. c. Steady.
   b. Meet her. d. Ease her.

2. Hold rudder in the fore and aft position.
   a. Fore to aft. c. Hold her.
   b. Midships. d. Ease her.
3. Steer steady course on the compass heading.
   a. Steady as she goes. c. Steer her.
   b. Steady. d. Ease her.
4. Reduce the vessel's swing rapidly.
   a. Steady as she goes. c. Swing her.
   b. Steady. d. Ease her.
5. Reduce the amount of rudder and hold.
   a. Hold her. c. Steady as she goes.
   b. Steady. d. Ease her.

D. Word-building. Write the correct derivatives of the words in brackets.

1. Officers must make sure there is _____ access to the lifeboats. (OBSTRUCT)
2. When it was built, everybody thought the Titanic was _____. The disaster was a big shock to the international maritime community. (SINK)
3. According to international _____, ports should have surveillance systems for security reasons. (REQUIRE)
4. _____ gas is an extremely dangerous cargo. (EXPLODE)
5. There are increased _____ measures against piracy in the Gulf of Aden. (PREVENT)
6. In order to increase the number of available holds, multi-purpose ships have _____ 'tweendecks. (REMOVE)

E. Match the words to make correct collocations.

1. evacuation _____ station
2. immersion _____ range
3. eye wash _____ suit
4. wide _____ platform
5. offshore _____ slide
6. harbour _____ reef
7. helm _____ city
8. passage _____ orders
9. capital _____ tug
10. coral _____ planning

F. Write up the missing words in the following sentences. The first and last letters are given.

1. G_____d vessels are equipped with their own cargo cranes.
2. B_____k b_____k cargo is un/loaded piece by piece.

3. To understand the depth on nautical charts you must refer to the chart's sounding d_____m.
4. There are two b_____e systems applied to different areas in the world, IALA A and B.
5. A nautical chart shows you if the s_____d is sandy, rocky, etc.

G. Match the two parts to produce compound words. Write them in the space provided.

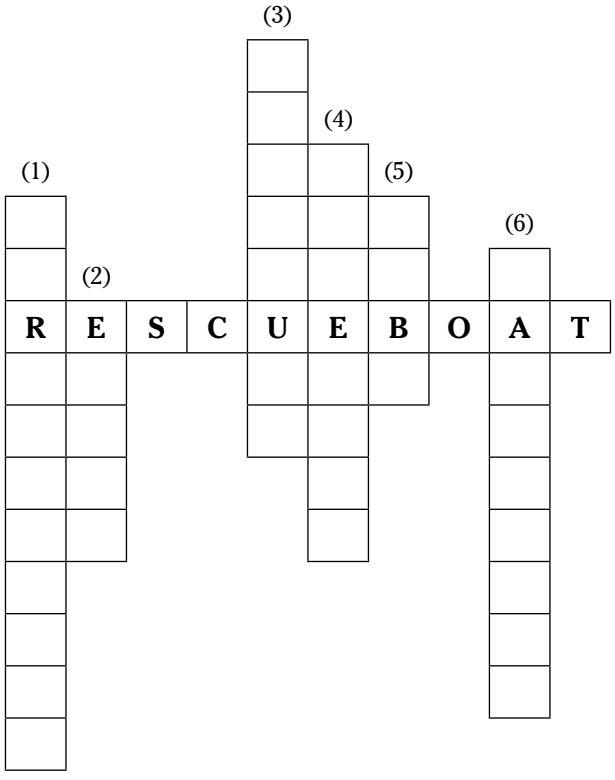
Way-	_____	-line
Fair-	_____	-worthy
Check-	_____	-ware
Pipe-	_____	-point
Life-	_____	-boat
Sea-	_____	-list
Soft-	_____	-way

H. Say what the following abbreviations stand for.

- TSS
- TEU
- ECDIS
- ULCC
- ISPS (Code)
- ISM (Code)
- OPA
- VTS
- SOLAS
- VHF DSC

I. Guess the LSAs in the word grid below.

1. A sheet of material that can extinguish small fires; you find this safety device in the galley.
2. Small buoyant transmitter which automatically sends a distress message via satellites.
3. Life ring; it supports a person in the water.
4. Small inflatable boat, used to abandon ship.
5. A device that protects your breathing when there is not enough oxygen or when there is toxic gas in the atmosphere. (abbreviation)
6. _____ flare: Pyrotechnic device, using smoke to show location in a survival craft.



J. Tick the correct box: True or False?

True	False	
☐	☐	"Handymax" is a classification according to size.
☐	☐	An "ungeared" vessel does not need port facilities.
☐	☐	A refined product tanker carries crude oil.
☐	☐	Break bulk cargo is carried in dry bulk carriers.
☐	☐	An example of liquid bulk cargo is chemicals.
☐	☐	A TEU is a container with dimensions $8 \times 8 \times 60$.
☐	☐	In a Ro-Ro, cars drive through the stern door.

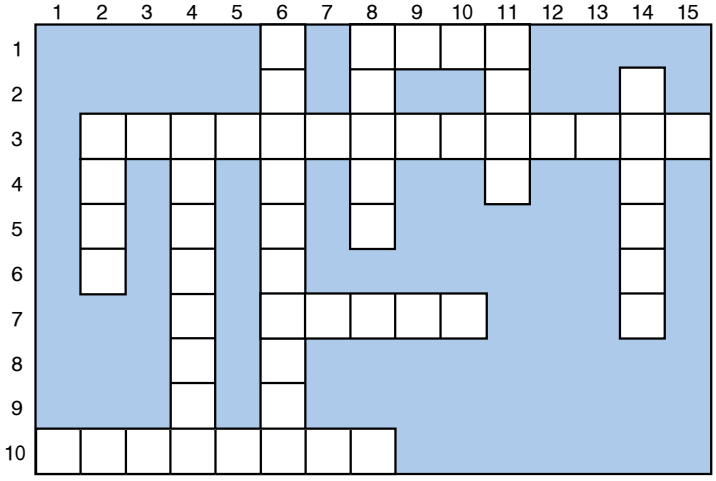
K. Crossword.

Horizontally

1. space inside a ship for car-rying cargo.
3. the raised "house" contai-ning the navigating bridge, etc.
7. after end of a vessel.
10. a wall that separates one part of a ship from another.

Vertically

2. another word for bow.
4. a short raised deck, right aft.
6. raised deck, right forward.
8. opening in the deck of a vessel.
11. I am a cadet _____ officer.
14. all navigational activities take place in it.



UNIT 6

Emergency On Board

1. *Welcome back*
2. *Types of emergency on board*
3. *SMCP: Distress communications*
4. *Emergency and Rescue procedures / situations*
5. *SMCP message markers*
6. *SMCP: Passenger Care*

Round-up

1. Welcome back

A. ***Talk about your first training voyage as a deck cadet / engineer cadet. Note down your answers to the following points and mention them in your discussion.***

1. Voyage duration: _____months.
2. Ports / countries you visited: _____, _____, _____.
3. Maximum / minimum stay per port: _____ days / hours.
4. Type of vessel: _____.
5. Age of vessel: _____.
6. Type of cargo: _____.
7. Place of embarkation / disembarkation: _____ / _____.
8. Pay / overtime: _____ euros.
9. Drills: name some drills you took part in. _____.
10. Any accidents or unusual incidents? _____.
11. You practised your English with / at… _____.

B. ***Check the appropriate box in the following table and then discuss in class.***

How would you characterise the experience?	Positive ☐ Extraordinary ☐	Tiring ☐ Life-changing ☐	Negative ☐ Disheartening ☐
Did you like the food on board?	Very much ☐	So and so ☐	Not really ☐
The communication with your family and friends was…	Excellent ☐	Good ☐	Not enough ☐
Who helped you the most with your training?	Chief Mate ☐ 2nd Engineer ☐	Master ☐ Chief Engineer ☐	Other ☐
What nationalities were the rest of the crew?	Officers:	Ratings:	

Glossary

incident	something (significant) that happens, an event
extraordinary	very unusual, remarkable, unusually great
disheartening	discouraging, that causes you to lose determination or confidence, that makes you less enthusiastic
satisfied	happy, pleased, contented

2. Types of emergency on board

A. ***What types of emergency are the following texts about? Look at the extracts from news articles and then do exercises a – d.***

a) Look at the list of emergencies and say what each text is about.

Grounding	Man Overboard	Fire on board
Sinking	Collision	Oil spill

b) Supply the correct heading and write it in the space provided. There is one extra heading you will not need to use.

– COLLISION, 2,500 mt OIL LEAK
– MISSING PERSONS AT SEA REQUIRE A SEARCH AND RESCUE
– CRUISE SHIP EVACUATION AFTER COLLISION
– A HISTORIC CRUISE SHIP SINKS

c) Match each text to the appropriate picture.

Text A

Heading:

_____

_____

If the person is not quickly found on board the vessel, then the vessel should return to the last location at sea when the person was seen. As an example, if a passenger was last seen at 8 p.m., then the ship needs to back track to the location of the vessel at 8 p.m. to begin a search and rescue operation.

Text B

Heading:

_____

_____

On November 23, 2007, the Explorer, operating in the Antarctic, struck ice. Water started creeping in through a fist-sized hole punched into the ship's starboard. As it flooded the engine room, the power failed. The ship ceased responding. The ship was evacuated. The captain and chief officer stayed to operate the bilge pumps. After hours of listing, the ship went down. The 2,400-ton vessel was carrying 100 tourists in addition to a crew of 50 but no injuries were reported.

Text C

Heading:

_____

_____

(May 25, 2010) An oil tanker and a bulk carrier collided in waters between Malaysia and Singapore, spilling an estimated 2,500 tonnes of oil. The incident happened in the Traffic Separation Scheme (TSS) of the Singapore Strait but traffic in Asia's busiest shipping lane was not affected.

TEXT .....

TEXT .....

TEXT .....

d) Imagine you are a passenger on the Explorer. What can you hear on the public address system after the accident?

B. *MISSING PERSONS. Listen to the safety instructions for the case of a missing person on board. Fill in the missing words.*

1. Determine _____ and _____the person was last seen.
2. Organize a _____ of the vessel including decks, engine room and all accessible _____.
3. Prepare to turn the vessel round and retrace the _____ to where and when there was a last sighting of the person.
4. Post additional _____.
5. Prepare the _____ boat for immediate use and have the _____ standing by.
6. If the _____ search does not find the person, use the VHF to call to other vessels in the area asking them to keep a sharp lookout as they _____ the area.

3. SMCP: Distress communications

A. *Match the pictures to the types of distress.*

Sinking	Grounding	On fire	Oil spill / leak	Capsized

(a)

(b)

(c)

(d)

(e)

B. *Listen to the following SMCP phrases and tick the type of distress communication (in some cases, more than one is relevant).*

TYPE OF DISTRESS	1	2	3	4	5	6	7	8
Collision								
Armed attack / piracy								
Person overboard								
Abandoning vessel								
Fire, explosion								
List – danger of capsizing								
Disabled and adrift								
Flooding								
Sinking								
Grounding								

C. *Fill in the correct preposition. Listen to the distress communication phrases from the previous exercise if you need to.*

1. I am _____ fire.
2. I am flooding _____ the engine room.
3. I have collided _____ iceberg. Crew must abandon vessel _____ collision.
4. I have dangerous list _____ port. I am _____ danger _____ capsizing.
5. I am sinking _____ explosion. I am _____ critical condition.
6. MV Morgan drifting _____ 10 knots _____ South East.
7. I am _____ attack _____ pirates.
8. MV Vectra has lost person overboard _____ position 20 degrees 35 minutes North 060 degrees 30 minutes West.

D. *Choose the correct answer according to the SMCP phrases.*

1. How do you report a fire, according to the SMCP phrases?
   a) Vessel is burning.
   b) Vessel is on fire.
   c) Vessel has caught fire.

2. How do you inform on the type of help needed?
   a) I require medical assistance.
   b) I need medical assistance.
   c) I want medical assistance.

3. How do you ask about the type of help needed (by a vessel)?
   a) What type of help do you need?
   b) What kind of assistance is required?
   c) What kind of assistance have you asked for?

4. How do you report flooding?
   a) MV Destiny has water in the holds.
   b) MV Destiny is flooding in the holds.
   c) There is ingress of water in the holds of MV Destiny.

5. How do you report collision?
   a) I have collided with iceberg.
   b) I have crashed with iceberg.
   c) I have run into an iceberg.

6. How do you report grounding?
   a) I have grounded.
   b) I am aground.
   c) I have stuck on ground.

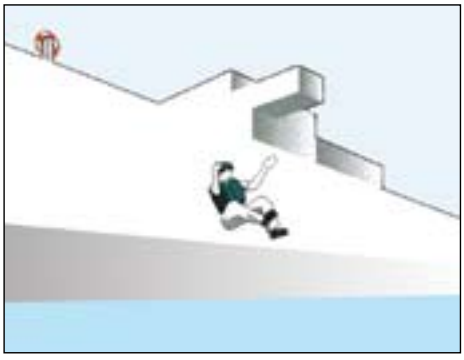
4. Emergency and Rescue procedures / situations

I. Person Overboard

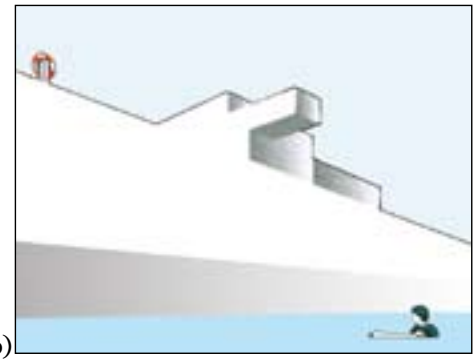
Lead-in:

i. Look at the following pictures. What type of emergency are they showing? What must you do in this type of emergency? Name at least 5 steps you must follow.

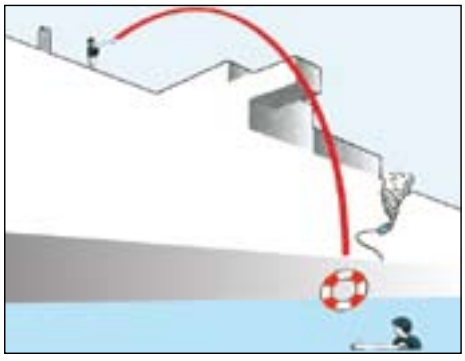
(a)



(b)



(c)



ii. Match the phrases to make full sentences. Put the correct number in each box.

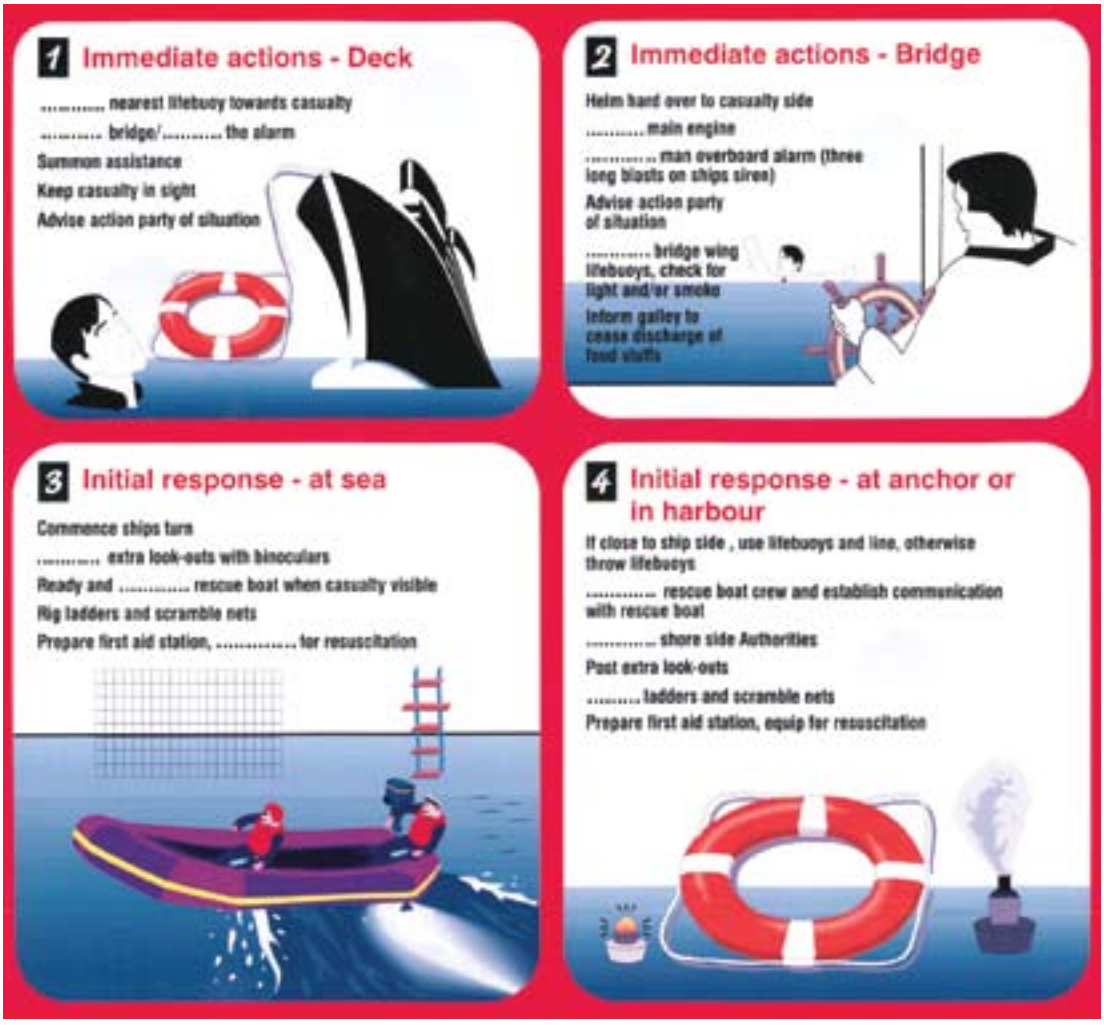
In the event of a Man Overboard the following steps should be implemented:

1. You must shout …	☐ visual contact.
2. You must throw ...	☐ "Man Overboard! Starboard / Port side!"
3. You must maintain ...	☐ the vessel away from the side that the person went overboard.
4. You must raise ...	☐ a Williamson Turn.
5. You must inform ...	☐ the nearest lifebuoy overboard.
6. You must turn ...	☐ additional lookouts.
7. You must do ...	☐ the alarm.
8. You must post ...	☐ the bridge.

a) Look at the pictures of the following safety poster.

What *must* you do when you notice a man overboard and you are...

– on deck? – on the bridge? – at sea? – at anchor or in harbour?



b) Look at the stages of the emergency procedure.

i. There are three missing verbs in each stage; use the ones given below to fill in the gaps.

Man Overboard: Vital action on discovery of a man overboard

1. **Immediate actions – Deck**
   raise / throw / notify
2. **Immediate actions – Bridge**
   release / stop / sound
3. **Initial response – at sea**
   launch / equip / post
4. **Initial response – at anchor or in harbour**
   inform / muster / rig

ii. Use the safety poster to give commands in a man overboard emergency.
e.g. "Call the bridge!"

iii. The casualty is not located. What must you do?
Use the signs below and match the verbs to the nouns in the box to write what you must do.

inform make an entry increase	in the logbook look-outs other ships in the area

1.  You must .....
2.  You must .....
3.  You must .....

Glossary

summon assistance	call for, send for assistance
cease	stop, discontinue
resuscitation	the act of reviving someone from unconsciousness or apparent death (CPR: cardiopulmonary resuscitation)

II. Urgent commands and "must"

Look at the following commands:

Bring your lifejacket! Don't use this fire extinguisher!

- The commands are short.
- We use the verb in the infinitive form.
- We do **not** use *I*, *you*, *he*, *she*…
- We stress the verb in the command: ▮ ▪
  Open the valve!
- In the negative we stress both "don't" and the main verb: ▮ ▮
  Don't panic!

a) Match the halves to make full commands.

1. Close...	…the alarm!
2. Sound...	…garbage overboard!
3. Go to...	…the fire extinguisher!
4. Get...	…that valve!
5. Put on...	…your assembly stations!
6. Don't throw...	…your immersion suit!

b) Use the verbs in the box to complete the sentences.

call	proceed	not enter	stop
get	lower	close	

1. Fire in the galley! _____ the fire blanket!
2. Man overboard! _____ the rescue boat!
3. Emergency! _____ to your muster station immediately!
4. Flooding in the engine room! _____ the Master!
5. The oil is leaking! _____ the pumps!
6. Fire in the accommodation! _____ all fire doors!
7. The air is toxic! _____ that area!

c) Listen to the emergency announcement. Tick the commands you can hear.

1. Get the fire extinguisher!
2. Put out the fire!
3. Do not attempt to extinguish the fire!
4. Post two lookouts!
5. Sound the alarms immediately!
6. Lower the lifeboats!
7. Proceed to your muster stations immediately!
8. Prepare to abandon ship!

Look at the following sign:

You must record all garbage discharges in the garbage record book.

Must means (choose two):

a) it is very important to do something.
b) it is necessary to do something.
c) it is a good idea to do something.

Also, look at the following examples with ***must***:

There is an oil spill on deck! You **must** close the valve immediately!
The oxygen level is low! You **must not** enter the enclosed space!

d) Circle the correct one.

1. You **must / mustn't** throw plastic in the sea.
2. You **must / mustn't** follow emergency procedures.
3. You **must / mustn't** fasten your seat belt when you drive.
4. You **must / mustn't** take notes during class.
5. You **must / mustn't** speak loudly in hospitals.

e) Fill in the blanks with 'must' or 'mustn't'.

1. You _____ smoke in the galley.
2. You _____ make noise in the library.
3. You _____ eat fruit and vegetables.
4. She is ill, so she _____ see the doctor.
5. It is raining. You _____ take your umbrella.
6. This is a secret. You _____ tell anybody.

f) What fire fighting means must / must not be used when dealing with different types of fire? Use the following table and write 5 sentences.

must must not	water foam sand dry powder CO_2 (carbon dioxide) inert gas	accommodation space fires galley fires cargo space fires machinery space fires oil fires electrical fires

e.g. You mustn't use water for electrical fires .....
1. .....
2. .....
3. .....

4. .....
5. .....

III. Hypothermia

a) Read the following information from a Safety Manual. Fill in the missing sentences, which are given below, to complete the stages of the procedure.

Hypothermia[1]
Hypothermia occurs when the body temperature drops below 35°C/95°F. This can occur when the casualty has been immersed in cold water for a length of time or is exposed to cold wind. Here are some guidelines on the treatment of hypothermia: 1. Take the casualty to a protected area. 2. _____ 3. Rewarm the casualty by wrapping them in a sheet, a thermal protection aid or by using the body heat of another person. If the casualty is conscious, they can be rewarmed in a warm bath if they are able to climb into the bath unaided. 4. _____ 5. Look for signs of frostbite. 6. Monitor the casualty for breathing, pulse and temperature._____ _____

If casualty is fully conscious, give them a warm drink.	**Resuscitate if necessary.**	**Remove any wet clothing and replace with dry clothes**

Glossary

occurs	happens, takes place
immerse	dip or submerge in a liquid
frostbite	injury to body tissues caused by exposure to extreme cold, typically affecting the nose, fingers or toes and often resulting in gangrene
wrap	cover, enclose in
unaided	without help, needing no assistance
conscious	aware of and responding to your surroundings
monitor	observe and check something over a period of time

1. Source: SOLAS and Fire Fighting Manual, Methane Jane Elizabeth, Ceres LNG Services Ltd.

b) Use the Safety Manual information above and do the following orally.

i. Give some short commands.
e.g. Remove his clothes!
Wrap him with this blanket!

ii. Say what you must or mustn't do.
e.g. You mustn't keep the wet clothes.

IV. Enclosed space entry

What must you do in case of an enclosed space accident?

a) Look at the signs. Complete the sentences using the phrases given in the box below.

1.  You must .....
.....

2.  You must .....
.....

3.  You must .....
.....

4.  You must .....
.....

carry rescue equipment: breathing apparatus, recovery gear and resuscitators	have good communication with the person responsible for the operation
test the atmosphere for oxygen level, toxic and flammable gas concentrations	wear safety equipment, hard hat, boots, gloves, overalls and personal gas monitor

b) Look at the following Safety Poster and say what you must do after an enclosed space accident. You can use some of the words in the box for help.

use, wear, give, carry, call, help, remove, apply, check	face mask, first aid, resuscitation, stretcher, safety helmet, breathing, breathing apparatus

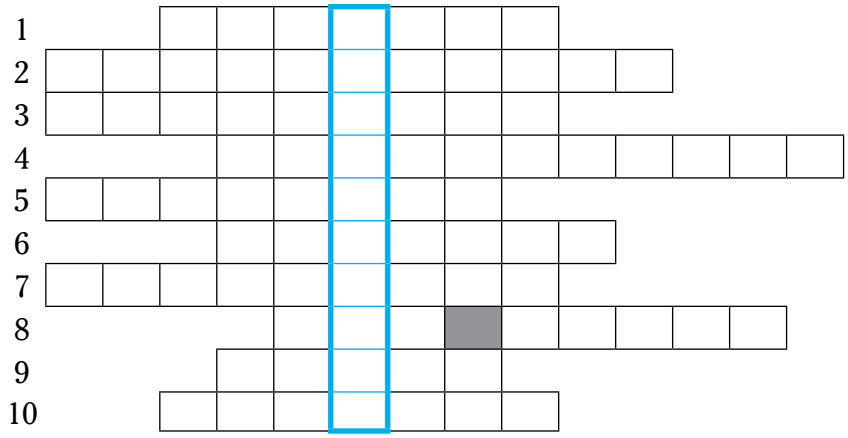
V. Oil pollution

a) Read the following text on oil pollution and then use the words in bold to solve the word puzzle.

*The deliberate, negligent or accidental **dumping** of oil and other harmful substances from ships constitutes a serious source of **pollution** and puts into danger the marine **environment**.*

*In order to **contain** and remove an **oil slick** from the marine environment, there are different techniques, such as the use of **booms**, **skimmers** and **dispersants**, or by pumping or absorbing or **burning**. As prevention is better than cure, it is important to obey the international awnti-pollution regulations, while at the same time being fully prepared to respond adequately to an oil spill **emergency**.*

Oil booms



1. Disposing of oil into the sea.
2. Chemicals that help break up spilled oil.
3. A serious, unexpected, and often dangerous situation requiring immediate action.
4. The natural world.
5. System used for clearing the water of any floating matter (vessels equipped with such systems).
6. Keep within limits, restrain.
7. The contamination of water, soil or the atmosphere by the discharge of harmful substances.
8. A film (layer) of oil floating on the surface of the water.
9. Physical barriers used for the containment of an oil slick.
10. Destroying by fire.

✸ *Which word is formed vertically?* _____ *is better than cure.*

Glossary

deliberate	done consciously and intentionally
negligent	failing to give care or attention
accidental	happening by chance, unintentionally, or unexpectedly

b) Match the adjectives to the nouns.

1. Marine	pollution
2. Harmful	regulations
3. International	environment
4. Accidental	substances

c) Choose the correct alternative.

1. You can **contain / absorb** an oil slick with booms.
2. You can **burn / break up** an oil slick with dispersants.
3. The emptying of oil into the sea is called an **oil spill / oil discharge**.
4. Every vessel must have a **reaction / response** plan in case of oil pollution.

5. SMCP message markers

– In radio communication we may use special marker words to introduce messages and make their purpose clearer. In any message directed to a vessel it should be clear whether the message contains information, advice, a warning, an instruction, etc.

– "Markers" introduce messages and signal the move intended by the speaker, i.e. what the speaker wants to ask, order, request, inform, advice, warn, etc. There are 8 message markers recommended by IMO; here we will see how we use the following four:

INSTRUCTION QUESTION ANSWER INFORMATION

- An "INSTRUCTION" is only given by authorities (a VTS station, naval vessel or authorized personnel).
  e.g. "INSTRUCTION. Do not cross the fairway."
- An "INSTRUCTION" is legally binding: you **must** follow an instruction because it implies the intention of the sender to influence others by a Regulation.
- When you add "QUESTION" before a message, you make it clear that you expect an "ANSWER" as a reply.
  e.g. "QUESTION. What is your present maximum draught?"
  "ANSWER. My present maximum draught is two meters."
- "INFORMATION" is used for navigational and traffic information.
  e.g. "INFORMATION. MV ELINA will overtake to the west of you."
- With message markers you can avoid the use of modal verbs that might cause vagueness.
  e.g.: *May* I enter the fairway?
  → QUESTION. Do I have permission to enter the fairway?
  You *may* enter the fairway.
  → ANSWER. You have permission to enter the fairway.
  Can I use the shallow draught fairway at this time?
  → QUESTION. Do I have permission to use the shallow draught fairway at this time?

A. ***Which of the following messages contain an instruction and which ones a piece of information? Circle the correct message marker.***

1. INSTRUCTION / INFORMATION Stop immediately.
2. INSTRUCTION / INFORMATION Steer course: 1-3-6 degrees true.
3. INSTRUCTION / INFORMATION My position is 20° 52′ S, 034° 37′ W.
4. INSTRUCTION / INFORMATION My cargo is naphtha.
5. INSTRUCTION / INFORMATION Proceed to the nearest safe anchorage.
6. INSTRUCTION / INFORMATION Do not cross the fairway.

B. *What is the appropriate message marker for each of the following messages?*

1. _____ Avoid this area–no possibility for vessels to turn.
2. _____ Recover your fishing gear.
3. _____ What part of your vessel is aground?
4. _____ Aground forward.
5. _____ MV Aldebaran is on opposite course.
6. _____ Alter your course to give way.
7. _____ What is the depth in the outer fairway?
8. _____ Reduce speed to three knots.
9. _____ The wind direction is NE force Beaufort 6.

C. *Listen to the SMCP messages and decide what the appropriate message marker would be for each message. Write the marker in the space provided below. Then listen to the full messages to check your answers and repeat.*

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

D. *The following words are also important in VHF communication.*

correction	say again	repeat	mistake

– Fill in the gaps with these words and then listen to check your answers.

QUESTION	What is your present speed?
ANSWER	My present speed is 14 knots – (1)_____.
	(2)_____, my present speed is 12, one-two, knots.
QUESTION	What is your draught?
ANSWER	My draught is 12.6, one-two decimal 6 metres.
INSTRUCTION	Do not overtake – (3)_____ – do not overtake.
…	(4)_____
INSTRUCTION	Do not overtake.

E. *Write the correct sentence in the gaps to complete the radio exchange.*

• INSTRUCTION. Steer a new course of 90 degrees.	• QUESTION. Do you require navigational assistance to reach the centre of the fairway?	• ANSWER. Yes, I have altered course – my new course is 90 degrees.
• Say again your speed.	• I will alter course.	

VTS OPERATOR

↓

VESSEL

↓

INFORMATION. Your distance is 20.5 nautical miles from the centre of the fairway. (a)……	
	ANSWER. Yes, I require navigational assistance.
QUESTION. What is your present course and speed?	
	ANSWER. My present course is 80 degrees, my speed is 14 knots.
(b)……	
	My present speed is 14 – repeat – 14 knots.
INSTRUCTION. Keep you present speed. (c)……	
	(d)……
QUESTION. Have you altered course?	
	(e)……

6. SMCP: Passenger Care

The Passenger Care section of the SMCP provides phrases that should help the officers and crew of passenger vessels to...

- inform passengers on safety aspects.
- manage passengers in case of an emergency.

More specifically, Passenger Care deals with the following topics:

- Briefing on drills, the general emergency alarm, and the conduct of passengers on board.
- Instructions related to Evacuation and Boat drill.
  e.g. allocating to assembly stations, instructions on how to embark lifeboats, on-scene measures in lifeboats.
- Attending to passengers in an emergency.
  e.g. escorting helpless passengers.

A. *Fill in the missing phrases in the following emergency announcements.*

– to be alarmed	– make another announcement
– for safety reasons	– I repeat
– this is	– further instructions
– under control	– to remain calm

PA announcements on emergency

Attention please!

1. _____ your captain speaking.
2. _____, this is your captain with an important announcement.
3. We have a minor fire in the galley.
4. There is no immediate danger to our passengers and there is no reason _____.
5. _____ we request all passengers to go to their assembly stations.
6. Wait there for _____.
7. The ship's fire-fighting team is fighting the fire. The fire is _____.
8. As soon as I have further information I will _____.
9. I ask you kindly _____. There is no danger at this time.

B. *What should you say to passengers to inform them about how a roll call is performed? Put the sentences in the correct order. Write the correct number (1-4) in each box.*

Performing roll call

☐ When your name is called out, please answer loudly "Here".
☐ At your assembly stations one of the officers will perform a roll call.
☐ If one of your cabinmates is not able to attend the roll call, please inform the officer immediately.
☐ The officer will say "This is a roll call", and will call out the passengers individually by their names.

C. *Fill in the gaps with the words in the box.*

appliances	vicinity	contact
list	abandoned	panic

Informing passengers on present situation

1. The vessel was _____ due to heavy _____.
2. Keep calm. There is no reason to _____.

3. There are enough life-saving _____ for everyone on board.
4. Vessels in the _____ have already been informed of our situation.
5. We have radio _____ with rescue craft.

D. *Choose the correct alternative of the words in bold.*

Protective measures for children

1. Children must be kept under **permanent / stable** observation.
2. Never let children climb on the ship's **rails / bars**.
3. Special lifejackets for children are **accessible / available**; please ask the steward.
4. You may leave your children under **trained / qualified** care in the playroom on B Deck from 09.00 to 17.00 hours.

E. *Put the words in the correct order to make full sentences.*

1. passengers / all / must / drill / this / attend .....
2. aid / who / first / needs / medical ? .....
3. missing / all / search / cabins / persons / for .....
4. the injured / we / for / a stretcher / require .....
5. prohibited / this area / to / strictly / access / is .....

F. *Match the synonyms for the following verbs.*

get	assign	give out, hand out, deliver	be present at
accompany	behave	deal with, take care of	put out

1. attend .....
2. attend to .....
3. obtain .....
4. escort .....
5. extinguish .....
6. allocate .....
7. act .....
8. distribute .....

G. *Match the synonyms.*

1. seasick	☐ very important
2. property	☐ improbable
3. exclusively	☐ belongings
4. approximately	☐ small
5. strictly	☐ nauseous
6. hazard	☐ concerning
7. discipline	☐ forbidden
8. regulations	☐ only
9. preventive	☐ precautionary
10. prohibited	☐ about, roughly
11. manner	☐ rules
12. regarding	☐ self-control
13. vital	☐ way
14. unlikely	☐ danger
15. minor	☐ severely

H. *Match the words to create collocations.*

International ……..	system
Public address ……	~~water~~
Ration of ……	provisions
Drinking ……*water*…….....	regulations
On-scene ……	danger
Long-sleeved ……..	documents
High-heeled ……	route
Personal …….	shoes
Escape …….....	shirts
Imminent ……	measures

I. *Write the noun.*

Verb	Noun
Familiarize	
Demonstrate	
Hesitate	
Evacuate	

Verb	Noun
Assist	
Brief	
Access	
Order	

J. *Fill in the prepositions.*

to	off	via	in
in	within	down	

1. The vessel is _____ all respects ready for sea.
2. All safety equipment is _____ full working order.
3. Do not take _____ your head covering whatever the weather.
4. Rescue vessels are coming _____ our rescue. They will reach us _____ 30 minutes.
5. Sit _____ in the lifeboat immediately.
6. Access to the assembly station is _____ the lounge.

K. *Match the two halves to make full sentences.*

1. Discipline in the lifeboat is…	☐ a MAYDAY.
2. Do not drink seawater...	☐ of vital importance.
3. We will send…	☐ when entering the lifeboat.
4. Keep a sharp look-out...	☐ given by the crew.
5. We will fire rockets...	☐ to collect your property.
6. Follow closely the demonstration...	☐ whatever the situation.
7. Do not return to your cabin...	☐ for persons in the water.
8. Do not push each other...	☐ to attract attention.

Round-up

A. Vocabulary Consolidation Self-Assessment.

Tick ☑ what you can do. Cross ☒ what you still find hard to do in English.

- ☐ Talk about different types of emergency situations on board
- ☐ Understand instructions for emergency procedures
- ☐ Give urgent commands
- ☐ Use "must" for obligation and "must not" for prohibition
- ☐ Use SMCP message markers
- ☐ Use SMCP for external distress communications
- ☐ Use SMCP for passenger care

B. Class Project.

- Find out more about the collision accident mentioned in the article on page 133 and present to class the names, flags and cargo capacity of the two vessels, types of cargoes, damage, oil-spill response, etc.
- Collect information about the ship's Garbage Management Plan and the Garbage Record Book and present to class.
- Find out more about MARPOL Annex I on the Regulations for the Prevention of Pollution by Oil and present to class.

C. Situation or Condition?

1. The vessel is in a good _____, even though it is old.
2. In any emergency _____ you must follow orders immediately.
3. MV Pride is in critical _____ after grounding.
4. The _____ is very complicated. We need to find a solution soon.
5. "Person picked up is crew member of MV Saturn." "What is _____ of person?"

D. Look at the following radio exchange between the VTS operator and a vessel and do exercises a and b.

a) Fill in the gaps. The first letter is given.
b) Put the correct message marker at the beginning of each message. Use QUESTION / ANSWER / INSTRUCTION / INFORMATION.

1. _____ Your distance is 20.5 n…… m…….. from the centre of the fairway.
2. _____ Do you r……. navigational assistance to reach the centre of the fairway?
3. _____ Yes, I require navigational assistance.
4. _____ What is your present course and speed?
5. _____ My present course is 80 d……., my speed is 14 k……..
6. _____ Steer a new c…… of 90 degrees.

E. Fill in the correct verb.

throw	post	do	maintain	raise	inform

In the event of a Man Overboard...

1. you must _____ the nearest lifebuoy overboard.
2. you must _____ visual contact.
3. you must _____ the alarm.
4. you must _____ the bridge.
5. you must _____ a Williamson Turn.
6. you must _____ additional lookouts.

F. Word-building. Fill in the correct derivative of the words in brackets.

1. You must carry a breathing apparatus when entering a(n) _____ (close) space.
2. You must wear full _____ (protect) clothing when dealing with fire.
3. In a person overboard situation, if the victim is _____ (vision), you must launch the rescue boat immediately.
4. I do not require medical _____(assist).

G. Match the adjectives to the nouns.

spaces	lookouts	use	sighting	gas

1. immediate .....
2. additional .....
3. accessible .....
4. last .....
5. flammable .....

H. Choose the correct word.

1. The restoration of life functions after apparent death is called *resuscitation / response*.
2. “What is the nature of *trouble / distress*?” “I have problems with navigation.”
3. All vessels, search in *vicinity / district* of position 20° 35′ North, 060° 30′ West.
4. Number of *casualties / fatalities* due to explosion: two.
5. *Fix / Rig* the pilot ladder immediately.
6. *Apply / Put* a face mask to the victim. He can’t breathe properly.

UNIT 7

Cargo Handling, Quantities And Supplies

1. *Different types of containers*
2. *Cargo handling (SMCP B3)*
3. *Loading capacities and quantities*
4. *Cargo handling gear of different types of cargo ship*
5. *Inventory / Ordering supplies*

Round-up

1. Different types of containers

Lead-in: ***Look at the following list of containers.***

- chest / box / case
- pallet / crate / carton
- barrel / drum / cask
- sack / bag / bale

1. How many of these words do you know?
2. Can you identify any of these containers in the pictures below?
3. Which ones are cylindrical, square or rectangular?
4. Which ones are made of wood?
5. What other material are they made of?
6. Which ones can you carry liquids in?

A. *Write a caption under each picture. Here are some useful words.*

equipment shipping cases	steel barrels	cotton bales
drum	sea chest	crate
configuration of pallets	sacks	drums / barrels on ship
casks	pallet	

(a).....

(b).....

(c).....

(d).....

(e).....

(f).....

(g).....

(h).....

(i).....

(j).....

(k).....

B. *Match the type of cargo with the appropriate container.*

chest	sack	carton	bale	box	barrel

Coffee – .....
Tea – .....
Vegetable oil – .....
Electrical goods – .....
Cotton – .....
Juice – .....

Cardboard box

Sea chest

Closed crate

Plastic crate

Milk carton

Tea chest

Glossary

crate	a slatted wooden case used for transporting goods, e.g. a crate of bananas. Also, a square rigid container divided into small units, used for transporting bottles, e.g. milk crate
carton	a small light box or container in which drinks or foodstuffs are packaged. Also (esp. North American), a large container of goods
chest	a box for the shipping of certain goods, such as tea. Also, a sturdy box with a lid and a lock, used especially for storage (e.g. sea chest, captain's chest)

D. *Match the cargoes to the containers (two words for each container).*

cotton	fish oil	petroleum	fish	~~rubber~~	tomatoes
wool	toys	guns	sugar	musical instruments	flour
wine	rum	~~milk~~	coal tar	orange juice	books

Cask: .....
Bale: .....
Crate: .....
Case: .....
Carton: .....milk, ...

Box: .....
Sack / Bag: .....
Drum: .....rubber, ...
Barrel: .....

2. Cargo handling (SMCP B3)

• ***Cargo handling gear: the facilities required for un/loading the cargo***

A. *What cargo handling gear is shown in the pictures below?*

grain elevator and barge	ore loader with conveyor belt system loading minerals	tanker deck piping
crane with grab discharging coal		oil tanker cargo manifolds
forklift truck	gantry cranes in container terminal	bobcat
stowage plan		oil cargo pump

(a).....

(b).....

(c).....

(d).....

(e).....

(f).....

(g).....

(h).....

(i).....

(j).....

B. *The following are verbs you need to give orders for handling cargo. Match them to their definition.*

overstow	exceed	relash	rig	secure

1. _____: go above / over (e.g. the speed limit)
2. _____: put on top (e.g. stack on top of something else)
3. _____: tie up again (using belts, strings, etc.)
4. _____: make safe by fastening down
5. _____: put together, fix and fit

C. *Match the beginning and ending phrases to make full sentences.*

1. Do not exceed	... hooks for handling bags
2. Do not use	... the hold ventilation yet.
3. Do not overstow	... the loading rate of 2,000 tonnes per hour.
4. Do not switch off	... cartons with other goods.

D. ***Match the verbs on the left to the phrases on the right to form full orders related to loading and cargo handling.***

1. Check _____ the pallets closely together.
2. Secure _____ damaged boxes.
3. Relash _____ the winchmen.
4. Stow _____ the correct fixing of the rope clips.
5. Place _____ dunnage between the tiers.
6. Close _____ the heavy lifts.
7. Refuse _____ the hatches in case of rain.
8. Instruct _____ all lashings.

E. ***Fill in the correct preposition.***

1. Check the containers _____ damage.
2. Keep _____ the safe working load of crane.
3. Clean the tween deck _____ opening lower hold.

3. Loading capacities and quantities

A. ***Answer the following questions in full, following the SMCP.***

1. Is the cargo list available and complete?
   Yes, ...
2. Are the holds free of smell?
   Yes, ...
3. Are the safety arrangements in the holds operational?
   No, ...
4. Are the hold ventilators operational?
   No, ...
5. Are dockside cranes available?
   Yes, ...

B. ***Write the questions for the following answers. Fill in the correct measurements/quantities in the sentences where they are missing, using the table below.***

10 metres	2 tonnes	2,000 tonnes per hour
30 containers per hour	2,000 cubic metres per hour	20 by 20 metres

1. _____?
   26,000 cubic metres of cargo space are required.
2. _____?
   The handling capacity of the container crane is .....
3. _____?
   The SWL of the slings is .....
4. _____?
   The handling capacity of the ore loader is .....
5. _____?
   The size of the hatch openings is .....

6. _____?
   The SWL of the main deck is 15 tonnes per square metre.
7. _____?
   The maximum reach of the crane is .....
8. _____?
   The maximum discharging rate is .....

C. *Fill in the information / words needed on loading capacities and quantities.*

a) Complete the missing figures in the answers given according to the particulars of MV Nirint Commander.

b) Write a question for each answer. Then, practise saying the exchanges with your fellow students correctly. Watch the way you link vowels and consonant sounds as you speak.

1. _____ ?
   The deadweight is _____ tonnes.
2. _____ ?
   The hold capacity is _____ cubic feet for grain, and the bale capacity is _____ cft.
3. _____?
   The container capacity is _____ TEU.
4. _____?
   The refrigerated container capacity is _____ TEU.
5. _____?
   The loading capacity of the cranes is _____ metric tonnes combined.
6. _____?
   There are _____ holds available.

NIRINT SHIPPING

Head Office
Boezembocht 23
P.O. Box 3291
3003 AG Rotterdam

Tel +31-10-2662530
Fax +31-10-2662536
operations@nirint.com

Ships Particulars

Name	**MV "Nirint Commander"**
Flag	Antigua & Barbuda
Port of Registry	St John's
Build	1996 April
Callsign	V2VD
Class	Germanischer Lloyd GL + 100 A5 E GL + MC E AUT
Imo Number	9051595
LOA	100.70 mtr
Breadth mld	17.80 mtr
Draft	6.65 mtr on summer sw
Deadweight	6.149 tdw
Gross tonnage	4489 GRT
Net tonnage	2244 GRT
Panama fitted	YES
Suez fitted	YES

Type	Dry Cargo Multipurpose Container Vessel
Grain/Bale Capacity	268286 / 258150 cft
Container Capacity	377 TEU
Reefer plugs	30
No of Holds	2 box-shaped double skinned cargo holds
Tweendeck	Half flush removable tweendeck in Hold 2
Hatchcovers	MacGregor non-sequential pontoon hatch covers,
Ventilation	6 air changes per hour based on empty holds
Hold equipment	Co_2 fitted in all 2 cargo holds Steel floored tanktop with flush container shoes
Cargo handling gear	2 x 35 mt cranes Max. loading capacity 67 mt combined
Speed	abt 13.5 kn

D. ***Look at the ship's particulars for M/T Angelica Schulte and answer the following questions.***

1. What is the pumping capacity of the cargo pumps?
2. What is the pulling capacity of the mooring winch forward?
3. What is cargo tank No 2 (Port Side) capacity?

Ship's Particulars for *M/T "Angelica Schulte"*

Call sign.	: **A 8 G V 4**	MMSI	: **636 090 864**	**Hull dimensions:**	
Homeport.	: **Monrovia**	Inmarsat-F (voice1)	: **764 341 666**	Length LOA. Extr.	: **243,00 m**
Nationality.	: **Liberia**	Inmarsat-F (voice2)	: **764 341 667**	Length LPP.	: **233,00 m**
IMO/Lloyds No.	: **9296822**	Inmarsat-F (fax)	: **764 341 668**	Breadth moulded.	: **42,00 m**
Radio Accounting.	: **CY 03**	Inmarsat-F (data64)	: **600 628 253**	Depth moulded.	: **20,70 m**
		Inmarsat-F (MPDS)	: **600 628 254**	Summer draught.	: **14,75 m**
Date of keel laid	: 06-12-2004	Inmarsat-C	: **463 790 320**	Corresponding deadweight.	: **106,443 mt**
Date of delivery	: 21-04-2005			Max air draft above BL.	: **49,258 m**

Load Line. (Freeboard from deck line)

Tropical	:	5688 mm (T)
Summer	:	5995 mm (S)
Winter	:	6302 mm (V)
Winter North Atlantic	:	not required
Load line:		
Fresh water allowance	:	334 mm above (S)
The upper edge of the deck line from which these freeboards are measured is:		NIL m

Builder	:	Universal Shipbuilding Corp.,Ariake Shipyard.
Building No.	:	010
Owner	:	***MS"Angelica Schulte" Schifffahrtgesellschaft mbH & Co. KG; Hamburg, Germany***
Operator	:	***Vorsetzen BSK***
		Vorsetzen 53
		Hamburg 20459
		Germany
		Tlf. : + 49 - 40 82 22 650
		Telex : + 41- 21 26 7

Mooring Winch

	Wire #	Brakes	Pull	Length	Dia.
Fwd.	4+4	61 t	16 t	250 m	33.5 mm
Aft.	6+2	61 t	16 t	250 m	33.5 mm

Tonnage	Gross	Net
International	56,163	32,720
Suez	57.624,26	53,519.48
Light ship weight	16.403 mt	
L.S. Freeboard	18.497	

Pumping Capacities

	Number	Each
Cargo pumps	3	2500 m^3/h
Stipping pump	1	150 m^3/h
Ballast pump	2	1500 m^3/h

RPM and SPEED

Engine order	RPM	Speed in loaded condition	Speed in ballast condition
Full navigation	97.6	15.7 knots	16.7 knots
Full ahead	68	11,0 knots	12,3 knots
Half ahead	58	9,4 knots	10,8 knots
Slow ahead	41	6,6 knots	8,0 knots
Dead slow ahead	32	5,2 knots	6,5 knots

Time and Distance to stop

	Normal loaded cond.		Normal ballast cond.	
	Time	Dist.	Time	Dist.
Full navigation	15'02'	1,88 nm	8'08'	1,1 nm

Main Engine: One "SULZER" 7RTA58T two-stroke, turbo-charged marine diesel engine / Max Cont. Rating: 14,000 kW at 103 rpm / Cont. Service Rating: 11,900 kW at 97.6 rpm / Max. F.O. daily consumption: 48.3 Mt / Max bunker intake: 2,972 m^3 Fuel Oil -330 m^3 Diesel Oil / Propeller submerged at: 7,54 m

Cargo Tank Capacities in M^3

	Port		Starboard	
	100 %	98 %	100 %	98 %
1	7,904	7,746	7,904	7,746
2	10,037	9,836	10,037	9,836
3	10,081	9,879	10,081	9,879
4	10,081	9,879	10,081	9,879
5	10,081	9,879	10,081	9,879
6	9,710	9,516	9,710	9,516
Slop	2,177	2,133	2,177	2,133
Total at 100 %: 120,142 m^3		**Total at 98 %: 117,736 m^3**		

Aux. Engines: YANMAR
6N21AL-DV
680 kW at 900 rpm.

BCM distance.	:	123,45 m
Bridge to CM.	:	80,83 m
Bridge to bow.	:	204.30 m
Bridge to stern.	:	38,70 m

E. *In pairs, exchange information according to the instructions below.*

Student A: Ask about the following capacities and fill them in.
e.g. ***What is*** *the deadweight of the vessel?*

dead-weight	maximum discharging rate	hold capacity	container capacity	maximum reach of the cranes	container crane handling capacity
main deck SWL	size of hatch openings	cargo pump capacity	SWL of fork-lift trucks	SWL of slings	SWL of cranes

Student B: Answer the questions using the particulars given on page 493.
e.g. The deadweight (of the vessel) is...

- m^3/h (Cbm/h) = c _ _ _ c metres per h _ _ r
- t /m^2 (t/Sqm) = tonnes per s _ _ _ _ e metre

4. Cargo handling gear of different types of cargo ship

A. *Vocabulary assessment.*

Use the vocabulary development scale to rate the following words:

5 can explain and use in different contexts
4 use in a limited way in speaking/writing
3 understand the "gist" of it
2 recognize but don't understand
1 unknown to me

__ Stowage plan
__ Loading rate
__ Cargo list
__ Cargo shifting
__ Stability
__ Hold capacity
__ Storage
__ Cargo segregation
__ Rigging
__ Coamings
__ Notice of readiness to load
__ Commodities
__ Minimize
__ Locking Devices

B. *Find the words that describe how cargo is handled.*

- In a tanker cargo is p _ _ _ _ d through pipes.
- In a bulk carrier we use g _ _ _ s, tubes or e _ _ _ _ _ _ _ s.
- In container ships, containers are handled by special g _ _ _ _ y c _ _ _ _ s.

C. ***Write key words regarding cargo handling on each type of ship. Use the words in the box below.***

cargo pumps	elevator	~~deck cranes~~	lightering	pouring cargo in holds	tier/row/ bay
~~derricks~~	cells	manifolds	lashing	ship-to-shore connection	loader
conveyor belt	~~winches~~	~~cargo hoses~~	stacking	~~gantry crane~~	grab
~~slings~~	piping	locking devices	~~trimming~~	marine loading arms	

derricks, winches, deck cranes, slings

cargo hoses, ..., ..., ..., ..., ...

trimming, ..., ..., ..., ...

gantry crane, ..., ..., ..., ...

D. ***Underline the sentences on cargo handling and note the keywords to check your answers to the previous exercise.***

Cargo ships and their cargo handling gear

1. The general cargo ship uses various combinations of derricks, winches and deck cranes for the handling of cargo. Depending on the cargo, different types of slings can be used. Access to the holds is provided by hatch openings. Hatch covers of steel close the hatch openings when the ship is at sea. The hatch covers are made watertight and lie upon coamings around the hatch which are set some distance from the upper deck to reduce the risk of flooding in heavy seas. One or more separate decks are fitted in the cargo holds and are known as tween decks. Greater flexibility in loading and unloading, together with cargo segregation and improved stability, are possible using the tween deck spaces.
2. In tankers, cargo pumps are used for loading and discharging. Large amounts of piping are to be seen on the deck running from the pump rooms to the discharge manifolds positioned at midships, port and starboard. Loading an oil tanker consists primarily of pumping cargo into the ship's tanks. In discharging, the ship's cargo pumps are used to move the product ashore. Cargo can be moved on or off an oil tanker in several ways. One method is by ship-to-ship transfer, also known as lightering. In this method, two ships come alongside in open sea and oil is transferred manifold to manifold via flexi-ble hoses. Lightering is sometimes used where a loaded tanker is too large to enter a specific port. Another method is for the ship to moor alongside a pier, connect with cargo hoses or marine loading arms. A third method (SBM, Single Buoy Mooring) involves mooring to offshore buoys and making a cargo connection via underwater cargo hoses.
3. Bulk/ore carriers transport single-commodity cargoes such as grain, sugar, coal and ores in bulk. Large hatchways are a feature of all bulk carriers, since they reduce cargo-handling time, facilitate rapid simple cargo handling and so improve loading rate. Cargo handling is done with loaders, conveyor belts, elevators and bulk-handling cranes which carry a grab or bucket. Cargo should be distributed evenly within each hold and trimmed to the boundaries of the cargo space to minimize the risk of it shifting at sea. So, after the cargo is poured in the holds, bobcats are used to keep the cargo levelled in order to maintain stability. A large proportion of bulk carriers do not carry cargo-handling equipment, because they trade between special terminals which have particular equipment for loading and unloading bulk commodities.
4. In container ships, the cargo-carrying section of the ship is divided into several holds which have hatch openings the full width and length of the hold. Cellular container ships are ships fitted throughout with fixed or portable cell guides for the carriage of contai-ners. Depending on the type of the ship, containers are secured by cell guides, or are secured on deck by lashing gear (e.g. rods and twistlocks). Cargo handling consists only of vertical movement of the cargo in the hold and the containers are connected together at their corners by locking devices and stacked according to the tier / row / bay numbering system. The container crane is a special version of gantry crane operating in container terminals. These gigantic cranes lift the containers and place them one on top of the other in their respective cells. Once the hull is loaded additional containers are stacked on the deck.

E. *Write a caption for each picture.*

Container securing (rods, twistlocks)	STS (Ship to Ship Operation)	SBM (Single Buoy Mooring or Single Point Mooring)
Pouring durum wheat into the holds	Container numbering system	

(a).....

(b).....

(c).....

(d).....

(e).....

F. *Match the synonyms.*

1. feature	___ fast, quick
2. facilitate	___ product
3. rapid	___ amount, ratio
4. proportion	___ characteristic
5. commodity	___ make easy

G. *Fill in the table.*

Adjective	Noun	Verb
high		heighten
	width	
	length	
broad		
	depth	deepen

H. *Match the following to form correct collocations.*

gear	plan	rate	calculation

Loading _____ Stability _____
Stowage _____ Handling _____

I. *In the text of exercise D you read that the loading rate is improved due to large hatchways. Study the following paragraphs to familiarize yourself with more key words on loading procedures. Write up the missing words.*

- When acting as a cargo officer, the chief mate oversees the loading, stowage, securing and unloading of cargoes. Moreover the C/M is accountable for the care of cargo during the voyage. This includes a general responsibility for the stability conditions of the ship and special care for the cargoes that are dangerous, hazardous or harmful. That is why s/he makes the s _ _ _ _ _ _ _ y c _ _ _ _ _ _ _ _ _ n.
- The s _ _ _ _ _ e p _ _ n is a completed stowage diagram showing what material has been loaded and its stowage location in each hold, between-deck compartment, or other space in a ship, including deck space. Each port of discharge is indicated by colours, numbers or other appropriate means.

J. *SMCP: Preparing for loading and unloading / briefing on stowing and securing.*

Fill in the words:

tiers	available	reach	stowage
capacity	free	bent	arrangements
readiness	list	stability	rate

1. The cargo _____ will be available and complete in 10 minutes.
2. The _____ plan is completed.
3. Make the _____ calculation.
4. Give notice of _____ to discharge by 21 00 hours UTC.
5. What is the maximum loading _____?

6. Place dunnage between the _____ .
7. Are floating cranes _____?
8. What is the maximum _____ of the crane?
9. What is the handling _____ of the grain elevator?
10. Are the holds _____ of smell?
11. Are the safety _____ in the holds operational?
12. The hold ladder is _____. Straighten the hold ladder.

5. Inventory / Ordering supplies

Listen to the dialogue between the cook and the steward about an inventory of the food supplies on board.

A. ***Fill in the list. Listen to the dialogue twice. First fill in the food items missing. During the second listening, fill in the quantities and numbers.***

INVENTORY

Food items mentioned	We have (quantities)	We need
Apples	(2 cartons x 5 kilos) 10 kilos	(1 carton) 5 kilos
_____	(5 packages x 1 kilo) 5 kilos	_____
Tomato sauce	_____	X
_____	(10 packages x 10) 100	X
Milk	50 pints	X
_____	Not enough	_____
Sliced white bread	5 packages	_____ packages
_____	Not enough	50
Juice	_____	X
Chicken	10 kilos	X
_____	4 kilos	_____ kilos
Pork chops	Not enough	15 kilos
_____	Not enough	_____
Beer	Not enough	_____
_____	Not enough	_____
Salt and spices	Enough	X
_____	Enough	X

In the dialogue we hear the following phrases:

– we have got enough
– there is too much tomato sauce
– there are too many eggs
– there is not enough butter
– there isn't enough beef fillet
– we have enough salt and spices

B. *Complete the sentences. Use 'too much', 'too many', 'enough', or 'not enough'.*

1. Risk of overflow. There's _____ fuel in the tank. (too much / too many)
2. Visibility is poor. There's _____ fog. (too much / too many)
3. We need to buy more paper. There's _____ paper for the printer. (enough / not enough)
4. Do we have _____ provisions for the trip? (enough / not enough)
5. There are _____ sick crewmembers on board. (too much / too many)

C. *Look at the supplier's web page and then answer the questions below.*

CAMPBELL'S SHIPS SUPPLIES

Atlantic Canada's largest full service ships supplier

Ship Supplies

Food Service

Inventory

Campbell's Foodservice has access to over 2 million pounds of national and brand name fresh and frozen food products on-site, providing "one-stop shopping" convenience for our customers.

Our inventory includes:

✸Beef ✸Desserts ✸Poultry ✸Fish ✸Pork ✸Bread ✸Vegetables ✸Fruit

Bonded stores:

✸Duty-free Canadian and US tobacco products ✸Duty-free spirits, wines, and beer

Delivery

Our local delivery personnel ensure customer foodservice orders are delivered in our modern fleet of temperature controlled refrigerated vehicles on time, every time.

Employees

Our employees always provide our customers with quality products, exceptional service and "common sense" advice because we listen, we understand, and we respond in a timely and professional manner to our customers' every need. We employ staff fluent in Portuguese, Spanish, Russian and Japanese to ensure all customers' requests are fully understood and filled.

Our ships' chandlers are dedicated to servicing all types of ocean-going vessels located at any port in Newfoundland. We deliver all good s and services on time, every time to meet our customers' port turnaround deadlines.

– Who is a "ship chandler"?
– What does the inventory include?
– What are "bonded stores"?
– How are the supplies delivered?

D. *In pairs produce a dialogue between the ship chandler and the person on board who is ordering supplies.*

Student A: You are on board MV Happiness. The cook has given you the list of food supplies you need to order. You have the exact quantities. Ask for the prices (you can try to negotiate prices if you want).

Item	Quantity	Price	Total
Apples	5 kg		
Tomatoes	4 kg		
Butter	5 kg		
White bread	15 packages		
Rolls	50		
Beef fillet	10 kg		
Pork Chops	15 kg		
Sausages	20 kg		
Beer	20 cans		
Olive oil	5 litres		

Student B: Go to page 493. Give the prices. Start like this: A: I'd like to place an order.
B: Sure, what do you need?
...

E. *Order the supplies by fax. Fill in the information required. Rearrange the word order to write up your text.*

M/V **.....**

FAX

TO:	.....	FROM:	MASTER M/V .....
ATTN:	Mr. Hatz....	PHONE:	352389533 (INMARSAT B)
CC:	NONE	FAX No:	352389534
		TELEX:	352389535 PPP X (INMARSAT C)
FAX No:	+30 210 7725898	PAGES:	2 (including this one)
PHONE:	+30 210 7725897	DATE:	July 25, 2015
SUBJECT:	.....	Y/REF:	

☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

TEXT / REMARKS

my / made / to / this is / confirm / order / by phone.

.....

detailed / with / I / order / am / attaching / a 2nd page / the.

.....

agreed / the / total / is / amount / (in USD):

.....

Round-up

A. Vocabulary Consolidation Self-Assessment.

In this chapter you practised vocabulary on the following topics; tick ☑ the topics you feel confident you can express yourself in English on, and give four key words connected to each topic.

☐ types of container
☐ cargo handling gear
☐ cargo handling by different types of ships
☐ loading capacities and quantities
☐ numbers and measurements in an inventory of food supplies

B. Class Project.

Find information on, and present in class one of the following:

- Future techniques in cargo handling; the development of integrated or multimodal systems.
- More information on one type of cargo handling gear, e.g. cranes (development, different types and models, etc).

C. Supply the term for the following definitions.

- a complete list of items such as goods in stock: i_____
- a dealer in supplies and equipment for ships: s_____ c_____
- the process of transferring cargo between vessels of different sizes: l_____

D. Word Grid.

Look for 7 types of container and 7 items of cargo handling gear in the following word grid. Look for them horizontally and vertically.

A	L	L	O	C	K	A	M	C	N	O	C	P	Q
B	O	B	C	A	T	E	B	A	G	N	R	I	S
C	N	A	T	R	Y	D	Z	R	Y	X	A	T	U
B	W	P	W	A	C	R	A	T	E	M	N	V	W
E	Y	C	A	S	H	U	J	O	N	Y	E	L	D
D	F	U	L	C	L	M	I	N	E	G	Z	I	E
T	P	L	K	A	E	W	S	G	R	R	E	N	R
O	S	T	T	S	H	E	L	E	V	A	T	O	R
P	A	L	L	E	T	X	I	T	O	B	T	E	I
R	C	A	I	N	E	Y	N	Y	N	A	S	T	C
E	K	Y	H	I	C	K	G	E	L	N	U	V	K
P	B	F	P	U	M	P	S	D	C	E	B	F	A

E. Choose the correct alternative.

1. The Safety Officer is **dependable / in charge / accountable** for any expired fire extinguisher that has not been replaced.
2. Tourism is a valuable **commodity / possession / item** for Greece.
3. When stowing dangerous cargo in a container ship, you must follow the **isolation / separation / segregation** requirements of the IMDG (International Maritime Dangerous Goods) Code.
4. This bag is **rotten / torn / cracked**. It cannot be accepted. It needs to be **resewn / restitched / reassembled**.
5. Do not **exceed / overcome / rise** the speed limit of 50 miles per hour or you'll pay a fine.

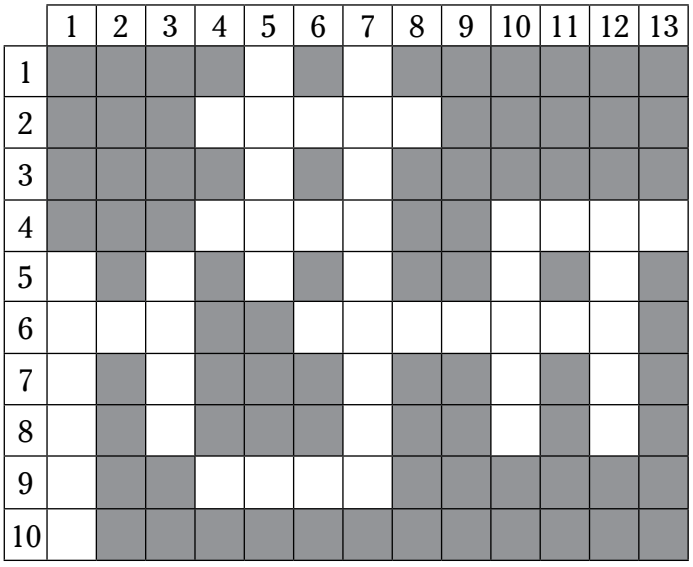
F. Crossword puzzle.

Across:

2. Gantry _____
4/a. Cotton _____
4/b. If you feel sea-_____, take some medicine.
6/a. Iron-_____
6/b. _____ plan
9. Single _____ Mooring

Down:

1. _____ stores
3. Cargo handling _____
5. Sliced white _____.
7. Every month we have a(n) _____ of our supplies.
10. Rubber _____
12. Sea / treasure _____



UNIT 8

Vessel Particulars And Specifications

1. *Comparing vessels*
2. *Function and operation of equipment on board*
3. *SMCP: Pilot on the bridge*

Round-up

1. Comparing vessels

I. Vessel particulars and technical specifications

a) Listen to a presentation of the following three vessels and note down some of their particulars.

VESSEL DATA	BRITISH EMERALD	ATLANTIC PIONEER	OBERON
Type of vessel			
Flag			
Completion Year			
Length Overall			
Breadth			
Deadweight			

Glossary

specifications — the detailed description of requirements set by a classification society for a vessel under construction, in general, a detailed description of the design and materials used to make something

particulars — detailed information about someone or something

b) Listen again. Which of the following phrases can you hear in relation to each vessel? Write them in the correct column.

- the world's largest
- one of the largest
- ~~one of the newest~~
- the highest class
- more reliable
- more effective
- more expensive
- stronger
- the highest specifications

BRITISH EMERALD	ATLANTIC PIONEER	OBERON
.....	one of the newest	.....
.....	.....	.....
.....	.....	.....

c) Fill in the following data for the vessel you served on as an apprentice in your training voyage. Then write sentences comparing M/V Buffalo to your vessel.

Note: *For information on using comparative and supelative adjectives go to page 525).*

VESSEL DATA	M/V BUFFALO	YOUR VESSEL
Type of vessel	Container ship	
Flag	Danish	
Completion Year	2007	
Length Overall	294	
Breadth	32	
Deadweight	52,400	

Which of the two vessels is **older/longer/wider**? Whose cargo on board is **heavier**?

*e.g. My vessel is **older than** the M/V Buffalo.*

1. ……
2. ……
3. ……
4. ……

d) Ask your partner about the particulars of his / her vessel and fill them in the following chart.

VESSEL DATA	YOUR PARTNER'S VESSEL
Type of vessel	
Flag	
Completion Year	
Length Overall	
Breadth	
Deadweight	

e) Compare M/V Buffalo, your vessel and your study partner's vessel. Which of the three vessels is the oldest/longest/widest? Whose cargo on board is the heaviest?

e.g. My vessel is the oldest one.

1. ……
2. ……
3. ……
4. ……

II. What are the world's largest ships?

a) The largest cruise ship in the world.[1]

Read the text and choose the correct word in bold to create the right caption for each picture.

MS Allure of the Seas is the world's largest passenger vessel. It's only 5 cm (two inches) longer than her sister ship, the MS Oasis of the Seas.

The Allure of the Seas is 362m long, has a tonnage of 225,000 gross tons and carries around 5,600 people. The ship features telescopic funnels, a two-deck dance hall, a theatre with 1,380 seats and an ice skating rink.

She made her maiden voyage from the shipyard in Turku, Finland, to her future home port in Florida, USA, in November 2010.

i. The Allure of the Seas is one of **the longer/ longest** cruise ships in the world.

ii. The Allure of the Seas is 5 cm **longer/ shorter than** the Oasis of the Seas.

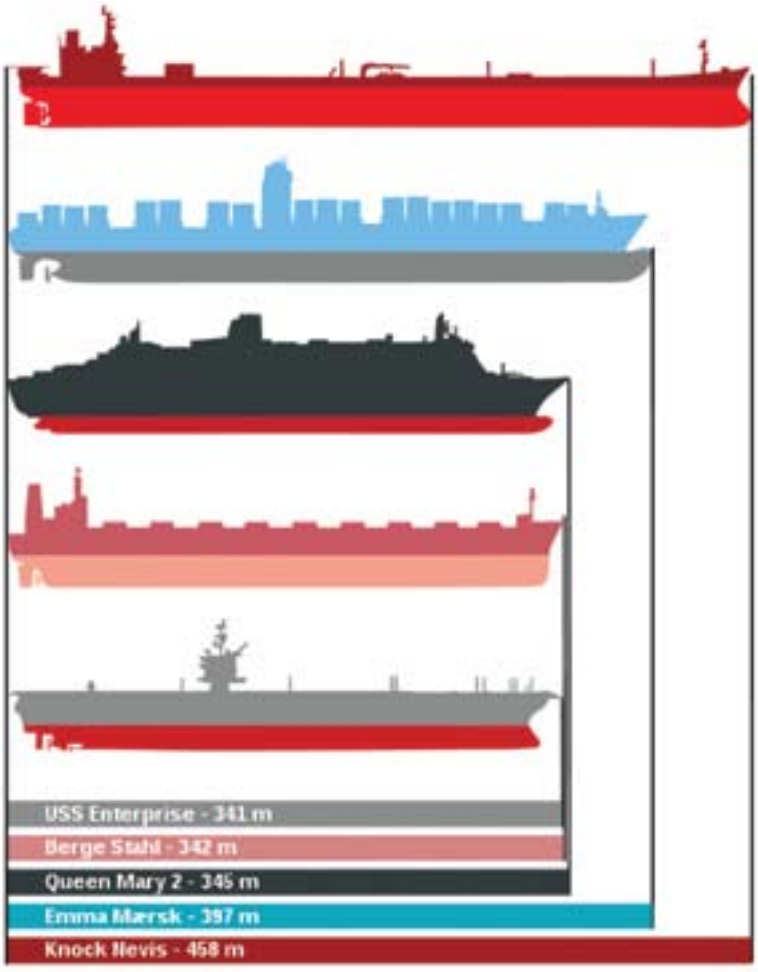
b) The top 5 largest vessels.

i. Look at the graph on the next page and fill in the correct type of vessel in the following table. Use the types in the box.

Bulk carrier	Aircraft carrier	Ocean liner
Supertanker		Container ship

Name	Type	Length	Status
1. Knock Nevis (Seawise Giant)		458	Scrapped
2. Emma Maersk		397	In service
3. Queen Mary 2		345	In service
4. Berge Stahl		342	In service
5. USS Enterprise		341	In service

1. Information on ship comparisons and top 100 largest ships from www.largestshipintheworld.com.



Glossary

allure	quality of being powerfully and mysteriously attractive and fascinating
sister ship	a ship that is one of two (or more) similar ships built at the same time, a ship of the same class and identical design to another ship
feature (v)	to have as a prominent attribute or aspect
maiden voyage	the first voyage of a ship
scrap	to discard or remove from service (an old or inoperative vessel), especially so as to convert it to scrap metal

ii. In pairs, ask and answer the following questions. Add some of your own questions, like the ones given, to compare the ships.

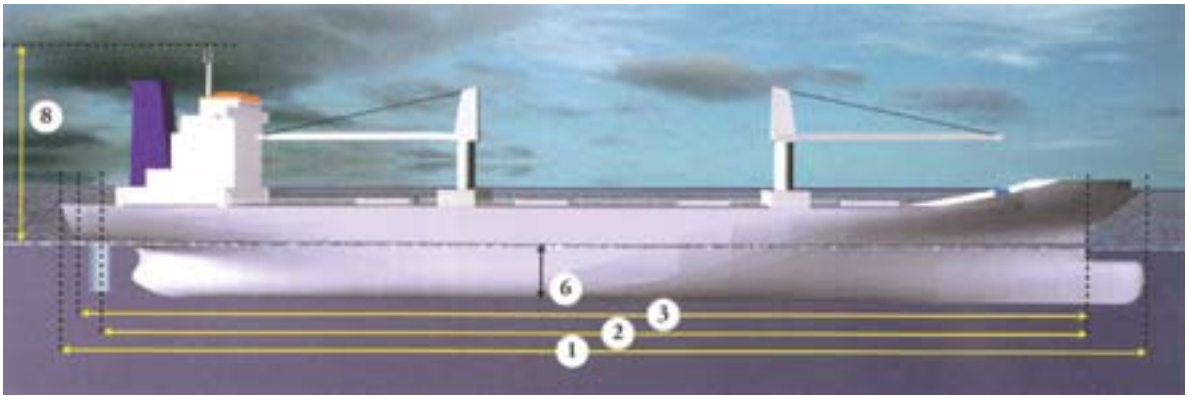
1. What is the world's largest ship in operation now?
2. Which one is bigger, the Queen Mary or the Oasis of the Seas?
3. Is the world's largest bulk carrier longer than the largest container ship?

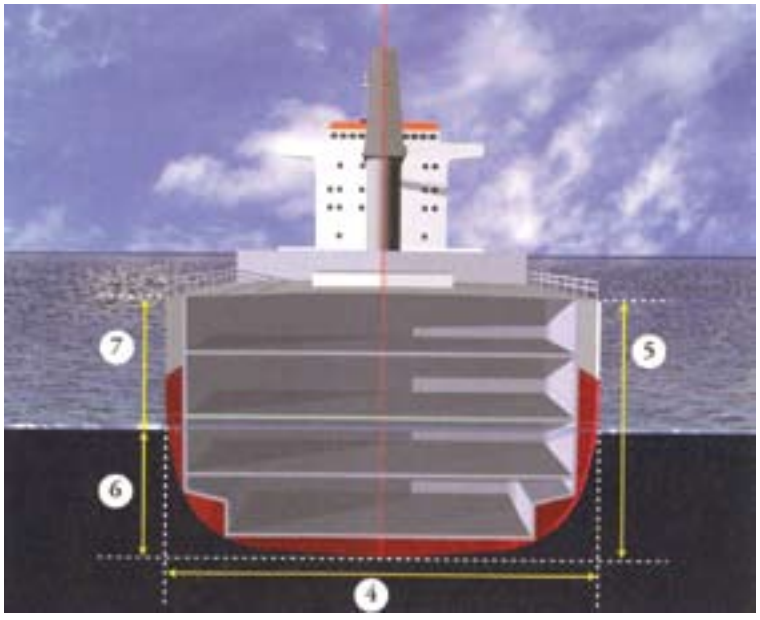
III. Ship dimensions

a) Write the dimensions shown in the pictures.

Draught	Air Draught	Depth	Breadth overall
Length overall	~~Length between perpendiculars~~	Freeboard	~~Length on the water line~~

1. ……
2. ……Length between perpendiculars……
3. ……Length on the water line ……
4. ……
5. ……
6. ……
7. ……
8. ……





b) Match the dimensions to their definitions.

Freeboard	Beam	Draught
Air draught	Depth	Length overall

1. _____: width (breadth) of the hull
2. _____: height from baseline to uppermost continuous deck
3. _____: the maximum depth underwater
4. _____: the horizontal distance over the extremities, from stem to stern
5. _____: the distance between the water line and the top of the deck at the side
6. _____: the vertical distance between the water line and the highest point of the ship

2. Function and operation of equipment on board

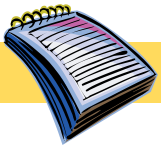
I. Communication safety equipment

– The following are devices related to communication safety. Match the words to the descriptions. The first one has been done for you.

NAVTEX	~~GMDSS~~	Voyage Data Recorder	EPIRB	SART

1	***2***
A GMDSS installation is legally required by SOLAS 74. It ensures that, irrespective of the ship's location, reliable shore to ship and ship to shore communication is possible in an emergency using radio and/or satellites.	*A _____ receiver receives and prints weather forecasts and warnings as well as distress messages.*

3	***4***	***5***
Life rafts and lifeboats are difficult to see on radar because of their poor radar-reflecting properties. A _____ is a device which, on receiving a radio signal, answers by transmitting a radio signal of the same frequency. This makes the life raft or lifeboat visible on the radar screen.	*The _____ is of use in case the ship is sinking so fast that the crew does not have the time to warn the world of a disaster. It rises to the surface of the water (through a hydrostatic release) and it transmits the MMSI number of the ship to a satellite, which, in turn, will warn a ground station. When it starts transmitting, a bearing can be taken and the position of the ship can be determined.*	*A _____ is an apparatus storing in a secure and retrievable form, the data of navigation, such as position, movement, speed, course, command and control (recording of voice on the bridge, etc.) leading up to and after an incident or accident.*



Glossary

irrespective of	not taking (something) into account, regardless of
reliable	able to be trusted, consistently good in quality or performance, dependable
properties	attributes, qualities or characteristics of something
determine	to establish or ascertain exactly (by calculation or research)
lead up to	to immediately precede, gradually result in

II. What do you use this for?

To explain the equipment used for specific tasks you can use
to + **infinitive** / **for** + **ing**

What do you use a chipping hammer for?
You use it **to chip** the rust off. You use it **for chipping** the rust off.

In general,

- you can use **What**…**for**? to ask about the purpose of an object:

What** is this switch **for?

- you can use **for** + **–ing** to say what the purpose of an object is. **To** + **infinitive** is also possible.

*This knife is only **for cutting** bread. (or …**to cut** bread)*

– What is the name of each hand tool? What do you use it for? Write full sentences next to each picture. Use both to … and for … .

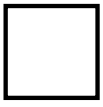
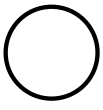
Pliers	~~turn screws~~
Hacksaw	cut metal
~~Screwdriver~~	scrape off paint
Scraper	hold and turn a nut or bolt
(Single German) Spanner	grip small objects and bend or cut wire

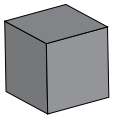
NAME OF TOOL	USE OF TOOL

		
		
		
	Screwdriver	You use it for turning screws. You use it to turn screws.

III. Describing shapes and dimensions

a) Fill in the missing words in the following table.

Geometrical figure/ 3D object	Shape	Adjective
	square	square
	triangle	
	circle	circular
	rectangle	

Geometrical figure/ 3D object	Shape	Adjective
		hexagonal
	sphere	spherical
	cylinder	
	cone	conical
		cubic

- You can say,

  It is circular in shape. **OR** It is shaped like a circle.

- You can also use the letters of the alphabet or well-known shapes like:

  S = S-shaped + = cross-shaped

- For dimensions, use the adjective and say, e.g.:

  It is 20 cm **long** / **high** / **wide / broad**

b) Describe the appliances shown in the pictures below and talk about their function and operation (shape, dimensions, location on board, etc.). What is shown in the two pictures? Write the name under each picture.

a).....

b) .....

IV. Navigation and nautical equipment on the bridge

Navigation and nautical equipment[2]

Generally, the following equipment is installed on the bridge:

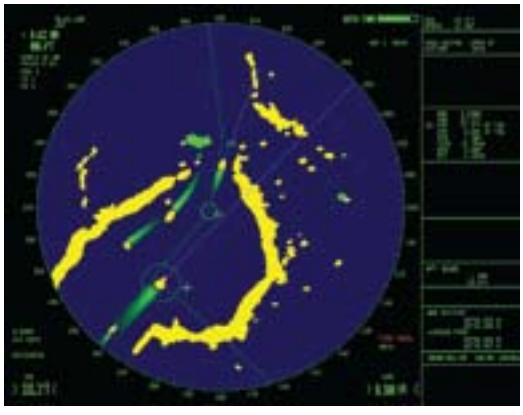
- A **radar with ARPA** (Automatic Radar Plotting Aid), an automatic collision warning installation, with a rotating transmitting/receiving antenna, working in the X-band, 3 cm wavelength.
- A **second radar**, for ships larger than 500 GT, usually working on a different wavelength, as the two types of radar give different pictures of heavy rain showers, swell/wave reflections, fog, etc., working in S-band 10cm wavelength.
- Two independent **GPS** positioning systems, or even more accurately, **DGPS**, with an omni directional satellite receiving antenna and a parabolic correction antenna.
- A water depth meter: **echo sounder**, with printer.
- A **speed indicator** with distance counter (**log**).
- A **magnetic standard compass**, which has to be calibrated for the magnetic influence of the ship's steel. The deviation of the compass from the magnetic North has to be minimized by adding small magnets to the compass.
- A **gyro compass**
- An **automatic pilot**
- **AIS** automatic identification system

– Look through the text above and find words according to the definitions.

1. A system of machinery set up for use: _____
2. It revolves, turns around an axis: _____
3. Capable of transmitting or receiving signals in all directions: _____
4. Instrument (gauge or meter) used to monitor the speed: _____
5. Adjusted, marked with a standard scale of readings: _____
6. Deflection of a compass needle caused by local magnetic influence: _____

V. Radar controls

The marine radar has performance adjustment controls for brightness and contrast, gain, tuning, sea clutter and rain clutter suppression, and other interference reduction. Other common controls consist of range scale, bearing cursor, fix/variable range marker or bearing/distance cursor.



Radar screen

2. Ship Knowledge, 5th ed., 2008, p. 310.

– ***What are the following controls for? How do you use these controls? Use the phrases in the box to make full sentences as in the example.***

reduce the effect of rain on the display take a bearing measurement ✓suppress sea clutter	adjust the sensitivity of the receiver generate a range ring

1. Anti-sea clutter: ……You use the anti-sea clutter control to suppress sea clutter……
2. Gain: ……
3. Range ring: ……
4. Electronic bearing indicator: ……
5. Anti-rain clutter: ……

VI. NAVTEX

– ***The officers are talking about the NAVTEX receiver.[3] Listen to the dialogue and do exercises i-iv below.***

i. Which of the following comparative adjectives can you hear in the dialogue? Circle the ones you can hear.

– more modern
– less complicated
– more sophisticated
– easier to operate
– quicker
– more convenient

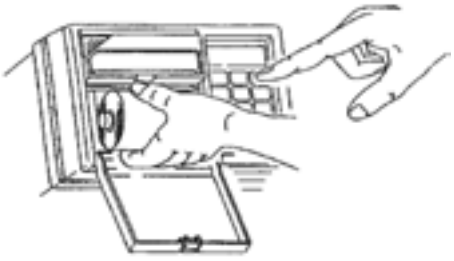
NAVTEX receiver

ii. Which sentence goes with the picture, A, B or C?

A. Press the POWER key to turn on the main power.

B. Hold the FEED key pressed until the paper is pulled in.

C. Press the ILLUM key and change it from Half-light ➔ Light.



iii. What do each of the following keys on the control panel do? Match.

TEST ➔	controls the lighting of display
ILLUM ➔	does a self-diagnostic test
SAVE ➔	feeds the printing paper
FEED ➔	stores received messages

3. Information from Operation Manual for NAVTEX JRC NCR-300A.

iv. What do you use the keys above for?

You use the TEST key for / to….

VII. Operation manuals: SART, Radar

– Look at the following excerpts from technical manuals[4]. Fill in the missing verbs.

position	press	release	hold	click

GMDSS SART TESTER MANUAL	RADAR OPERATING INSTRUCTIONS
Controls and connections A four-row indicator and keyboard are on the front panel of the device. The right upper key ON turns on the device. The left key OFF turns off the device. The keys of lower row <, ESC, ENT, > provide for menu advancing and menu execution. The plug for power unit connection is in the lower part of the device. **Turn ON / OFF** To turn on the device (1) _____ the key ON and (2) _____ it till battery voltage U and internal SART temperature appear on the display and beep sounds. (3) _____ the key. In case the key is held 5 seconds longer the device will turn off automatically.	**Navigation** **Introduction** The display of waypoints, routes and steering data, is switched ON and OFF using the navigation (NAV) soft key. This key also provides access to the NAVIGATION menu and the editing facilities for: • Defining own ship's position; • Switching route display ON and OFF. **Accessing the NAVIGATION Menu** 1. _____ (4) the screen cursor over the "NAV" soft key. 2. Left _____ (5) to reveal the NAVIGATION menu. The Route Display can be switched-ON and OFF from within the menu. A left click on the EXIT NAVIGATION soft key will close the menu.

4. Bridge Master E Radar Operating Instructions and SART Manual.

VIII. Multi-word verbs for mechanical operations

Multi-word verbs include phrasal verbs, prepositional verbs and phrasal-prepositional verbs.

Look at these verb definitions:

Turn

• **turn** something **on** ▶ start the operation or flow of something by means of a switch, button or a tap.
• **turn** something **off** ▶ stop the operation or flow of something by means of a switch, button or a tap.
• **turn** something **down** ▶ adjust a control on an electrical device to reduce the volume, heat, etc.
• **turn** something **up** ▶ increase the volume of strength of sound, heat, etc. by turning a knob or switch on a device.

Switch

• **switch** something **off** (or **on**) ▶ turn an electrical device off (or on).
• **switch down** (also, *shut down*, *close down*) ▶ stop or switch off a piece of machinery.

Start

• **start up** ▶ cause a machine to begin to work.

– Use the table above to fill in the gaps with the correct preposition.

1. Is the heater on? Yes, it's set to 21°C.
   Turn _____ the heater to 23 °C, it's cold in here.
2. They forgot to switch _____ the hold ventilator and without proper ventilation the perishable cargo was destroyed.
3. Sorry I'm late. I couldn't start _____ my car in the morning so I had to take the bus.
4. Quickly, turn the pressure _____, it is increasing uncontrollably.
5. Remember to turn _____ the gas before you leave.
6. The radio is too loud. Please, turn the volume _____.
7. After a long day at work, I went home, turned _____ the TV and spent the entire evening watching soap operas.

IX. SMCP multi-word verbs for various operations

a) Fill in the prepositions.

on	out	up	off	over
on	out	up	off	by

1. **fill** ____: cause a container or space to become full
2. **stand** ____: be ready to deal or assist with something
3. **stand** ____: continue on the same course
4. **take** ____: become airborne
5. **take** (clothing) ____: remove clothing from your body
6. **put** (clothing) ____: place clothing on your body
7. **put** ____: extinguish something that is burning
8. **take** ____: become responsible for a task in succession to another
9. **carry** ____: perform a task
10. **pick** ____: go and collect someone

b) Choose some of the verbs from exercise (a) to fill in the gaps.

1. Do not alter course. You must _____.
2. The helicopter is ready to _____.
3. Do not attempt to _____ the fire.
4. _____ and dispose of contaminated clothing.

c) Match the following to make full phrases.

1. take over …	…warm clothes
2. put on …	…survivors
3. fill up …	…the watch
4. carry out …	…on VHF channel 16
5. pick up …	…the tank
6. stand by …	…search pattern 6

3. SMCP: Pilot on the bridge

[A2 / 3.1–3.4: Propulsion System / Manoeuvring / Radar / Draught and Air draught]

A. Match the words to make correct collocations.

pilot	speed	draught	power	antenna	propeller

1. Maximum manoeuvring …….
2. Left-hand …….
3. Automatic ……..
4. Air ……..
5. Fairway …….
6. Radar …….

B. *The Pilot is on the bridge. S/he asks certain questions. Put the sentences under the correct heading.*

Propulsion system	Manoeuvring
	What is the advance and transfer distance in a crash-stop?

1. Is the turning effect of the propeller very strong?
2. How long does it take to change the engines from ahead to astern?
3. ~~What is the advance and transfer distance in a crash-stop?~~
4. Is the engine a diesel or a turbine?
5. What notice is required to reduce from full speed to manoeuvring speed?
6. Do you have single or twin propellers?
7. Do you have a bow thruster?
8. What is the full sea speed?

C. *Fill in the blanks with the words in the box.*

controllable	manned	inward
blasts	revolutions	blind
pilot	diameter	available

1. Is the engine-room _____ or is the engine on bridge control?
2. Is extra power _____ in an emergency?
3. Do you have a _____ or fixed pitch propeller?
4. The twin propellers turn _____ when going ahead.
5. What are the maximum _____ ahead?
6. I require the _____ card.
7. Give 2 prolonged _____ on the whistle.
8. Does the radar have any _____ sectors?
9. What is the _____ of the turning circle?

D. *Match the two halves to make full sentences.*

1. Stand by look-out	____ is 7 meters.
2. Maintain	____ is operational.
3. Change the radar	____ on the forecastle.
4. My draught forward	____ a speed of 4 knots.
5. The radar	____ to true-motion north-up.

E. *Write up the missing letters in the following terms.*

1. The propeller blades can be turned around the blade-axis, thereby changing the propeller pitch:
   • C _ _ _ _ _ _ _ _ _ _ _ (or adjustable) pitch propeller
2. A transversal propulsion device built in or mounted to the bow of a ship to make it more manoeuvrable:
   • Bow t _ _ _ _ _ _ _
3. An area which cannot be scanned by the ship's radar because it is shielded by parts of the superstructure, masts, etc.:
   • B _ _ _ _ s _ _ _ _ _
4. An emergency reversal operation of the main engine(s) to avoid a collision:
   • C _ _ _ _ - s _ _ _

F. *Briefing on navigational aids and equipment status (SMCP B1/1.3).*

Which of the following sentences are offering a briefing on navigational aids and navigational equipment status? Tick ☑ appropriately.

1. Port side / starboard side radar is at 6 miles range scale. ☐
2. The radar is relative head-up. ☐
3. Wind increased within last 2 hours. ☐
4. GPS is not in operation. ☐
5. The latest fire patrol was at 09.00 hours UTC. ☐
6. The echo-sounder recordings are unreliable. ☐
7. I changed to manual steering at 12.00 hours UTC. ☐
8. Navigation lights are switched on. ☐

Pilot Card Information

Act out a dialogue to fill in information by using a Pilot Card.

Student A: Ask your study partner and note down the following Ship's Particulars and Engine information.

e.g. What is …(the name / call sign / etc.) of the vessel?

Student B: Use the Pilot Card on page 494 to provide the information your study partner is asking for.

SHIP'S PARTICULARS	ENGINE
Name:	**Type of engine:**
Call Sign:	**Horse power:**
Deadweight:	**Revolutions per minute for slow astern:**
Draught aft:	**Speed at full ahead / loaded:**
Draught forward:	**Speed at full ahead / in ballast:**
LOA:	
Breadth:	

Round-up

A. Vocabulary Consolidation Self-Assessment.

Tick ☑ what you can do. Cross ☒ what you still find hard to do in English.

- ☐ Describe ship's dimensions
- ☐ Compare vessels
- ☐ Talk about the function and operation of communication equipment
- ☐ Describe equipment in terms of shape and dimensions
- ☐ Understand the main verbs we use for mechanical operations
- ☐ Use SMCP for Pilot briefing

B. Class Project.

Find out more about one of the largest ships in the world (presented in this unit) and present to class its history, particulars, operation, etc.

C. Fill in the gaps with the words in the box.

features	scrap	retrievable
sister ships	maiden	

1. The tanker was eventually sold for _____.
2. The hotel _____ a large lounge, a sauna and a solarium.
3. The _____ voyage of the Titanic was disastrous.
4. The _____ of the Titanic were the Olympic and the Britannic.
5. A VDR is storing data in _____ form.

D. Write the opposite.

start up	release	push down	turn off

1. press ≠ ……. the key
2. pull up ≠ ……. the handle
3. switch on ≠ ……. the navigation lights
4. shut down ≠ …….. the engine

E. Write the nouns.

1. suppress - …….
2. interfere - ……..
3. reduce - ……
4. adjust - …….
5. transmit - …….
6. install - …….

UNIT 9

What Weather Is Expected?

1. Weather conditions

2. Weather forecasts

3. SMCP

Round-up

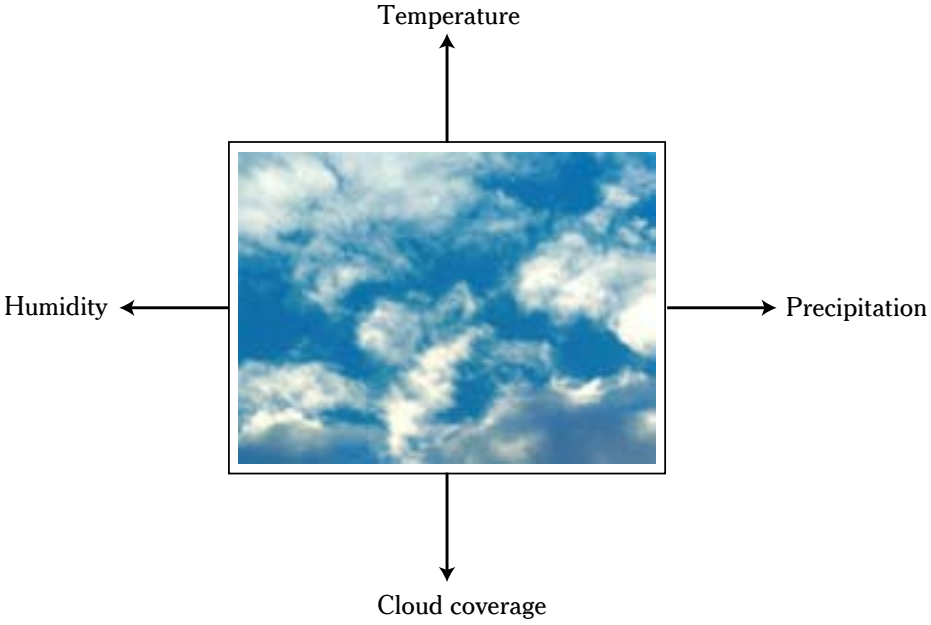
Lead-in: Check what you know.

a) Can you explain the following message? Are there gale warnings for the particular day mentioned in the message or not?

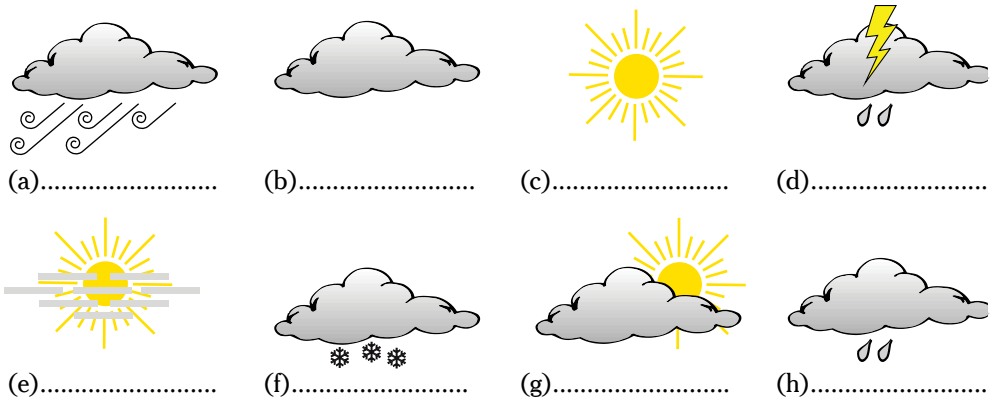
b) Look at the following weather forecast. The arrows show three different pieces of information. What are they? Choose from the following: *humidity*, *wind direction*, *temperature*, *wind force*, *visibility* and write what is shown by each arrow.

c) Look at the following words about the weather and put them in the right category.

rain	dry	clear	hot	snow	cold	wet	overcast



d) What's the weather like? Match the sentences to the pictures and write the correct sentence under each picture.



(a)..... (b)..... (c)..... (d).....

(e)..... (f)..... (g)..... (h).....

It's snowy	It's rainy	It's foggy	It's windy
It's stormy	It's cloudy	It's sunny	It's partly cloudy

1. Weather conditions

I. Types of weather

a) Look at the words related to weather in the box below and fill in the chart.

summer	~~thunderstorm~~	autumn	wet season	~~spring~~	rain	hail
tornado	blizzard	winter	hurricane (tropical cyclone)	dry season	snow	~~drizzle~~

SEASONS			
spring			
TROPICAL SEASONS			
STORMS			
thunderstorm			
PRECIPITATION			
drizzle			

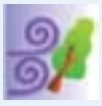
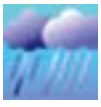
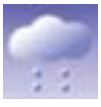
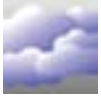
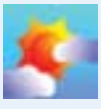
b) Look at the chart above and find the appropriate words which mean the following.

1. a storm with thunder and lightning and usually very heavy rain: ……
2. heavy violent snow storm with high winds: ……..
3. violent storm with very strong winds, especially in the Western Atlantic Ocean: ……..
   ……
4. fine, gentle, misty rain: ……
5. precipitation of spherical pellets (=small pieces) of ice and hard snow: ……..

c) Write the correct word(s) next to each symbol.

Weather Symbols[1]

– Hail
– Rain
– Partly cloudy
– Snow
– Blizzard, Snowstorm
– Drizzle, Light rain
– Dry
– Windy, Gale
– Sunny
– Freezing
– Overcast
– Cold, Chilly
– Clear
– Warm

01		Thunderstorms, Storm, Lightning	12		Cloudy
02			13		
03			14		
04			15		
05		Sleet	16		Wet, Humid
06		Showers	17		
07			18		
08			19		Hot
09		Fog	20		
10			21		
11			22		Cool

1. Source: World Meteorological Organisation, Weather icons.

d) Answer the questions, as in the example.

e.g. *What's the weather like in December in your home area?*
It's snowy and cold.

- What's the weather like in November in your home area?
- What's the weather like in February in your home area?
- What's the weather like in August in your home area?
- What's the weather like in May in your home area?

II. What's a tsunami?

a) What is a tsunami?[2] Do you know how it is caused and if it can be predicted? Read the sentences below and try to guess the correct alternative for each gap. Then listen and circle the correct answer. Fill in the gaps.

Definition 1. A tsunami or _____ is a series of ocean waves caused by the displacement of a large volume of water.	tidal wave / ocean wave
Causes 2. Tsunamis are commonly generated by _____ in coastal and marine regions.	volcanic activity / earthquakes
3. Tsunamis frequently occur in the _____ Ocean.	Atlantic / Pacific
The Indian Ocean Tsunami in 2004 4. The catastrophic Indian Ocean Tsunami in 2004 was generated when a magnitude _____ earthquake struck the coastal region of Indonesia.	7.0 / 9.0 (on the Richter scale)
5. The Indian Ocean Tsunami was over _____ meters high.	10 / 30
6. It killed 240,000 people in Indonesia and _____ people in Thailand, Sri Lanka and India.	30,000 / 60,000
Prediction 7. Predicting when and where the next tsunami will strike is currently _____.	possible / impossible
8. We can forecast the tsunami _____ and roughly what we think the impact will be.	arrival time / speed
9. Warning signs just prior to a tsunami: • if you see the water receding from the shoreline • if you see or hear approaching water (tsunami survivors described the loud sound of an approaching tsunami as similar to _____) • if you feel a strong earthquake	a freight train / heavy rain
10. If a tsunami is coming you should right away_____	evacuate the area / move to high ground

2. Source: Podcast "Diving Deeper: Episode 22 (April 21, 2010) What are tides?", US National Ocean Service.

Glossary

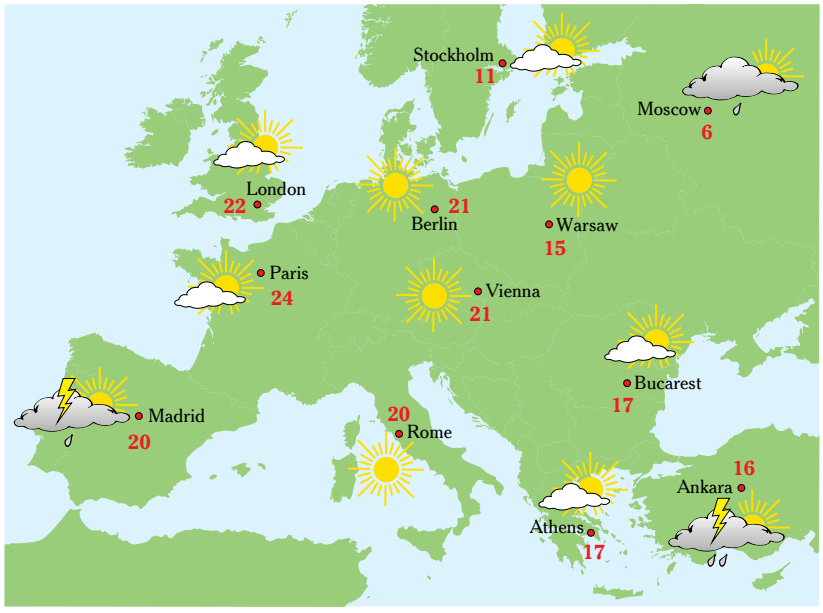
displacement	the action of moving something from its place or position; also, the volume or weight of water displaced by a floating ship, used as a measure of the ship's size, e.g. a ship with a displacement of 10,000 tons
magnitude	the size of an earthquake
roughly	approximately, but not exactly
impact	the powerful effect that something has on somebody or something
prior to	before
receding	move gradually away from a previous position

2. Weather forecasts

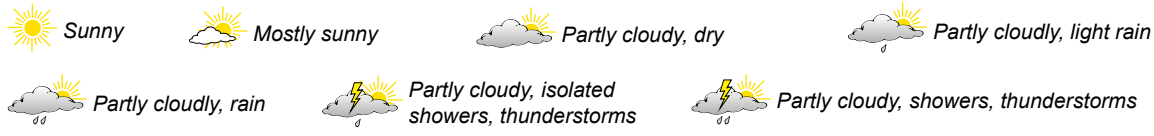
I. Weather maps: current and anticipated weather

Look at the weather map on the next page. What is the weather like in Europe?[3]

This is how we ask and answer about the weather:
Question: *What is the weather like?*
Answer: *It's rainy (or it's cold, or it's windy, etc.)*



This is the key to the weather symbols used on the map:



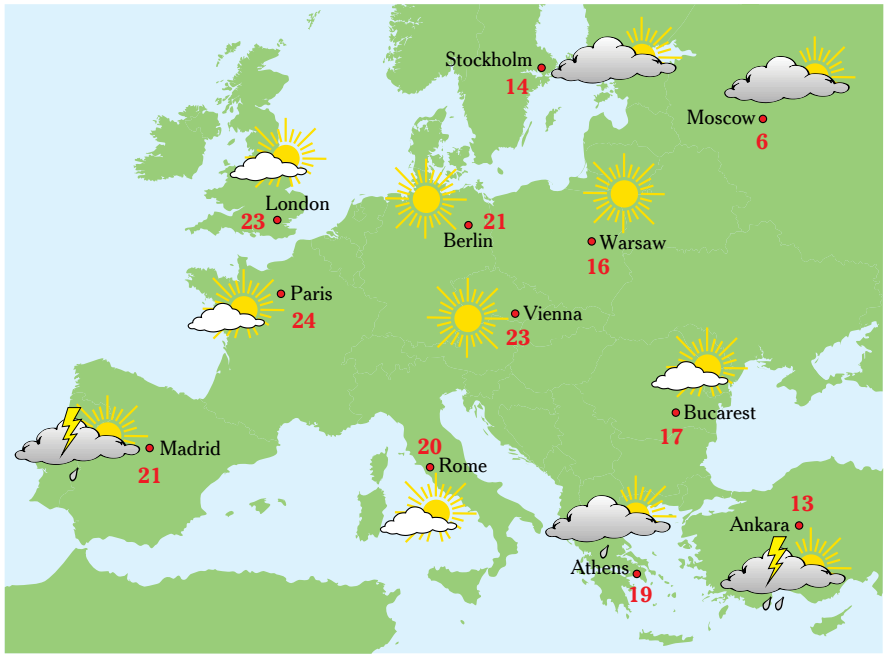
3. Weather maps and symbols from WeatherOnline.

a) Answer the questions about today's weather and temperature. Use the information on the map above and the key to the weather symbols.

1. What is the weather like in Bucarest?
   It's mostly sunny today. The temperature is 17 degrees Celsius.
2. What is the weather like in Madrid?
   .....
3. Where is the hottest weather?
   .....
4. Which is sunnier: Vienna or Stockholm?
   .....
5. What is the weather like in Athens?
   .....
6. Where is it the coldest?
   .....
7. Is Berlin hotter than London?
   .....
8. What's the weather like in Rome?
   .....
9. Is Warsaw colder than Bucarest?
   .....

Look at the weather map below. What is the weather going to be like in Europe tomorrow?

This is how we ask and answer about the weather forecast:
Question: *What is the weather going to be like?*
Answer: *It's going to be rainy (or it's going to be windy, etc.)*



b) Answer the questions about the weather forecast for tomorrow. Use the information on the map above.

1. What is the weather going to be like in Rome tomorrow?
   Tomorrow it's going to be mostly sunny and warm.
2. What's the weather going to be like in London?
   .....
3. What's the weather going to be like in Madrid?
   .....
4. What's the weather going to be like in Athens?
   .....
5. What's the weather going to be like in Bucarest?
   .....
6. Where is it going to be the coldest?
   .....
7. Where is it going to be the hottest?
   .....
8. Is Ankara going to be hotter than Berlin?
   .....
9. Is Stockholm going to be hotter than Moscow?
   .....

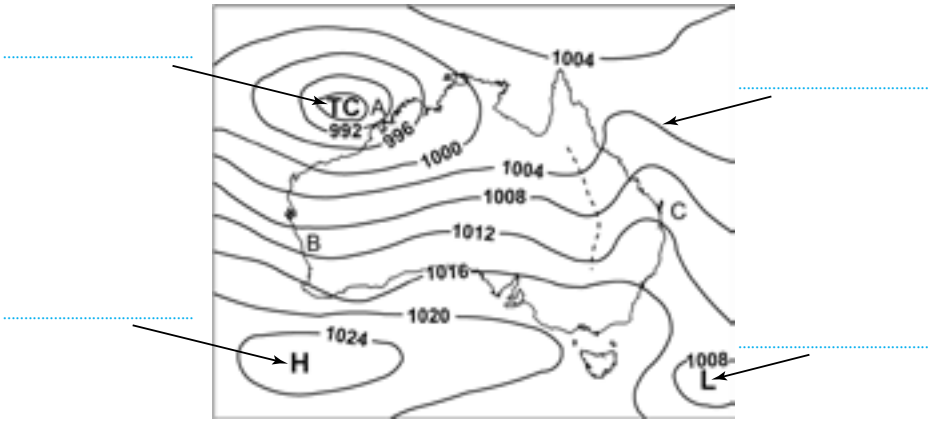
Note: *For information on using "will / be going to" in weather forecasts, go to page 526.*

c) Today's weather. Answer the following questions.

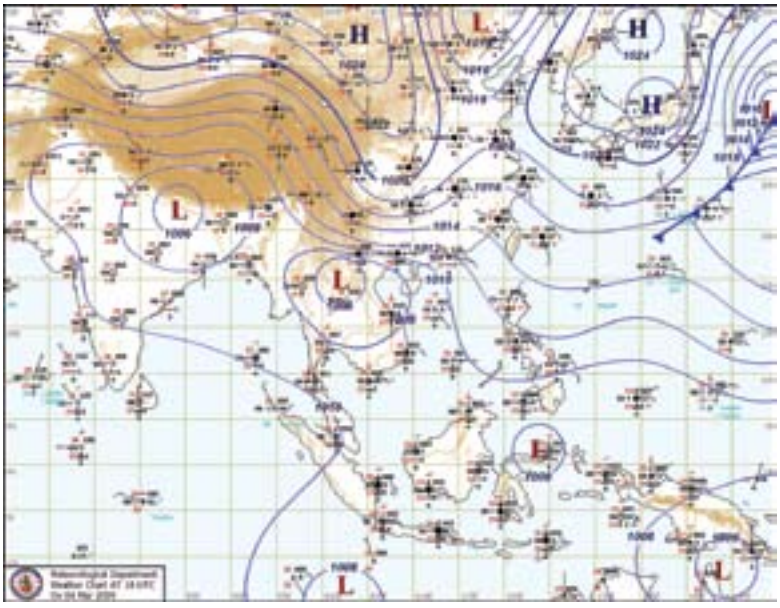
– What's the weather like where you are now?
– Do you like the weather today? What's your favourite weather?
– What is it going to be like later?

d) The following weather map features a tropical cyclone over north-western Australia. Try to find the following symbols on the map and write them next to the arrows.

Tropical cyclone	Isobar	High pressure cell	Low pressure cell



e) Look at the weather map and show the symbols you identified in the previous exercise. Can you also find the Cold Front?



II. Maritime forecast

A sea area forecast tells us what the wind direction and the wind force is going to be. Example: *Wind: easterly, force 8*

a) Write the abbreviations for the cardinal points and half cardinal points at the correct places on the compass rose.

N	S
SW	SE
W	NW
E	NE

b) To describe wind direction we say: "It's a northerly wind" or "There is going to be a northerly wind." Write the correct abbreviation in the chart below.

Direction	Adjective	Abbreviation
North	Northerly	N
West	Westerly	
South	Southerly	
East	Easterly	
Northwest	Northwesterly	
Southwest	Southwesterly	
Northeast	Northeasterly	
Southeast	Southeasterly	

c) Say and write down wind force and direction.

Student A: Say the following wind direction and force to your study partner.

1. Easterly Force 6
2. Northwesterly Force 6 to 8
3. Westerly Force 5
4. Northwesterly Force 3 to 5
5. Southerly Force 2
6. Southwesterly Force 6
7. Southeasterly Force 4 to 6

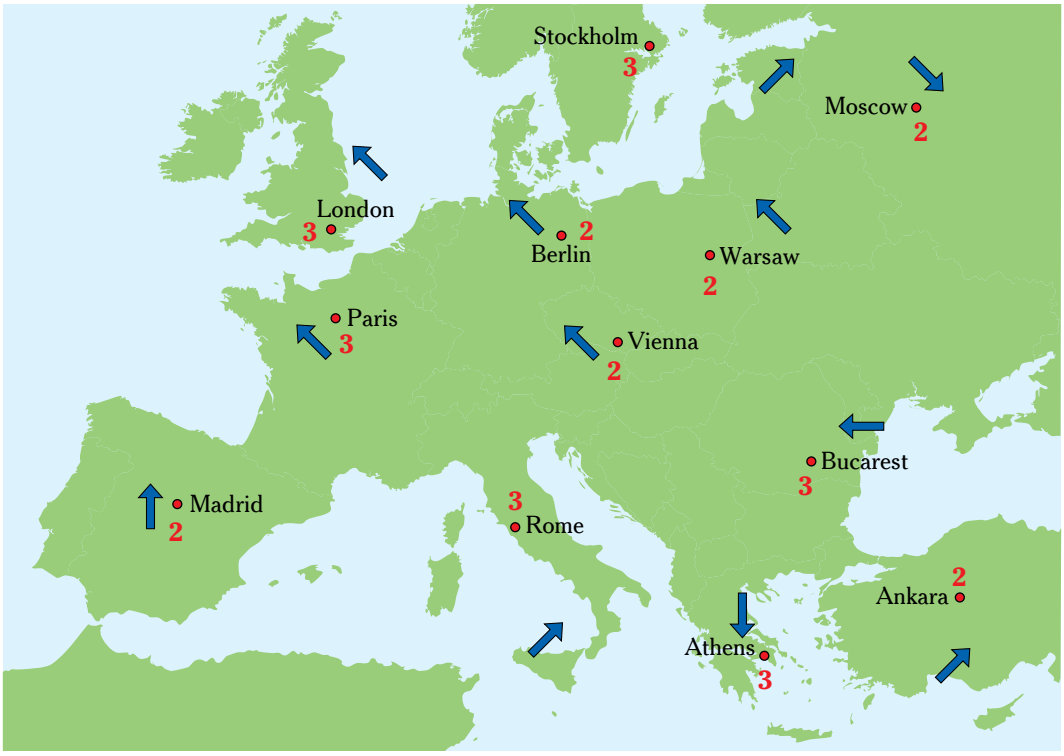
Student B: Go to page 495. Write down the information in your chart using the appropriate abbreviations.

d) Look at the weather map below. It provides a wind forecast and marks the wind direction with arrows and the wind force with numbers. Then, do exercises (i) and (ii).

i. Note down the wind direction and force using the appropriate abbreviation.
ii. Say what winds there are going to be.

e.g.: *There is going to be a southeasterly wind force 3 in London and Paris.*

Paris & London:	SE3	Ankara:	
Vienna, Warsaw & Berlin:		Rome:	
Moscow:		Athens:	
Madrid:		Bucarest:	



e) Descriptive terms of wind and sea state according to the Beaufort wind force scale. Fill in the table with the missing terms.

Rough	Phenomenal	Light breeze	Slight	Near gale
Calm	Hurricane	Smooth	Moderate breeze	Storm

Beaufort wind scale	Mean wind speed - knots	Wind descriptive terms	Mean wave height - meters	Sea state	Sea state descriptive terms
0	1		—	0	Calm
1	1-3	Light air	0.1	1	Calm
2	4-6		0.2	2	
3	7-10	Gentle breeze	0.6	3	
4	11-16		1.0	3-4	Slight – moderate
5	17-21	Fresh breeze	2.0	4	Moderate
6	22-27	Strong breeze	3.0	5	
7	28-33		4.0	5-6	Rough – very rough
8	34-40	Gale	5.5	6-7	Very rough – high
9	41-47	Strong Gale	7.0	7	High
10	48-55		9.0	8	Very high
11	56-63	Violent storm	11.5	8	Very high
12	64+		14+	9	

f) What wind force is shown in each picture? Match the pictures to the descriptions below. Write the correct wind force under each picture.

1. *Force 12* – wind speed greater than 63 knots; the air is filled with foam and spray, sea completely white; visibility very seriously affected
2. *Force 10* – wind speed 52 knots; very high waves with long overhanging crests; the surface of the sea takes a white appearance; visibility affected
3. *Force 8* – wind speed 37 knots; moderate high waves of greater length; spray may affect visibility
4. *Force 5* – wind speed 19 knots; moderate waves, becoming longer; many white horses are formed (chance of some spray)
5. *Force 2* – wind speed 5 knots; small wavelets; crests have a glassy appearance and do not break

(a).....

(b).....

(c).....

(d).....

(e).....

Glossary

crest of a wave	the curling foaming top of a wave
spray	water in small drops in the atmosphere, blown from waves
affect	to have an influence on or produce a change in something or somebody

g) Visibility definitions: Write the correct description for the visibility. Use the following terms.

good	poor	very good	very poor	excellent	moderate

Description	Range	Description	Range
	Less than 1 km		Between 10-20 km
	Between 1-4 km		Between 20-40 km
	Between 4-10 km		More than 40 km

h) Write the correct units for each reading / measurement used in weather forecasts. Choose words from the box that follows.

	Units
Wind Direction	
Temperature	
Visibility	
Sunshine	
Humidity	
Snow accumulation	
Rainfall	Millimetre (mm)
Pressure	

Kilometre (km)	Hectopascal (hPa)	S, SSW, SW, etc. (16-point compass)	Degrees Celsius (°C)
Percentage (%)	Hour (hr)	Centimetre (cm)	~~Millimetre (mm)~~

i) The following phrases are part of a sea area forecast. What does each phrase refer to?

WIND	VISIBILITY
WEATHER	SEA STATE

- …….. Moderate or good, occasionally very poor
- …….. SE 4 or 5, veering NW 5 to 7 later
- …….. Slight
- …….. Occasional rain

j) Put the following vocabulary into the appropriate categories (some words may fit into more than one category).

moderate	fog patches	southeasterly	poor
cyclonic	variable	rough	showers
backing	slight	veering	good

WIND	**SEA STATE**	**WEATHER**	**VISIBILITY**

k) You are going to listen to a shipping forecast issued on 21 April 2011. Read the information below and do the exercises that follow.

The shipping forecast is issued by the Met Office on behalf of the Maritime and Coastguard Agency[4].

i. There is a gale warning – which area is it for? Trafalgar, Biscay or Shannon?
ii. Fill in the missing words:

1. Viking / North Utsire / South Utsire
   - **Wind:** Variable, becoming mainly easterly later, 3 or 4
   - **Sea State:** Slight or moderate
   - **Weather:** Occasional rain or showers, fog patches
   - **Visibility:** Moderate or _____, occasionally very poor
2. Forties / Cromarty / Forth / Tyne
   - **Wind:** Variable, becoming easterly or southeasterly 3 or 4
   - **Sea State:** Slight
   - **Weather:** Fog banks, occasional _____ at first
   - **Visibility:** Moderate to very poor
3. Dogger / Fisher / German Bight / Humber
   - **Wind:** _____, becoming east or southeast 3 or 4
   - **Sea State:** Slight
   - **Weather:** Fog patches clearing
   - **Visibility:** Moderate or good, occasionally very poor
4. Thames / Dover / Wight / Portland / Plymouth
   - **Wind:** East or northeast veering east or southeast 3 or 4, occasionally 5
   - **Sea State:** Slight
   - **Weather:** Showers
   - **Visibility:** Moderate or good, occasionally _____
5. Biscay
   - **Wind**: _____ 3 or 4 in southwest, otherwise easterly or southeasterly 4 or 5
   - **Sea State:** Moderate
   - **Weather:** In north, mainly fair. In south, thundery showers, fog patches in southwest
   - **Visibility:** Moderate or good, occasionally very poor in southwest
6. FitzRoy / West Sole
   - **Wind:** Cyclonic or variable 3 or 4, occasionally 5 later, but becoming northwesterly 5 to 7 in far west later
   - **Sea State:** Moderate or rough
   - **Weather:** Rain or thundery showers, _____ patches
   - **Visibility:** Moderate or good, occasionally very poor
7. East Sole / Lundy / Fastnet / Irish Sea / Shannon
   - **Wind:** _____ or northeasterly veering southeasterly 3 or 4, occasionally 5 later
   - **Sea State**: Slight or moderate
   - **Weather:** Showers
   - **Visibility:** Moderate or good, occasionally poor

4. Source: BBC Weather, Shipping Forecast.

8. Rockall / Malin
   - **Wind:** Variable 3 or 4 becoming southeasterly 4 or 5, occasionally 6
   - **Sea State:** Moderate or rough
   - **Weather:** Occasional rain or _____
   - **Visibility:** Moderate or good, occasionally very poor
9. Hebrides / Bailey / Fair Isle / Faeroes
   - **Wind:** Southwest backing southeast 4 or 5, occasionally 6, decreasing 3 for a time
   - **Sea State:** Moderate or rough
   - **Weather:** Showers, fog patches
   - **Visibility:** Moderate or good, occasionally very poor
10. Southeast Iceland
    - **Wind:** Southwesterly _____ southeasterly 5 or 6, decreasing 4 for a time
    - **Sea State:** Rough
    - **Weather:** Showers, rain in west later
    - **Visibility:** _____ or good

Glossary

fog bank	a distinct mass of fog, especially at sea
fog patches	small areas of fog

III. VHF weather forecast

a) Listen to the weather forecasts for two areas in North America (from NOAA).[5]

i. For the 1st clip:
What weather is expected? Tick (✓) appropriately.

– dry weather, clear skies, temperatures a bit above normal, with a slight chance of showers, thunderstorms and cooler temperatures over portions of the area.

– rainy weather, with showers and thunderstorms, temperatures a bit cooler than normal.

ii. For the 2nd clip:

– Listen to the recording and answer the following question:

What area is the forecast for?

– Listen again and circle the phrases (a or b) that you hear:

1. *a.* Gale warning
   b. Storm warning
2. *a.* Today, NE winds 10-15 knots increasing to 20 knots late this morning
   b. Today, NE winds 15-20 knots increasing to 30 knots late this morning
3. *a.* Tonight north gale 35 knots diminishing to 30 knots
   b. Tonight south gale 35 knots diminishing to 30 knots
4. *a.* Rain in the evening
   b. Hail in the evening
5. *a.* Chance of heavy showers in the afternoon
   b. Chance of rain and showers in the afternoon
6. *a.* Waves 15-17 feet subsiding to 5 feet
   b. Waves 5-7 feet subsiding to 3-5 feet

b) The following phrases are taken from the weather forecasts. Look at the key words used.

- Frost **is anticipated** for SE Kansas, chance of precipitation 30%.
- A strong cold front **is expected** to arrive on Sunday.
- **Forecast** for the coastal waters of St Mateo, California:…

Cross the odd one out:

i. prediction – forecast – prospect – prognosis
ii. expect – anticipate – wait for – advance

c) Create a VHF weather report. Using information from exercise (k) on page 202, write a weather report which includes two of the areas mentioned (Biscay and FitzRoy). Perform your weather report for the class.

Start like this: *This is the sea area forecast for Biscay.*

5. National Oceanic and Atmospheric Administration Weather Radio.

3. SMCP

I. Safety communications and briefing on meteorological conditions [A1/3.1 & B1/1.5]

Look at how we use **"is"**/ **"is expected"** for meteorological conditions:

- Ask about current wind direction / force:
  *What **is** wind direction in position 20° 08'35"S, 118° 31'41"E?*
  Wind direction SSW, force Beaufort 6 in position 20° 08'35"S, 118° 31'41"E.

- Ask about expected wind:
  *What wind **is expected** in position 20° 08'35"S, 118° 31'41"E?*
  *The wind in position 20° 08'35"S, 118° 31'41"E is expected from direction SSW, force Beaufort 6. Wind **is expected** to increase.*

a) Use "what is…" or "what … is/are expected" to ask about the following.

- Latest gale warning
- Visibility
- Sea state
- Next weather report
- Expected ice situation
- Expected maximum winds

b) Match the answers to the questions that follow. Write the correct answer for each question.

– Maximum winds of 40 knots are expected within a radius of 3 kilometres.
– Ice situation is expected to deteriorate in your position.
– The barometer is dropping rapidly.
– Next weather report is at 13.00 hours UTC.
– Visibility is variable.
– Sea moderate.
– Ice warning. Iceberg reported in area around lightship G3.

1. What is the latest ice information?
   ……
2. What is visibility in your position?
   ……
3. What is sea state in your position?
   ……
4. When is next weather report?
   ……
5. What ice situation is expected in my position?
   ……
6. What maximum winds are expected in the storm area?
   ……
7. What is barometric change in your position?
   ……

c) Fill in the following exchange with these words: expected, radius, veering, latest.

VESSEL ↓	MET STATION ↓
What is the _____ gale warning?	
	The latest gale warning is as follows: Gale warning. Winds at 12.00 hours UTC in sea area Danang are from direction SW and force Beaufort 8 _____ to W.
What maximum winds are _____ in the storm area?	
	Maximum winds of 9 knots are expected within a _____ of 3 kilometres.

d) Match the opposites.

backing
improve
increase
drop
reported

1. _____ ≠ decrease (wind, depth of water, visibility)
2. _____ ≠ veering (wind direction)
3. _____ ≠ located (an object for navigational warning)
4. _____ ≠ deteriorate (ice situation)
5. _____ ≠ rise (atmospheric pressure)

e) Write up the adjectives used for each heading.

- SEA STATE; s _ _ _ _ h, m _ _ _ _ _ _ e, r _ _ _ h
- SWELL; s _ _ _ _ t, m _ _ _ _ _ _ e, h _ _ _ y
- VISIBILITY; r _ _ _ _ _ _ _ _ d, p _ _ r, v _ _ _ _ _ _ e

f) Fill in the missing words. Use the words given in the box.

current	assistance	deteriorate	increased	restricted

1. The charted depth of water is _____ by 2 meters due to winds.
2. The direction of the _____ will change in 3 hours.
3. Visibility is _____ by snow.
4. Navigation is only possible with icebreaker _____.
5. WARNING. Ice situation is expected to _____ in your position.

g) Match the following to create correct collocations.

1. Restricted	☐ tide
2. Meteorological	☐ state
3. Charted	☐ wind
4. Sea	☐ wave
5. High	☐ visibility
6. Variable	☐ depth
7. Gale	☐ conditions
8. Abnormal	☐ warning

h) Put the words in the correct order and write the full sentences.

1. is expected / within / to change / the next 2 hours / visibility.
   ……..
2. tides / abnormally / are expected / at about 1200 hours UTC / low.
   ……..
3. fog / is / signal / automatic / switched on.
   ……..
4. around Eurobuoy No 2 / area / closed / for navigation / temporarily.
   ……..

II. NAVTEX abbreviations for weather forecasts

a) Common abbreviations for international NAVTEX service[6].

Write the NAVTEX abbreviations for weather forecasts. Use the abbreviations listed below for help and check your answers.

		[nouns]
1.		Forecast
2.		No change
3.	NOSIG	No significant change
4.		Showers
5.		Visibility

		[adverbs]
1.		Locally
2.		Occasionally
3.		Quickly
4.		Rapidly
5.	SLWY	Slowly

		[-ing, change in weather]
1.		Backing
2.	BECMG	Becoming
3.		Decreasing
4.		Improving
5.		Increasing
6.		Intensifying
7.		Moving
8.		Veering
9.		Weakening

		[adjectives]
1.		Expected
2.		Frequent
3.		Heavy
4.		Isolated
5.		Moderate
6.		Next
7.		Possible
8.		Scattered
9.		Severe
10.	SLGT	Slight
11.		Strong
12.		Temporary
13.		Variable

QCKY	FRQ	BACK	WKN	ISOL	~~BECMG~~	MOD
SEV	VRB	RPDY	MOV	~~SLGT~~	VIS	STRG
OCNL	HVY	POSS	FCST	NC	IMPR	NXT
EXP	INCR	~~SLWY~~	VEER	~~NOSIG~~	SHWRS	INTSF
DECR	SCT	LOC	TEMPO			

6. World Meteorological Organisation: GMDSS.

b) NAVTEX categories of messages: Fill in the missing words.

Reports	Messages	Forecasts
Pirate	Gale	Rescue

A	Navigational Warnings	**F**	Pilot service _____
B	_____ Warnings	**G**	AIS information
C	Ice _____	**H**	Loran C information
D	Search and _____ information and _____ warnings	**J**	Satnav information
E	Weather _____	**Z**	No messages on hand

c) Match the opposites.

Rapidly
Intensifying
Slight
Decreasing
Veering

1. Weakening ≠ .....
2. Increasing ≠ .....
3. Backing ≠ .....
4. Slowly ≠ .....
5. Severe ≠ .....

III. Message markers: Warning, Advice, Request, Intention

- Adding the marker "WARNING" at the beginning of a message implies the intention of the sender to inform others about danger. The recipient of a WARNING should pay immediate attention to the danger mentioned.
  e.g. "WARNING. Obstruction in the fairway."
- "ADVICE" implies the intention of the sender to influence others by a Recommendation. The decision whether to follow the ADVICE still stays with the recipient. It shouldn't necessarily be followed but it should be considered carefully.
  e.g. "ADVICE. (Advise you) stand by on VHF channel six nine."
- A "REQUEST" is asking for action from others with respect to the vessel. The use of this marker is to signal: I want something to be arranged or provided, e.g. tugs. Remember that REQUEST must not be used involving navigation, or to modify COLREGs.
  e.g. "REQUEST. I require two tugs."
- "INTENTION" informs others about immediate navigational action intended to be ta-ken.
  e.g. "INTENTION. I will reduce my speed."

a) What is the appropriate message marker for each of the following messages?

Warning	Advice	Request	Intention

1. WARNING. The ship ahead of you is not under command.
2. _____ The visibility is very poor.
3. _____ I will enter the fairway.
4. _____ A tsunami is expected by 23.00 hours UTC.
5. _____ Advise you anchor in anchorage B3.
6. _____ You are running into danger.
7. _____ Send a doctor immediately.
8. _____ I will alter course.
9. _____ Please arrange for a berth on arrival.

b) What is the appropriate message marker for each of the following messages?

Question	Information	Instruction	Warning
Request	Intention	Answer	Advice

1. _____ Is the sea state expected to change within the next 2 hours?
2. _____ No, the sea state is not expected to change within the next 2 hours.
3. _____ Abnormally low tides are expected at about 18.00 hours UTC.
4. _____ Stop immediately. You cannot enter the fairway at this time.
5. _____ My ETA at Port Hedland is 15.00 hours UTC.
6. _____ Advise you to pass astern of me.
7. _____ Buoy number 4 is unlit.
8. _____ Is visibility expected to change?
9. _____ Yes, visibility is expected to increase.
10. _____ Do not overtake.
11. _____ Please send medical assistance.
12. _____ Five vessels are at the anchorage area.
13. _____ My cargo is iron ore.
14. _____ I will stand on.
15. _____ You must alter course to SW.
16. _____ You are steering dangerous course.
17. _____ Advise all vessels keep clear.
18. _____ I require pilot.

Round-up

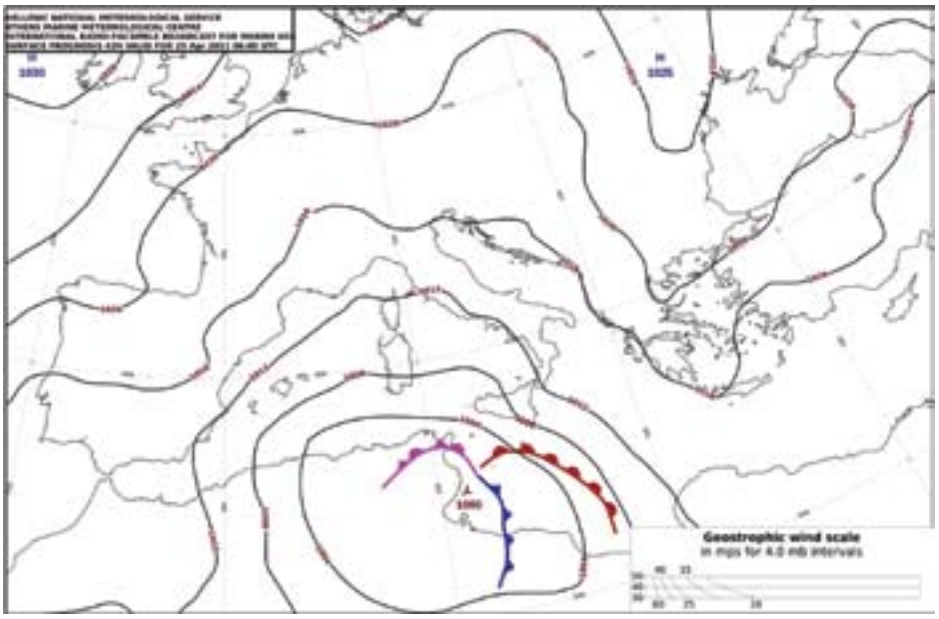
A. Vocabulary Consolidation Self-Assessment.

Tick ☑ what you can do. Cross ☒ what you still find hard to do in English.

- ☐ Understand weather forecasts
- ☐ Describe weather conditions (give 5 key words for different types of weather)
- ☐ Understand warnings regarding meteorological information
- ☐ Understand all eight SMCP message markers

B. Class Project.

– Research the catastrophic Japan Tsunami (11 March 2011) and report to class data such as: earthquake magnitude, wave height, number of casualties, etc.
– Explain the following weather map to class; get help from your meteorology instructor.



C. Terms contained in marine forecasts: write up the terms (the first letter is given, as well as a definition).

1. Visibility less than 1 kilometre: v_____ p_____
2. Visibility between 2 and 5 nautical miles: m_____
3. Winds of force 9: s_____ g_____
4. Sea state with wave length of 2.0 to 4.0 m: r_____
5. Sea state with wave length of 6.0 to 9.0 m: h_____
6. The changing of the wind direction clockwise, e.g. SW to W: v_____
7. The changing of the wind direction anticlockwise, e.g. SE to NE: b_____

D. Fill in the gaps with the words in the box.

rapidly	calm	hazard	locally	impact
partly	dry	magnitude	wet	

1. Countries in the tropical zone have two seasons: a _____ season and a _____ season.
2. The pressure is rising _____.
3. The sea is _____; it is like a mirror.
4. The earthquake reached a _____ of 7.8 on the Richter scale.
5. Businesses are beginning to feel the _____ of the economic crisis.
6. WARNING. Maritime _____ in the area. Dangerous debris at your wake.
7. Rain showers are expected _____.
8. Tomorrow it's going to be _____ cloudy and cold.

UNIT 10

Past Voyages And Sea Passages

1. *A ship's past voyage*
2. *Reporting events that occur during a sea passage*
3. *Lights, shapes and sound signals*

Round-up

1. A ship's past voyage

A. ***Read the draft log book entries about a ship's voyage last April. Draw the route of the voyage on the map.***

5 April *- Left Esperance at 1200* *- Sailed southwest and then north along the Australian coastline* *- Carried ballast*	***VESSEL'S NAME: CANNIBAL*** ***Master's additional log entries: draft notes***
8 April *- Arrived in Perth at 0800* *- Remained at the roadstead for 10 days, waiting for instructions on our next voyage*	*24 April* *- Docked at Port Hedland at 1700* *- Discharged 5,000 tonnes of iron ore* *- Technician repaired satellite telephone*
22 April *- Loaded 10,000 tonnes of iron ore* *- Sailed for Port Hedland at 2200* *- There was a breakdown in ship's communication systems (probably due to a virus); asked for technician at next port of call; 2nd Officer managed to fix the defect, except for satellite telephone*	*28 April* *- Departed at 0730* *- Sailed through Timor Sea towards South China Sea.* *- Destination: Hong Kong*

Glossary

roadstead	a sheltered offshore anchorage area for ships (also, "roads")
instructions	detailed information on how to do something
breakdown	a failure of a system
due to	because of
virus	instructions hidden within a computer program that are designed to cause faults or destroy data
entry	piece of information written in a logbook
draft	a rough written version of something that is not in its final form

B. *Use the words from the Glossary above to fill in the phrases below.*

1. _____ human error
2. a(n) _____ in the deck log book
3. the first _____ of a document / letter
4. follow the _____ given in the manual
5. a _____ in communications
6. a _____ in the software

C. *Read the report on the sea passage of MV Cannibal and complete the sentences. Choose the correct verb and write the past simple form.*

Note: *For information regarding the Past Simple tense, go to page 527.*

notice	~~sail~~	depart	stop	load	carry	discharge	repair

VOYAGE REPORT: MV CANNIBAL

Last April the MV Cannibal ……*sailed*…. from Esperance to Hong Kong. It ……..…… two times: at Perth and Port Hedland. From Esperance to Perth, the vessel ……..…….. ballast. The vessel remained anchored at the roadstead for 10 days. On 22 April we ……10,000 tonnes of iron ore in Perth. We …… a malfunction in ship's communication systems. We …….. 5,000 tonnes of iron ore in Port Hedland. A technician ……the satellite telephone. The vessel ……..…… for Hong Kong on 28 April.

D. *Complete the sentences. Use the past simple form of the verbs in brackets.*

INCIDENT: DISCOVERY OF A STOWAWAY ON BOARD

Last night we (1)_____ (have) a security breach incident on board. We (2)_____ (hear) a strange noise and, after searching the deck and all the accommodation spaces, we (3)_____ (find) a stowaway on board. He (4) _____ (be) thirsty so we (5)_____ (give) him some water and then we (6)_____ (take) him to the captain.

2. Reporting events that occur during a sea passage

Lead-in: revision of key verbs.

A. *Make sure you know the following verbs well.*

approach
arrive
disembark
discharge
repair
remain

i. Find the opposites in the box:

1. _____ ≠ load
2. _____ ≠ depart
3. _____ ≠ embark

ii. Find the synonyms in the box:

1. _____ = come near
2. _____ = stay
3. _____ = fix

B. *Match to create collocations. Use the past simple form of the verbs in the box.*

carry
sound
leave
drop
sail
release
regain

1. ..... the port
2. ..... ballast
3. ..... anchor
4. ..... an alarm
5. ..... stability
6. ..... CO_2
7. ..... from Rotterdam to Talin

C. *Write the correct verb.*

notice
refloat
evacuate
dock
inform
jettison

1. .....: come into a dock and tie up at a wharf
2. .....: see or hear, become aware of something
3. .....: to tell somebody about something, give facts, especially in an official way
4. .....: throw cargo overboard to lighten a ship
5. .....: move out of a place of danger, leaving the place empty
6. .....: float again, after being stuck on sea bottom

D. *Use the verbs of exercise C in the past simple to fill in the gaps.*

1. The first thing I _____ when I entered the galley was the smell.
2. The ship _____ at Southampton.
3. The Master _____the company of the situation and asked for instructions.
4. We _____ the accommodation spaces immediately and assembled on the main deck.
5. The ship grounded in shallow waters but they successfully _____ it.
6. There was a heavy list to starboard so we _____ cargo to make the vessel lighter.

I. Ports of call

a) Describe the stages of a sea passage orally.

i. Read the notes of the passage plan and complete them with your own ideas.
ii. Draw the route on the sea chart.
iii. Explain the events that occurred during the sea passage. You can use some of these phrases:

- Last May the vessel operated in …
- We loaded cargo …
- We left (Taipei) on …
- The weather was …
- We arrived at …
- The next port of call was …
- We discharged …
- We started from …
- Then we sailed to …
- We prepared for …

PASSAGE PLAN Notes:

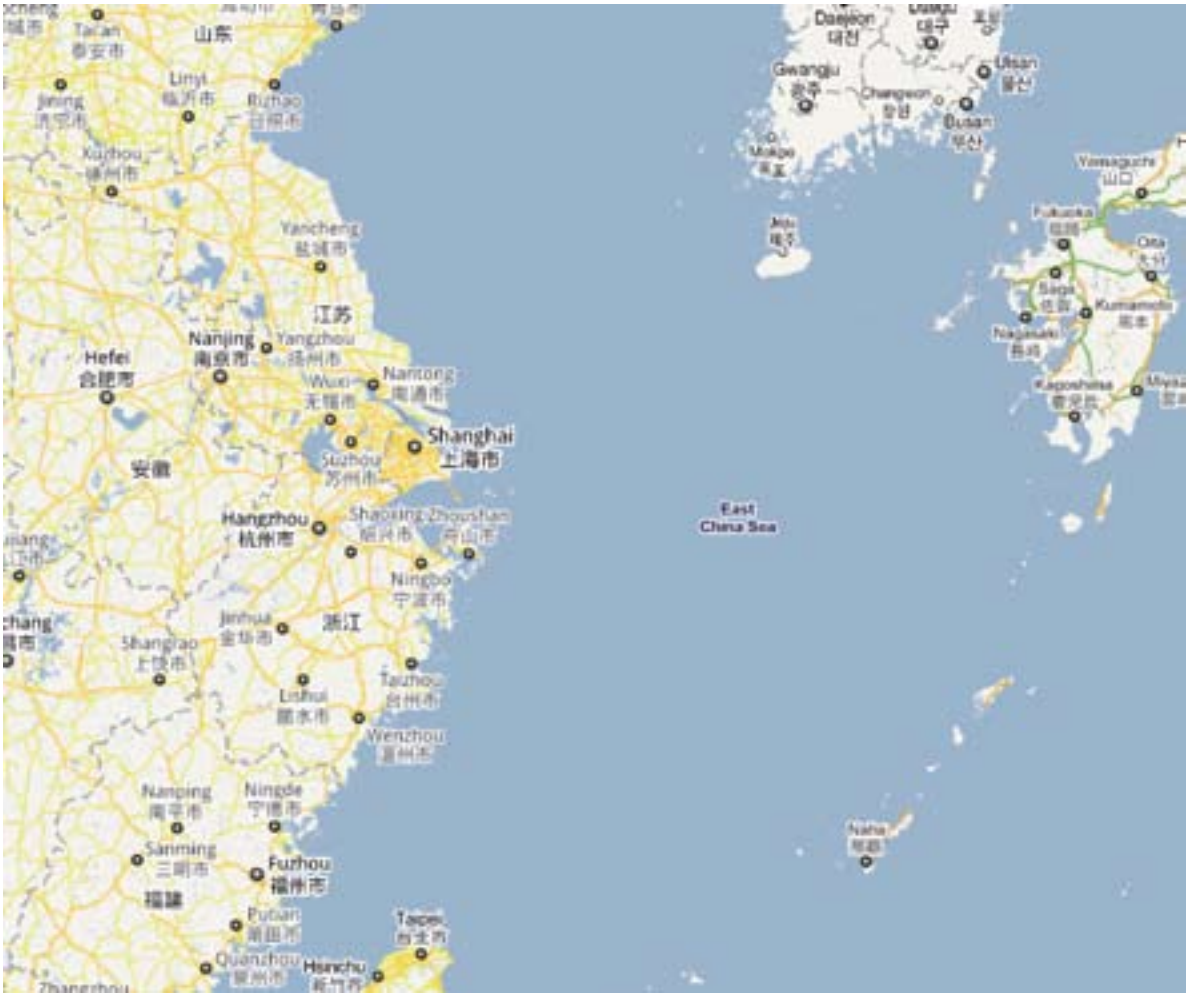
MV Alice
Area of operation: East China Sea
Sea passage: Taipei to Nagasaki

Port of Call #1: Taipei
ETA: 0800, 01-05-2011
Weather: …….
Loaded 16,000 mt of cargo
Finished loading: 2300
Problem with main engine cylinders
Contacted company about possible repair in next port of call
ETD: 2030, 03-05-2011

Port of Call #2: Shanghai
ETA: 1300, 06-05-2011
Were delayed due to heavy traffic in area
…….
…….
…….
…….
Time spent in port: …….. hours

Port of Call #3: Rizhao
ETA: 0700, 14-05-2011
Weather: …….
Discharged 10,000 mt cargo
Performed scheduled maintenance of lifeboats
…….
…….
ETD: 0900, 15-05-2011

Port of Call #4: Nagasaki
…….
…….
…….



b) Listen to a seafarer talking about an event that happened during a sea passage. Complete the information below.

Name of vessel:

Type of vessel:

Route:

Cargo:

Incident:

Area / position where incident happened:

Date when incident happened:

II. Deck log book entries

a) Look at the deck log book extract below. What is the event recorded in the log? Circle the correct event.

engine failure	discharging operation	anchoring	attempted pirate boarding

b) Fill in the gaps of the deck log book with the words in the box that follows.

Time	Log	Course	(1)_____	REMARKS
0000	6533	065	N 4	(2)_____, moderate breeze, moderate sea,
				good (3)_____ .
0020				(4)_____ New York Pilot Station. Stand by
				engine. End of sea (5)_____. Proceeded to
				take sea pilot as per NY Pilot Station instructions.
0040				Pilot (Mr. Sean Craig) (6)_____. We
				(7)_____ towards anchorage area.
0055				Reached the anchoring position. Engines stopped.
0100				(8)_____ port anchor 6 shackles.
0115				Pilot (9)_____. Finished with engines.

sailed	disembarked	approached	visibility	embarked
dropped	overcast	passage	wind	

c) These are log book entries reporting past incidents. Match the phrases to the appropriate incident.

~~made stability calculations~~	sounded fire alarm	activated flooding response team
stranded in shallow waters	oil leaked into the sea	released CO_2
jettisoned cargo	~~evacuated ER~~	regained stability
~~tank overflowed while transferring fuel~~	performed oil clearance	refloated vessel

LIST
- made stability calculations
-
-

GROUNDING
-
-
-

SEA POLLUTION
- tank overflowed while transferring fuel
-
-

FIRE IN THE ENGINE ROOM
-
- evacuated ER
-

d) Listen to the captain reporting an incident from a past voyage. Fill in the missing verbs in the deck logbook entries about the particular incident.

Time	Log	Course	Wind	REMARKS
1720	1022	245	NW 6-7	At this time, while sailing in position Lat 23°30'21" N
				Long 120°25'34" E we (1)_____ that the
				vessel was listing heavily to port. After measuring fuel
				tanks, fresh water tanks, ballast tanks and calculating
				vessel's stability it was established that the metacentric
				height of the vessel (GoM) was zero because the deck
				cargo had absorbed seawater. (2)_____ to
				jettison cargo.
1730				(3)_____ owners and charterers.
1745				Standby engine. Preparation for jettison of cargo.
1830				Commenced jettisoning in position Lat 23°42'21" N Long
				120°25'34" E.
1840				(4)_____ about 200 cubic meters of deck
				cargo (timber) and the vessel (5)_____
				positive stability.
1930				Completed jettisoning. Sailing normally.
2000				(6)_____ initial incident report and
				(7) _____ it to owners as per S.M.S.

e) Write a paragraph that describes a past voyage. Describe the following.

– The route – The weather
– The cargo – An incident

For help, you can use the notes in exercise (c) above, and choose one of the incidents mentioned there (sea pollution, grounding, fire in the ER). Also, you can use the Voyage Report (on page 213) as a model for your own paragraph.

3. Lights, shapes and sound signals[1]

A. *Definitions of terms. Match the terms in the box to the definitions below.*

Whistle	Flashing light	Prolonged blast	Masthead light	All-round light
Short blast	Restricted visibility	Sidelights	Sternlight	

	a) a light flashing at regular intervals at a frequency of 120 flashes or more per minute
	b) a blast of about one second's duration
	c) a white light placed as nearly as practicable at the stern showing an unbroken light (over an arc of the horizon of 135 degrees)
	d) any sound signalling appliance capable of producing the prescribed blasts
	e) a white light placed over the fore and aft centreline of the vessel showing an unbroken light (over an arc of the horizon of 225 degrees)
	f) a green light on the starboard side and a red light on the port side each showing an unbroken light (over an arc of the horizon of 112.5 degrees)
	g) a blast of four to six seconds' duration
	h) a light showing an unbroken light (over an arc of the horizon of 360 degrees)
	i) any condition in which visibility is restricted by fog, mist, falling snow, heavy rainstorms, sandstorms or any other similar causes

B. *Sound signals in restricted visibility. Study the following table. Then write the condition the vessel is in when it sounds the particular sound signals, according to the table.*

[Rule 35] In **restricted visibility**, a power-driven vessel...

making way through the water	shall sound	one prolonged blast at intervals of not more than 2 minutes
underway but stopped		two prolonged blasts in succession with an interval of about 2 seconds between them at intervals of not more than 2 minutes
not under command	shall sound	three blasts in succession, namely one prolonged followed by two short blasts at intervals of not more than 2 minutes
restricted in ability to manoeuvre		three blasts in succession, namely one prolonged followed by two short blasts at intervals of not more than 2 minutes

1. Source: International Regulations for Preventing Collisions at Sea, 1972, part C – Lights and shapes, part D – Sound and light signals.

VESSEL	SOUND SIGNAL
1.	——— • •
2.	——— • •
3.	——— ———
4.	———

C. ***Lights and Shapes. Study the selected relevant regulations in the table below and do exercises (a) and (b) that follow.***

[Rule 23] A power-driven **vessel underway** shall exhibit:

(i) a masthead light forward;
(ii) a second masthead light abaft of and higher than the forward one;
(iii) sidelights;
(iv) a sternlight.

[Rule 30] A **vessel at anchor** shall exhibit:

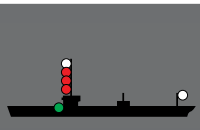
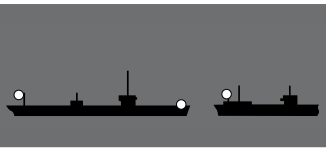
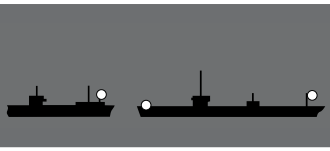
(i) an all-round white light or one ball in the fore part;
(ii) an all-round white light at the stern, at a lower level than the light prescribed at the fore part.

[Rule 28] A **vessel constrained by her draught** may, in addition to the lights prescribed for "vessel underway", exhibit three all-round red lights in a vertical line, or a cylinder.

[Rule 30] A **vessel aground** shall exhibit the lights prescribed for "vessel at anchor" and in addition

(i) two all-round red lights in a vertical line;
(ii) three balls in a vertical line.

a) Can you identify the following vessels? Look at the lights they are exhibiting and write the condition of each vessel in the first column.

VESSEL	PORT	STARBOARD	AHEAD
1.			
2.			
3.			

b) Match the vessels to the shapes they exhibit. Draw arrows.

VESSEL	SHAPE
AT ANCHOR	
AGROUND	
CONSTRAINED BY HER DRAFT	

Round-up

A. Vocabulary Consolidation Self-Assessment.

Tick ☑ what you can do. Cross ☒ what you still find hard to do in English.

- ☐ Use the past simple tense when describing past events
- ☐ Read log book entries
- ☐ Explain / understand events that occurred during a sea passage
- ☐ Describe past voyages based on information from log book entries, passage plans and sea charts
- ☐ Understant COLREG rules (on lights, shapes and sound signals).

B. Class Project.

- Talk about a particular sea passage which occurred during your training voyage: mention the duration, area of operation, ports of call, hours spent in each port and any events that took place.
- What log books are there on board? Make a list and read it to class with a brief description of the type of entries that are recorded on each log book.

C. Circle the correct alternative.

1. A person who hides on a vessel is called a **charterer / stowaway**.
2. A place outside a harbour where ships can lie at anchor is called a **roadstead / berth**.
3. To sail into a harbour and stay there is to **dock / strand**.
4. When something that is normally protected is no longer secure, there is an **innovation / a breach of security**.
5. To illegally seize a vessel while in transit and force it to go to a different destination is to **hijack / commence** it.

D. Complete the following sentences. Use one of these verbs in the past simple:

lose	go	enjoy	drink	stay
start	finish	stop	expect	put

1. We _____ out last night to a nice restaurant. I _____ a

lot of red wine, that's why I have a terrible headache this morning.
2. I _____ my keys yesterday. I can't remember where I _____ them.
3. The rock concert last night _____ at 22.00 and _____ at 23.00. Everybody in the audience were really disappointed because they_____ more.
4. I _____ my holidays last summer. We _____ at a very nice hotel.
5. The police _____ me on my way home last night.

E. Match to make collocations.

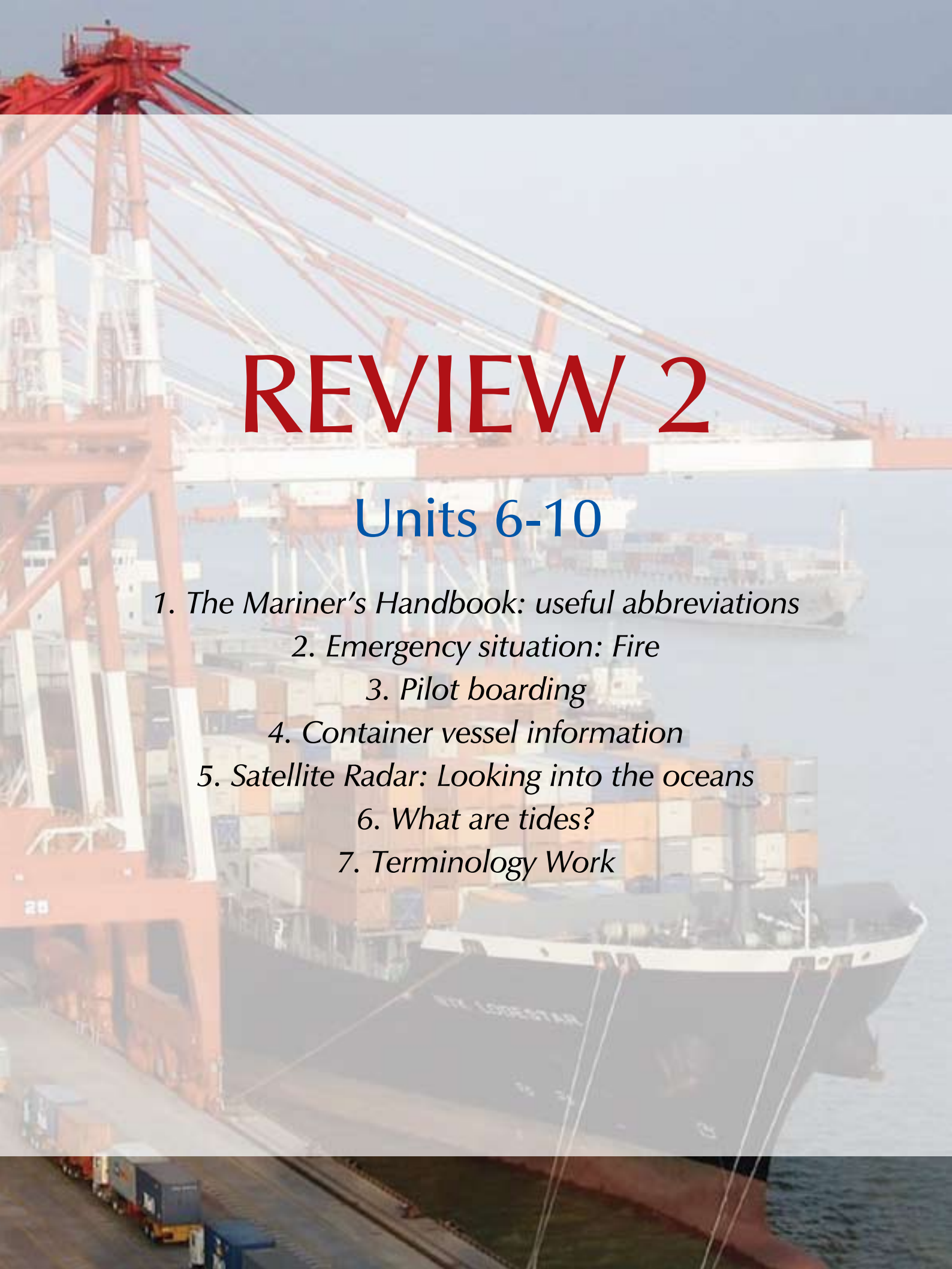
1. prolonged _____
2. restricted_____
3. flashing _____
4. shallow _____
5. heavy_____
6. incident_____
7. stability _____

waters
report
calculation
blast
light
traffic
visibility

F. Fill in the missing words. Use the words in the box.

entry	incident	malfunction	stowaways	call

1. Last night there was an attempted boarding _____. Two _____ tried to board the vessel, but they were noticed by a member of the crew.
2. The OOW detected a(n) _____ of the ship's radar. We are expecting technical assistance in the next port of _____ in order to fix the problem. Meanwhile, the OOW made a(n) _____ in the logbook.



REVIEW 2

Units 6-10

1. The Mariner's Handbook: useful abbreviations

2. Emergency situation: Fire

3. Pilot boarding

4. Container vessel information

5. Satellite Radar: Looking into the oceans

6. What are tides?

7. Terminology Work

1. The Mariner's Handbook[1]: useful abbreviations

A. Write the correct title for each group of abbreviations. Use the following words.

Rescue and distress	Times	Navigation
Vessels and cargo	Directions	Organizations

B. Fill in the missing words to complete the abbreviations. Some help is provided. Discuss them with your partner.

(1) _____

N		S	
NE		SW	

(2) _____

GPS		TSS	Traffic Scheme
	System	VTS	Traffic

Offshore Operations

SBM Single buoy mooring

(3) _____

IALA	International Association of Authorities	IMO	International

Radio

HF	High	VHF	high
Navtex	Navigational	WT	telegraphy

(4) _____

EPIRB	Emergency Indicating Beacon	MRCC	Maritime Co-ordination Centre
GMDSS	Global and System	SAR	and

Tides

HW	water	MLW	Mean water
LW	water	MSL	Mean sea level

1. Source: The Mariner's Handbook, NP 100, 7th ed.

(5) _____

ETA	Estimated time of	UTC	time
ETD	Estimated time of		

Units and Miscellaneous

°C	Celsius	Km	
dwt	tonnage	Kn	
feu	forty foot equivalent	m	metre(s)
gt	tonnage	mm	
hp	horse	teu	foot equivalent unit

(6) _____

LASH	aboard ship	POL	Petrol, & Lubricants
LNG	Liquefied	Ro-Ro	Roll-on,
LOA	overall	SS	Steamship
LPG	Liquefied Gas	ULCC	Ultra Large
MV	vessel	VLCC	Large

2. Emergency situation: Fire

A. Listen to a short lecture on fire and note down its outline in the space provided. The parts are given below. First decide on the three main parts of the lecture, then list the details in the correct place.

✸ **Fire** .....

- Fire-retarding bulkheads / decks
- .....
- .....
- .....
- .....

✸ **Fire** .....

- Cleanliness
- .....
- .....

✸ Fire detection

- .....
- .....

✸Fire prevention

✸~~Fire detection~~

✸Fire protection

- Fire alarms
- ~~Fire-retarding bulkheads / decks~~
- Fire patrols
- Means of escape
- ~~Cleanliness~~
- Proper ventilation
- Sprinklers
- Correct cargo stowage
- Portable and fixed extinguisher systems
- Fire drills

B. Fire: Emergency Checklist[2].

In pairs, say what you must do in case of a fire on board.

Student A: What must you do in case of fire on board? What are the actions to be carried out?

You must…

Student B: Tick the actions mentioned by your partner in the checklist. Ask him/her questions to help him/her mention as many actions as possible. Add any "other actions" s/he mentions at the bottom of the checklist.

C5 FIRE

Action to be carried out:

- ☐ Sound the fire alarm
- ☐ Call master if not already on bridge and notify engine room
- ☐ Muster crew
- ☐ Establish communications
- ☐ Check for missing and injured crew members
- ☐ On locating the fire, notify all on board of that location
- ☐ If an engine room fire, prepare for engine failure and manoeuvre ship away from danger

Assess fire and determine:

- ☐ The class of fire
- ☐ Appropriate extinguishing agent
- ☐ Appropriate method of attack
- ☐ How to prevent the spread of the fire
- ☐ The necessary personnel and firefighting methods
- ☐ Close down ventilation fans, skylights and all doors including fire and watertight doors
- ☐ Switch on deck lighting at night
- ☐ Make ship's position available to radio room/GMDSS station, satellite terminal or other automatic distress transmitters and update as necessary
- ☐ Inform Coastal State Authorities if appropriate
- ☐ Preserve VDR or S-VDR records if not automatically protected
- ☐ Broadcast DISTRESS ALERT and MESSAGE if the ship is in grave and imminent danger and immediate assistance is required, otherwise broadcast an URGENCY message to ships in the vicinity

Other actions:

- ☐
- ☐
- ☐
- ☐

3. Pilot boarding

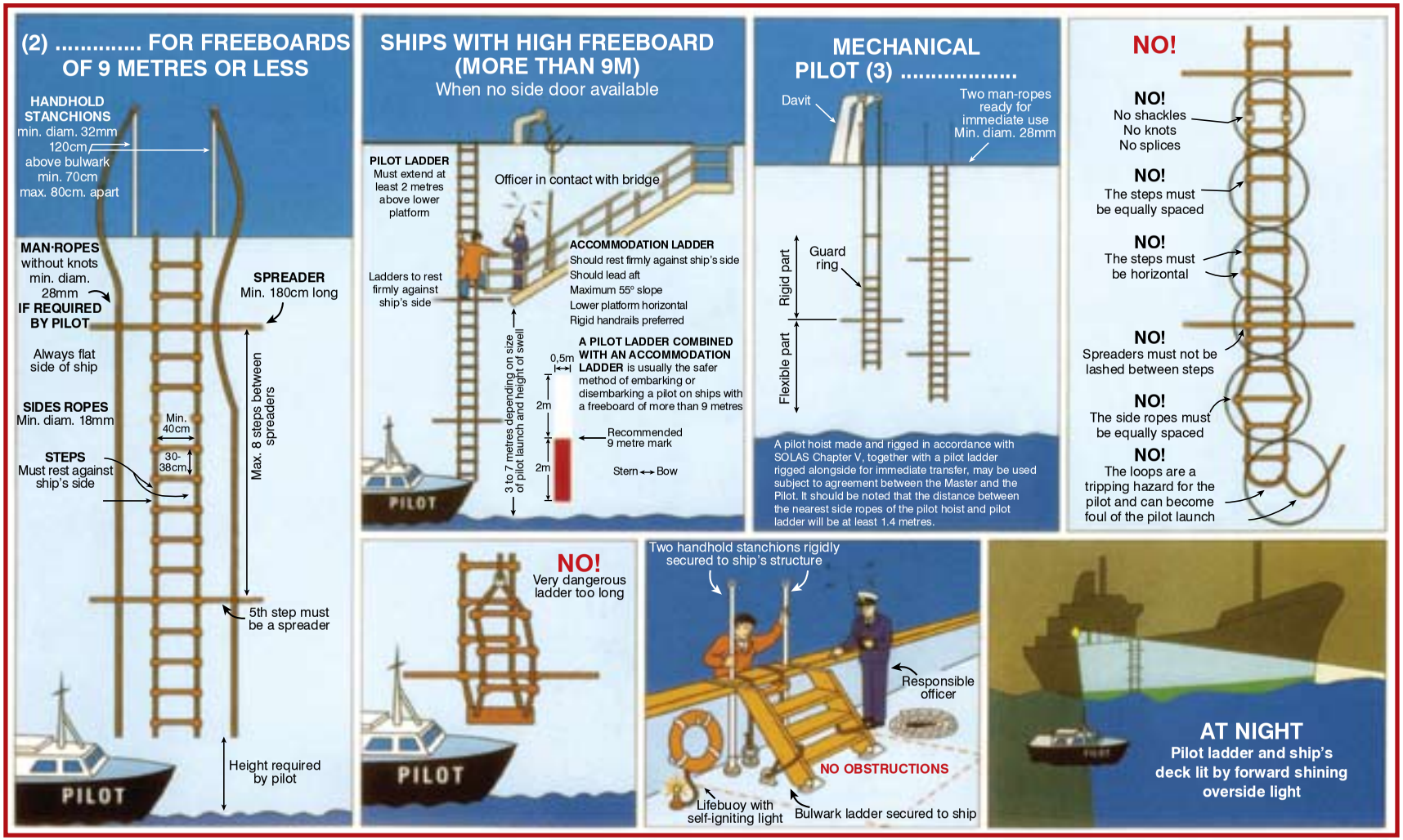
A. There are three gaps in the poster on the next page. Choose the right word for each gap from the following alternative words.

1. equipment / mechanism / arrangements
2. rigging / fixings / ropes
3. cable / ladder / hoist

2. C5 Fire, from Emergency Checklists, Bridge Procedures Guide, International Chamber of Shipping, 1998 & 2007.

REQUIRED BOARDING (1)..... FOR PILOT

In accordance with I.M.O. requirements and I.M.P.A. recommendations



B. Write the missing titles in the SHIP TO SHORE Master/Pilot Exchange table. Use the headings below – there is one extra heading you will not need to use.

SHIP PARTICULARS	PILOT BOARDING	SHIP IDENTITY
ADDITIONAL COMMUNICATION INFORMATION	MANOEUVRING DETAILS AT CURRENT CONDITION	LOCAL WEATHER AND SEA CONDITIONS

SHIP TO SHORE Master/Pilot Exchange

(1).....

Name | Call sign | Flag

Ship's agent | Year built | IMO No

Cargo type | Ship type | Last port

(2).....

Fax | Telex | Other

(3).....

Date/ETA (UTC/LT) | Freeboard

Boarding station (if there is more than one)

(4).....

Draught fwd | Draught aft | Draught amidships (salt water)

Air draught | Length | Beam

Displacement | Dwt | Gross | Net

ANCHORS

Port anchor | Stbd anchor (length of cable available)

(5).....

Full speed | Half speed

Slow speed | Min. steering speed

Propeller direction of turn left/right | Controllable pitch yes/no

Number of propellers | Number of fwd thrusters | Number of aft thrusters

MAIN ENGINE DETAILS

Type of engine motor/turbine/other

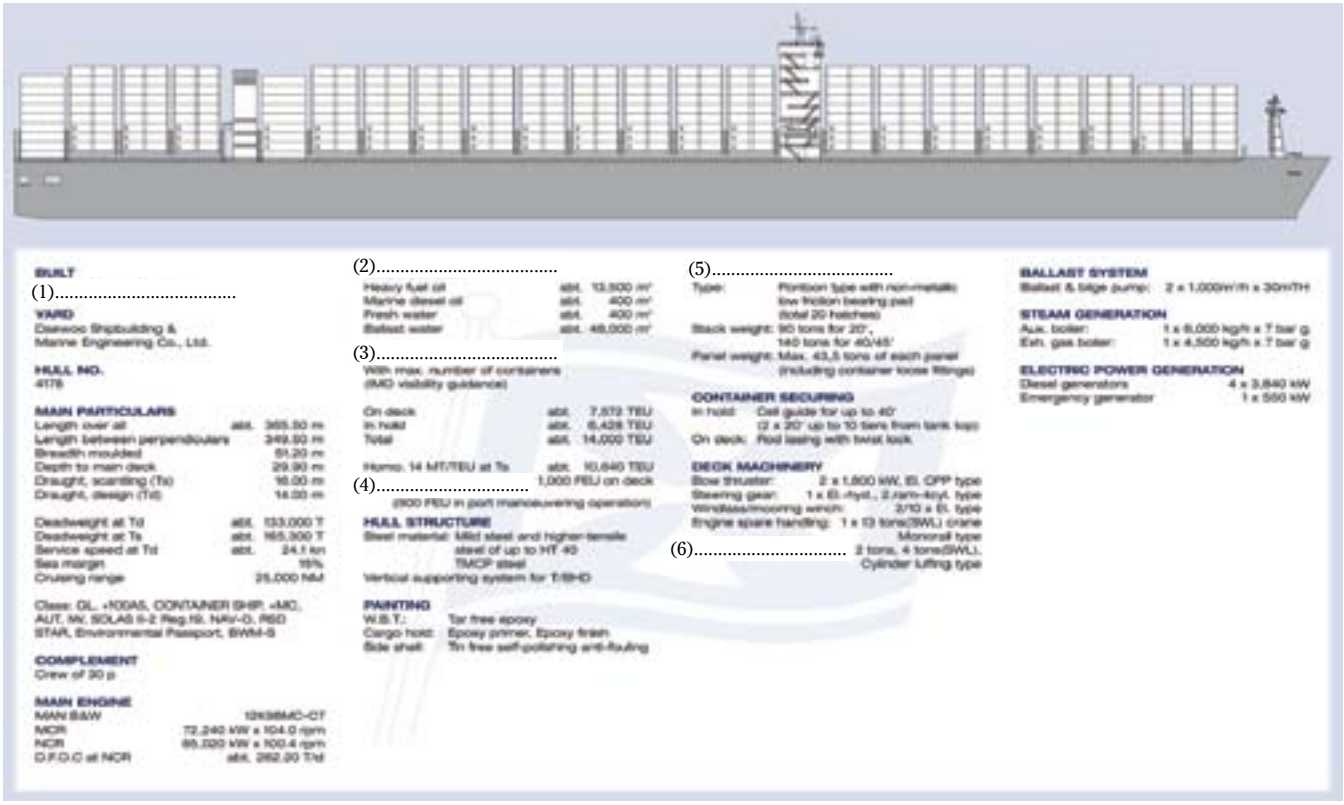
Max. number of engine starts | Time from full ahead to full astern

EQUIPMENT DEFECTS RELEVANT TO SAFE NAVIGATION

4. Container vessel information

– Fill in the numbered gaps in the Container Vessel Information. Use the phrases below (there is one extra phrase you will not need to use).

Provision crane	Tank capacity	Pumping capacity	Container capacity
Reefer container	2009 (14,000 TEU Class)	Cargo Hatch Cover	



5. Satellite Radar: Looking into the oceans

Lead-in:

- What is a satellite radar?
- What information does it provide?
- How does it work?

Satellite Radar: Looking into the oceans[3].

> The technology of satellite radar has revealed the entire climate engine of the planet, enabling vast weather systems to be detected, mapped, monitored and forecasted.

3. Looking into the Oceans; BBC One, Britain from Above Series.

– Listen and put the sentences in the correct order as they are mentioned. Write the appropriate number (1-5) in the boxes provided.

☐ With ocean imaging technology, scientists try to predict climate change for a time span of 10, 20, or even more years.
☐ The first series of radar satellite, called Poseidon, was the first to offer a glimpse of El Niño, and its catastrophic temperature shifts.
☐ The Satellite Radar can measure ocean currents from space, offering information on the circulation of water and heat transfer around the globe.
☐ The new series of radar satellites is called Jason.
☐ Global climate change is visible through the satellite, making apparent the melting of polar ice and the rising temperatures.

6. What are tides?

Do you know... – the difference between tides and currents?
– the difference between high tide and low tide?
– what causes tides?

A. What are tides?[4] Before you listen, check what you know. Choose the correct alternative.

1. Tides are the **horizontal / vertical** motion of water.
2. Tides are caused by **gravity / the wind**.
3. High tide is when the **crest / trough** of the wave reaches a particular location.

B. Listen to an interview with a scientist who studies tides and check if you guessed correctly. Then, fill in the missing words.

1. Water moving up and down during the day: _____
2. Water moving horizontally driven by wind, tides, etc.: _____
3. The gravitational pull of the _____ and the _____ causes tides.
4. If we know the tides we can better navigate through the _____ waterways and within the estuaries, _____ and harbours.

C. Match the words to their definitions.

trough
bay
estuary
crest

1. _____: the wide part of a river where it flows into the sea
2. _____: the top part of a wave
3. _____: a low area between two waves in the sea
4. _____: a part of the sea partly surrounded by a wide curve of the land

7. Terminology Work

A. What cargo handling operation is shown in the following picture? Describe it to class and decide on five key words, which you will write down in the space below. See if your classmates agree about the key words.

Key words: .....

4. NOAA podcast, April 8, 2009, Diving Deeper – What are tides?

B. Fill in the blanks with the following words (there are two extra words you do not need to use).

reefer	shipyard	gear	grab
flag	pipe	capacity	

M/V MAERSK BUFFALO is a container ship completed in 2007 in a German _____ and flies the _____ of Denmark. Its maximum TEU _____ is 4,300, and it can carry 1,400 TEU _____ containers. It has no handling _____ of its own.

C. Fill in the missing words.

relative	range	operation
switched	unreliable	manual

I will give you a briefing on status of navigational aids and equipment:

1. Port side / starboard radar is at 10 miles _____ scale.
2. The radar is _____ head-up.
3. GPS is not in _____.
4. The echo-sounder recordings are _____.
5. I changed to _____ steering at 12.00 hours UTC.
6. Navigation lights are _____ on.

D. Talk about one of the following pieces of equipment.

– What does it look like?
– How does it work?
– Why do we use it?

• Walkie-talkie	• VDR	• Gyro compass
• EPIRB	• Echo sounder	• Radar
• Gas monitor	• Breathing apparatus	

E. Fill in the gaps with words from the box. There is one extra word which you do not need to use.

proceed	bonded	inventory	capacity	attempt
resuscitation	traffic	spill	adjust	frozen

1. Do not _____ to extinguish the fire!
2. _____ to your muster stations immediately.
3. In an enclosed space rescue, the emergency party must begin _____ if the victim is not breathing at all.
4. Refrigerated containers carry fresh produce and _____ foods.
5. Every month the chief steward has a/an _____ of the food reserves onboard.
6. _____ stores, such as spirits and tobacco products, are subject to special tax.
7. The grain _____ of the vessel is 286,286 cft.
8. How do I _____ the range, sir?
9. The Master notified the authorities about the oil _____ in accordance with the Vessel's Response Plan.

F. Match the cargoes to the containers.

cotton	tomatoes	rum	guns
milk powder	toys	coal tar	vinegar

Cask; _____ Carton; _____ Drum; _____
Bale; _____ Bag; _____ Barrel; _____
Crate; _____ Case; _____

G. Which emergency situation must the following actions be carried out for? Fill them in under the appropriate situation.

Actions to be carried out:

- Hoist signal flag 'O'
- Release lifebuoy with light and smoke signal
- Identify location of incoming water
- Sound the general emergency alarm
- Sound three prolonged blasts of the ship's whistle
- Close watertight doors
- Commence a recovery manoeuvre, such as a Williamson turn
- Cut off all electrical power running through the area
- Post a lookout with binoculars

- Check bilge pump for operation
- Check auxiliary pumps for back-up operation
- Prepare rescue boat for possible launching

Flooding	Man overboard

H. Match the synonyms.

1. gear	..... kept at a refrigerated temperature
2. dairy products	..... equipment
3. chilled	..... to make better
4. to improve	..... to make easier
5. to facilitate	..... quick
6. rapid	..... milk, yoghurt, etc.

I. Match the phrases to make full sentences.

1. Is there risk of	☐ drifting into danger.
2. Do not overstow cartons	☐ free of smell?
3. MV Pioneer is	☐ grounding at low water?
4. Are bob-cats available	☐ replace them.
5. Are the holds	☐ straighten it.
6. The container lashings are damaged,	☐ keep sharp lookout and report to the On-Scene Co-ordinator.
7. The hold ladder is bent,	☐ with other goods.
8. All vessels in the vicinity,	☐ for trimming?

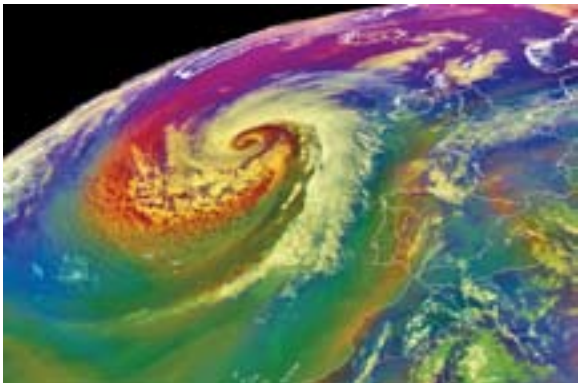
J. What is shown in each picture? Choose the statement that best describes the picture.

(a)

1. Plotting the course.
2. Writing a log book entry.

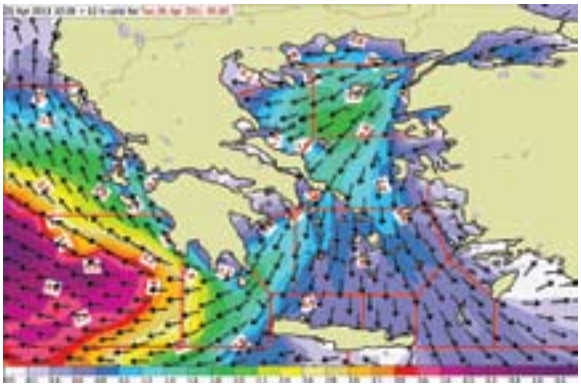
(b)

1. Stacking crane.
2. Floating crane.



(c)

1. Satellite map with tropical cyclone over North Atlantic.
2. Weather map with weather forecast for North Atlantic.



(d)

1. Wind forecast map: wind force and direction for Greece.
2. Wave forecast map: wave height and direction for Greece.

(e)

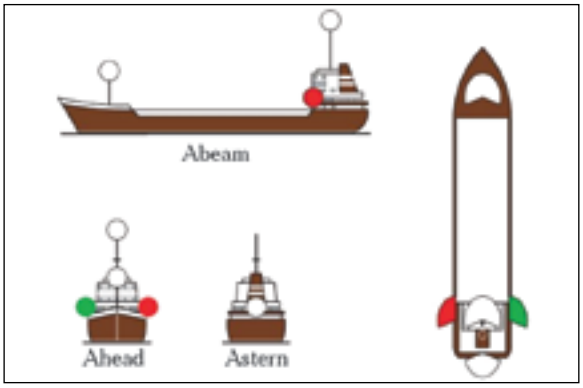
1. Sea spray created by large waves.
2. Floating ice around the vessel.

(f)

1. Extreme ice conditions, moderate visibility.
2. Following an icebreaker, poor visibility.

(g)

1. Pilot disembarkation in extreme ice conditions.
2. Towing in extreme ice conditions.



(h)

1. Power-driven vessel underway: Rule 23.
2. Anchored vessel: Rule 30.

(i)

1. Ships anchored at Singapore roadstead.
2. Ships docked at Singapore port.

(j)

1. Accommodation ladder on the ship's side.
2. Pilot ladder with spreader.

K. What is the appropriate message marker for each SMCP message?

1. _____ What is the atmospheric pressure in your position?
2. _____ The atmospheric pressure in my position is 990 millibars.
3. _____ I will enter fairway.
4. _____ Iceberg is located in sea area B7.
5. _____ The tide is rising.
6. _____ Wait until low water.
7. _____ I require icebreaker.
8. _____ (Advise you) Turn your vessel to windward.

L. Match the two halves to make full sentences.

1. The atmospheric pressure	..... is expected by 12.00 UTC.
2. An abnormal wave	..... is sufficient in your position.
3. Visibility	..... in my position is 1020 millibars.
4. The depth of water	..... is variable.

M. Fill in the gaps with the words in the box.

rough	charted	state	restricted	expected	navigation

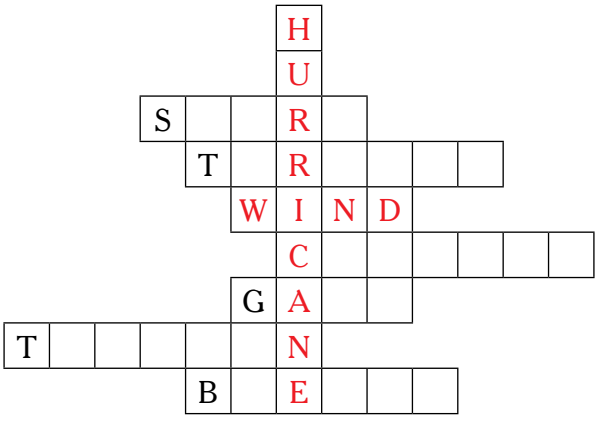
1. What is sea _____ in your position?
2. Sea is _____ in my position.
3. What is visibility in your position? Visibility is _____ by snow.
4. Is visibility _____ to change in my position?
5. _____ is dangerous in the area due to pack ice.
6. The _____ depth of water is decreased by 2 metres due to sea state.

N. Write the correct derivative of the words in brackets to complete the sentences.

1. The barometer is dropping _____ [rapid].
2. _____ low tides are expected in your position [abnormal].
3. Navigation in the area is only possible with icebreaker _____ [assist] or for high-powered vessels of strong _____ [construct].
4. The tide is 2 meters below _____ [predict].
5. Listen carefully to the safety _____ [instruct] which follow.

6. This is your captain with an important _____ [announce].
7. We will have an _____ [evacuate] and boat drill shortly.
8. _____ [provide] and drinking water in the lifeboats will be distributed by an officer.
9. You obtain medicine for _____ [seasick] from the lifeboatman.

O. Write up the types of wind; the first letter is given.



P. Fill in the missing words in the following passenger care announcements.

calm	obey	detect	address	leaflets	prolonged

1. In case of emergency, please _____ the orders given on the public _____ system.
2. Seven short blasts and one _____ blast will be given with the ship's whistle.
3. Remain _____ when you hear the general emergency alarm.
4. Read all notes and _____ concerning safety regulations.
5. If you _____ a fire or smell smoke call out "Fire"!

Q. Fill in the correct preposition.

in	for	on	on	of	off	with

1. Keep a sharp look-out _____ persons in the water.
2. Do not take _____ your head covering whatever the weather.
3. Keep your lifejackets _____.
4. We have radio contact _____ rescue craft.
5. Vessels _____ the vicinity have been informed _____ our situation.
6. There are enough life-saving appliances for everyone _____ board.

UNIT 11

Incidents And Accidents At Sea

1. *Reporting details of incidents at sea*
2. *The nature of various types of incidents at sea*
3. *Types of incidents*
4. *Marine Accident Reports*
5. *VHF communications for distress and urgency messages [SMCP A1/1.1.3-4, A1/2.1-2.2]*

Round-up

1. Reporting details of incidents at sea

– Story in the news

a) Listen to the news report as many times as you like. Then do exercises i - iii.

i. Can you answer the following questions?

- What was the accident?
- Where did it happen?
- Was there any damage?

ii. What is the correct title for the news report?

a) Collision causes traffic congestion in the North Sea.
b) Danger of environmental disaster due to leaking tanker in the North Sea.
c) A Greek tanker carrying jet fuel collided with a container ship in the North Sea.
d) Two crewmembers were injured in a collision in the North Sea.

iii. Fill in the Glossary with the words given in the box:

shipping lane	contain (a leak, a fire)	en route	spokesman (*gender neutral:* spokesperson)	congestion

Glossary

.....	a person who speaks on behalf of a group or an organization
.....	on the way; while travelling from/to a particular place
.....	a route used by ships on regular journeys
.....	the state of being crowded and full of traffic
.....	to prevent something harmful from spreading or getting worse

b) Read the two articles on the incident from two different sources and do exercises i – v that follow them.

(text from *Daily Mail*)

A tanker carrying jet fuel has collided with a container ship, causing fuel to briefly spill into the North Sea. The Cypriot vessel Jork Ranger tore a 20ft hole in the hull of the Greek tanker Mindoro around 20 miles off the Dutch coast at Scheveningen. Some highly inflammable kerosene leaked from a hole above the water line before the crew managed to pump the remaining fuel into an undamaged part of the ship.

Peter van Oorschot, a spokesman for the Dutch Coast Guard, confirmed that no one was hurt in the collision. Mr Oorschot said the jet fuel quickly vaporised and posed no public health risk, and it is not expected to reach the Dutch coast. He could not say how much jet fuel the 25-man tanker was carrying but added that the situation was under control. Offshore winds are blowing the slick away from the coast. The container ship has a crew of 12 and has asked permission to sail on to Rotterdam, its original destination after leaving St Petersburg.

(text from *www.shipwrecklog.com*)

The Greek tanker Mindoro collided with the Cypriot container vessel Jork Ranger near Scheveningen, Netherlands. The Mindoro was loaded with jet fuel which leaked from a hole above the waterline. The vessel was able to stop the leaking by pumping the fuel into an undamaged tank. The pollution released is not a severe risk as it is expected to evaporate. The Jork Ranger sailing from St. Petersburg continued towards Rotterdam. The Mindoro was heading for anchorage off Scheveningen. The reason for the collision has not been reported, but the weather was clear and waves were around 1 meter.

i. How did they stop the leak in the Mindoro?

ii. The *Daily Mail* published the following pictures of the accident. Match the pictures to the appropriate captions:

Heading for port: The damaged cargo ship Jork Ranger passes through River Maass watergate on its way to the harbour in Rotterdam, its original destination

Pollution: Kerosene is seen leaking from the punctured hull of the Mindoro

Collision: The damaged hull of the Greek tanker, Mindoro, after it hit the Jork Ranger container ship 20 miles off the Dutch coast

Hull damage: The exact spot (marked with a red circle) where the Cypriot container ship ripped a 20 ft hole in the Mindoro

Breach: The Mindoro loses jet fuel off the coast of Amsterdam

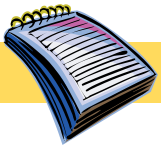
(a) 

(b) 

(c) 

(d) 

(e) 



Glossary

to puncture something	to make a small hole in something (e.g. to puncture a tyre)
breach	an opening, a tear (e.g. created by strong winds or sea)
to rip	to tear something, often suddenly or violently

Words that show violent movement, and can be used in case of grounding or collision:
[nouns] ***ingress of water, inflow of water, breach, hole, crack.***
[verbs] ***break through, crack open, puncture.***

iii. Vocabulary work. First match the words to their definitions. Then, use them to fill in the gaps. Change the form of the word if you need to (by adding an ending for example).

a) severe	_____ turn into gas
b) evaporate	_____ create a threat, problem, etc. that has to be dealt with
c) briefly	_____ extremely bad or serious
d) confirm	_____ an area of oil that is floating on the surface of the sea
e) pose	_____ state that something is definitely true
f) slick	_____ for a short time

1. I met him …….. on Tuesday night.
2. The lack of trained crewmembers ……. a threat to ship security.
3. The victim suffered …… injuries.
4. The 50 km ……. from the damaged tanker is visible from a distance.
5. Heat until all the water has ……..
6. She ……. that the rumors are true and offered to prove it with some evidence.

iv. Read the text on a marine accident and fill in the following missing verbs. Use the Past Simple.

start	lose	worsen	break off	drift

10/10/2008

M/V Fedra, a 35886 gt, 1984 built bulk carrier, ……..... ……..……. engine power and …… drifting toward the coast on the east side of Gibraltar.

Tugs deployed to the area but unfortunately the stormy weather ……..…. and the ship ……. stern first onto the cliffs just below the lighthouse at Europa Point and then swerved alongside the cliffs. The ship ……..…. in two and the crew was rescued after a dramatic helicopter rescue.

Fedra grounding in Gibraltar in 2008

Glossary

to deploy	to bring (forces or material) into action
to swerve	to change direction suddenly (especially in order to avoid hitting somebody or something)
cliff	a high area of rock with a very steep side, often at the edge of the sea or ocean

v. In pairs, ask and answer questions about the accident orally.

Note: *For information regarding Past Simple questions and negatives go to page 528.*

Student A:	*Student B:*
When did the accident happen?	The accident happened on 10th October 2008.
How……..?	……
Where…..…?	……
What …….. ? (weather)	It was……
……...any damage?	…….
….. anyone injured?	…….
How……. ? (the crew / rescue)	…….

2. The nature of various types of incidents at sea

I. Classification / Definitions

a) Fill in the gaps. Use the following words: serious / medical / disaster / results.

What is the meaning of "casualty"?

In the SMCPs "casualty" refers to a "case of death in an accident or shipping ……". In broader terms, and chiefly in insurance, "casualty" refers not only to *the person* injured or killed in an accident but more generally to *the accident* which involves …….. injury or loss of life.

"Marine casualty", for the United States Coast Guard for example, is defined as "any occurrence which …….. in damage by or to a vessel or its cargo, or injury which requires professional …… treatment beyond First Aid, or death".

b) Listen to how the IMO classifies incidents. Then, decide what each of the following incidents are classified as. Circle the correct classification.

there is fatality (death of crew-member)	**very serious casualty / serious casualty**

there is engine breakdown, the ship requires tug assistance	**very serious casualty / serious casualty**
there is ingress of water, the ship is unseaworthy	**very serious casualty / serious casualty**
there is total loss of the ship	**very serious casualty / serious casualty**

c) Fill in the missing verb or noun in the following table.

Verb	***Noun***
……	– classification
lose	– ……..
……	– immobilization
……	– towage

Verb	***Noun***
……..….	– pollution
assist	– ……
penetrate	– ……
……	– definition

d) Match the words to form correct collocations.

1. Total ……	of life
2. Loss ……	assistance
3. Weather ……	cracking
4. Hull ……	damage
5. Unfit ……	classification
6. Shore ……	to proceed
7. IMO ……	loss

e) We saw how casualties are distinguished into "very serious" and "serious". Below are some more useful definitions of terms. Write the correct term for each definition.

Near miss (hazardous incident)	Investigation
Marine accident	Marine incident

1. _____ means an abnormal event occurring in the course of operation of seagoing ships and likely to cause danger to man, ships or the environment.
2. _____ means one (or more than one) marine undesired incident which results in personal injury, damage or loss, including loss of life or major injury to any person on board, the actual or presumed loss of a ship, abandoning the ship, collision or grounding, the ship becoming disabled, and also material damage caused to a ship.
3. _____ is an accident that nearly occurs in connection with the operation of the ship.
4. _____ means the determination of conditions, circumstances, causes of marine accidents with a view to effective measures to prevent and limit similar accidents.

f) Read the information about an accident that happened in Singapore Strait on 25 May 2010 and fill in the report form.

Lead-in: Look at the following two pictures. What type of accident has happened?

INCIDENT DESCRIPTION

DATE:

LOCATION:

TYPE OF INCIDENT:

VESSELS INVOLVED:

#1	**#2**
NAME:	**NAME:**
IMO NUMBER:	**IMO NUMBER:**
FLAG:	**FLAG:**
TYPE:	**TYPE:**
CARGO:	**CARGO:**
BUILT:	**BUILT:**
DAMAGE SUFFERED:	**DAMAGE SUFFERED:**
CURRENT LOCATION:	**CURRENT LOCATION:**
☐ **REMAINING AT INCIDENT SITE**	☐ **REMAINING AT INCIDENT SITE**
☐ **ANCHORED AWAY FROM INCIDENT SITE**	☐ **ANCHORED AWAY FROM INCIDENT SITE**
☐ **MOVED TO DRY DOCK FOR REPAIRS**	☐ **MOVED TO DRY DOCK FOR REPAIRS**

INCIDENT SEVERITY RATING: (circle as appropriate)

INJURIES: YES / NO

POLLUTION: YES / NO

OIL-SPILL RESPONSE: YES / NO

(IMO classification) VERY SERIOUS CASUALTY / SERIOUS CASUALTY

Collision in Singapore Strait

- An oil tanker and a bulk carrier collided in waters between Malaysia and Singapore, spilling an estimated 2,500 tonnes of oil, but traffic in Asia's busiest shipping lane was not affected.
- The Malaysian flagged Aframax class M/T Bunga Kelana 3 [IMO 9178331, built in 1998, DWT 105784] was carrying about 62,000 tonnes of light crude oil. The collision occurred between the tanker and the MV Waily, a bulk carrier registered in St Vincent and the Grenadines [IMO 8221478, built in 1983, DWT 25449], which suffered minor damage. The collision caused a 10-metre gash on the port side of the tanker, the coast guard said. Both vessels are currently anchored away from the incident's site. There were no reports of injuries among the 50 crew members.
- Singapore port authorities said the spill measured about four kilometres by one kilometre and was located six kilometres south of Singapore's south eastern tip at 2:20 pm local time. Singapore and Malaysia activated oil-spill response companies and a clean-up operation involving 20 craft.
- The incident happened in the Traffic Separation Scheme (TSS) of the Singapore Strait, 13 kilometres from the tip of the island nation. Singapore, the world's largest bunkering port and Asia's top oil-trading hub, lies at the south eastern end of the waterway.

II. Key vocabulary from report forms

The following exercises use samples of phrases from incident reports; they include common/useful instructions, questions, headings, etc[1].

involve *How many vessels were **involved** in the collision?* *Was any hazardous material released or **involved**?* *The incident **involves**…* • If a situation, an event, etc. involves somebody or something, they take part in it or are affected by it.	***damage*** *The fire **damaged** the E/R.* • to damage, to cause damage • serious / severe / extensive / permanent / minor damage • fire / storm / weather damage
occur *When did the accident **occur**?* *What is the date of **occurrence**?* • occur: happen, take place	***fail*** *The diesel generator **failed**.* *There is engine **failure**.* • fail (of machinery): to stop working
affect *Did the incident **affect** the ship's stability?* • affect: to produce a change in somebody or something	***location*** • the site, area, position, location, scene … of the accident
cause *Do they know what **caused** the fire?* • cause (something): to make something happen, esp. something bad or unpleasant	***accident*** • a serious / minor / fatal accident [expressions: to "have an accident", "by accident": not deliberately]

1. The phrases come from: "Marine Incident Report" (Australian Maritime Safety Authority), "Report of Marine Accident, Injury of Death" (U.S. Coast Guard) and "Report on Accident at Sea" (Swedish Transport Agency).

a) The following are questions regarding "manning on the bridge at/before a collision / grounding". Match the two halves and write them in the space provided.

1. Who was	➜	the radar no 1?	Who was on the bridge?
2. Where was	➜	the look-outs?	_____
3. Who operated	➜	the master?	_____
4. Where were	➜	~~on the bridge~~?	_____
5. Who was	➜	at the helm?	_____

b) Write questions with "was there...?" or "were there...?"

1. ..... a pilot on board?
2. ..... any witnesses?
3. ..... any damage?
4. ..... any injuries?
5. ..... any spill?

c) The following questions come under the heading "Manning". Write the appropriate question that finishes each sentence.

who was on duty?	who was at the helm?	who operated it?
who supervised it?	~~who was on watch~~?	

1. At manual steering, ...?
2. At manned engine room, ... who was on watch.....?
3. At unattended engine room, ...?
4. At use of automatic pilot, ...?
5. At manoeuvring of the main engine from the bridge, ...?

Make sure you know the following verbs.

- ***determine:*** to discover the facts about something, to establish, *e.g. We must determine exactly what happened that night.*
- ***recommend:*** to advise a particular course of action, *e.g. The manager recommended a 10% increase.*
- ***complete:*** to write all the information you are asked for on a form, fill in / out, *e.g. 1000 people completed the questionnaire.*
- ***collect:*** to bring things together from different people or places, to gather, *e.g. to collect data, evidence, information.*
- ***state:*** to formally write or say something, especially in a careful and clear way, *e.g. The facts are clearly stated in the report.*

d) Complete the gaps with the appropriate phrases.

determine	preventive actions
recommend	who was involved
complete	all necessary data
collect	the form as soon as possible
state ..... the cause of the accident..	~~the cause of the accident~~

e) Look at the following instructions and write what questions must be asked.

Describe how accident occurred, damage, information on alcohol/drug involvement, witnesses.

How did……..… ……..…..…?	Was there… ……?	Was the person under the influence of ……..…..?	Were there …... .....?

f) First match the phrases, then write them up in the first column and fill in the second column with the correct information.

1. Name of person…	….. of oil spill
2. Date of…	….. in charge
3. Estimated damage…	….. where bound
4. Hazardous material…	….. occurrence
5. Estimated amount…	….. released
6. Last port…	..3.. to cargo

~~Extensive damage, cargo spoilt~~ / Jefferson / Noxious gas / Rotterdam / 31-12-2011 / 1,300 MT

1.	
2.	
3. Estimated damage to cargo:	Extensive damage, cargo spoilt
4.	
5.	
6.	

g) Write the missing derivatives.

Verb	***Noun***
explain	
	description
	witness
recommend	

Verb	***Noun***
fail	
	damage
involve	
occur	

h) Match the two halves to make full phrases.

1. the cause ……	involvement
2. alcohol ……	of the accident
3. action taken to prevent ……	narrative
4. recommendations ……	similar occurrences
5. incident ……	for corrective safety measures

3. Types of incidents

Read about the following incident reported by IMO in "Lessons Learned for Presentation to Seafarers" and do the vocabulary exercises that follow.

CONTACT

What happened?

In good weather, a ro-ro ferry had turned and the master was backing the ship into the link-span. As he did so, the starboard controllable pitch propeller (CPP) alarm was activated, but this went unnoticed. The master moved both CPP controls to take the way off, but the starboard CPP did not respond and continued to drive astern. The asymmetric thrust caused the stern to sheer to port, initially making contact with the pile fenders on the port side. Six minutes after the original alarm sounded, the master regained control of the starboard CPP at the centerline console, but not early enough to prevent the vessel making heavy contact with the link-span. The vessel suffered damage to the shell plating and the stern ramp was blocked by bent steel. Ashore, damage occurred to the pile fender and the loading ramp of the link span.

Why did it happen?

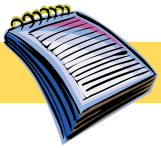
- The CPP failure alarm was heard on the bridge, but the bridge team could not identify which alarm was sounding.
- The engine-room staff saw the alarm had activated and had not been reset, but did not contact the bridge to check that they were taking action.
- The bridge team was not familiar with the propulsion system's emergency procedures and time was lost while they determined the appropriate action.
- The bridge CPP alarm only sounded briefly and the flashing light on the panel reverted to steady illumination after a short time. Therefore, the audio and visual triggers as to which alarm was activating were too transient.
- Despite intensive investigations, the cause of the CPP failure was not found.

What can we learn?

- The value of continually monitoring engine control feedback indicators.
- The value of understanding all alarm indicators prior to an emergency situation

Pier pile fender

Link span with loading ramp



Glossary

sheer	to change direction suddenly, to make a sudden movement to change course
revert to	to return to a former condition, go back to
transient	continuing for only a short time
intensive	extremely thorough, done with a lot of care

A. ***Supply the correct title to the following incidents, reported by the IMO in "Lessons Learned for Presentation to Seafarers". Choose from the titles below.***

SINKING / NEAR MISS GROUNDING / HEAVY WEATHER DAMAGE-FLOODING / MACHINERY FAILURE-ADRIFT / MACHINERY FAILURE-EXPLOSION

(1)……

What happened?

A ship nearly ran aground when it was being navigated in pilotage waters with its auto-pilot in "automatic track keeping mode". The ship was equipped with a sophisticated integrated bridge system which allowed the auto-pilot to make course alterations at programmed way-points. The system failed to initiate a course change, and when the ship was very close to running aground, the master engaged manual steering and turned the ship sharply to avert the grounding.

(2)……

What happened?

A single-hold general cargo vessel with a cargo of clay and manganese was en route to its next destination when the weather deteriorated and the winds became south-westerly at Beaufort force 10. A trim by the head was observed and an inspection of the cargo hold revealed the presence of water; however, the location of water ingress could not be determined. Pumps were deployed, but were unable to stem the vessel's increasing draft. The vessel was abandoned and it later sank.

(3)……

What happened?

The second engineer was in the engine-room carrying out some maintenance jobs when he noticed that the main engine's turbo charger was over speeding at a dangerous rate. Before he could reach the control room to shut down the main engine, the turbo charger exploded. This was the second turbo charger explosion in four months, but no one was injured.

(4)……

What happened?

The 1972-built bulk carrier was intentionally grounded by its master after the ship took water into cargo holds Nos. 6 and 7 during cyclonic weather and seas. The water could not be removed by either the ship's fixed pumps or portable pumps lowered into the holds. All crew members were safely evacuated from the ship after the grounding.

(5)……

What happened?
A four-engine twin-screw passenger vessel left port with all four engines running but lost propulsion power some thirty minutes later and drifted dangerously close to land. The engines stopped because of the loss of water in the main engine cooling system and consequent overheating. There was considerable delay in restarting the main engines because of loss of air pressure from the air start system. The air compressor had to be shut down as the engineers prepared to restore propulsion power.

B. *Vocabulary work. Match.*

1. Regain ……	an alarm
2. Suffer ……	pumps
3. Reset ……	contact
4. Deploy ……	vessel
5. Abandon ……	control
6. Make ……	damage

C. *Write up the sentences. Choose the correct phrase from those in brackets and use the Past Simple.*

1. The problem ……	(not respond)
2. The CPP ……	(deteriorate)
3. The weather ……	(reveal a system failure)
4. A crew member …… activated the alarm ……	(go unnoticed)
5. An inspection ……	(~~activate the alarm~~)

D. *Listen to three news stories about the same marine accident. Then do exercises i and ii.*

i. Choose the correct title for each news commentary. Put the correct number (1, 2 or 3) in the boxes.

☐ Containers removed from stricken ship
☐ Cargo ship threatens environmental disaster
☐ Bad weather halts cargo ship salvage

ii. Take notes about the accident. Use the following headings:

Type of Incident:
Location:
Vessel name: Rena
Vessel type:
Pollution:
Oil-spill Response / Salvage Operation:

Expand your notes from the previous exercise and write a paragraph reporting the accident.

What happened?

M/V Rena .....
.....
.....
.....
.....
.....
.....
.....
.....

4. Marine Accident Reports

A. *Read the following report summary and choose the correct alternative of the verbs in italics.*

Marine Accident Report: Pearl of Scandinavia Fire, 17 November 2010[2].

The PEARL OF SCANDINAVIA departed from Oslo on November 16 2010 at 17:30 on a voyage to Copenhagen. At 05:58 a fire alarm ***indicated / recommended*** fire on the car deck and it was established that some cars and trailers were on fire in two sections on the car deck aft on the port side. The fire was ***switched off / extinguished*** by the ship's sprinkler systems and subsequently by the ship's fire-fighting teams assisted by Swedish fire-fighters who had been flown to the ship by helicopter. The cause of the fire was an electric car that was being charged during the voyage. After having recognized the fire, all passengers were ***abandoned / evacuated*** to safe areas in the ship. Neither the passengers nor the crew were ***injured / damaged***. The PEARL OF SCANDINAVIA arrived in Copenhagen on 17 November 2010 at 12:15 by its own power.

B. *Choose the appropriate factual information to fill in the table.*

Accident data

Type of accident	
Time and date of the accident	
Position of the accident	

2. The casualty report was issued on 02 August 2011 and is available from the webpage of the Danish Maritime Accident Investigation Board, www.dmaib.dk

Area of accident	
Injured persons	
IMO Casualty Class	

Navigation data

Stage of navigation	

Ship data

Name	
Flag state	
Construction year	
Type of ship	
Tonnage	
Classification	
Engine power	

- En route from Oslo to Copenhagen
- Serious
- Ro-Ro passenger ship
- Fire
- Det Norske Veritas
- 05:58 local time on 17 November 2010
- None
- Denmark
- 56° 23′5 N - 012° 19′8 E
- 23,760 kW
- 40,039 GT
- 1989
- Pearl of Scandinavia
- 6 nm NW of Kullen, Sweden

C. ***The following information comes from the "incident narrative" part of the formal report. Write the correct question for each piece of information. First, put the words in the correct order to make full questions. Then match them to the correct answer below and write them in the space provided.***

a) the crew / how / guide / did / on board / to safe areas / passengers?
b) of the electric car / what / the brand / was?
c) the fire / where / break out / did?
d) there / was / damage / any?
e) start / the evacuation / did / when / of the passengers?
f) the fire-fighting teams / into / go / when / action / did?

1. ……?

The car was originally a conventional Nissan Qashqai with a combustion engine, but had been rebuilt by the owner to be powered by electricity.

2. ..... ?

The scene of the fire was deck 3, the car deck; the car deck is divided into sections by flooding control doors.

3. ..... ?

The first fire-fighting team was ready for action at 06:14 and during the following minutes a total of 4 teams were ready to go in action.

4. ..... ?

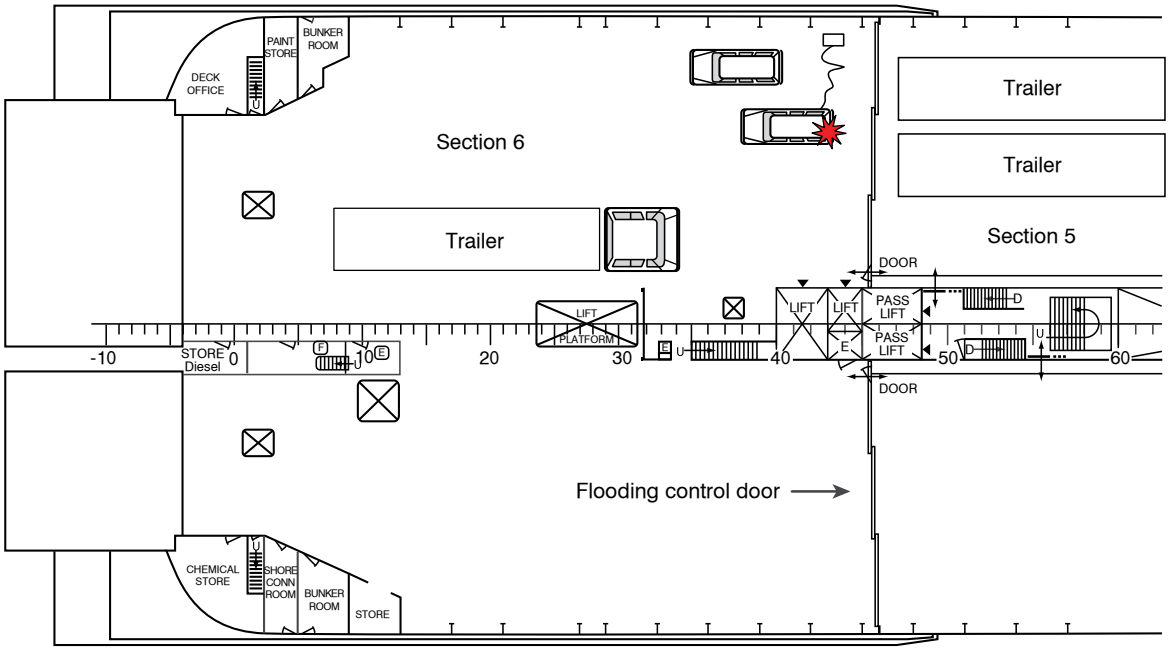
The evacuation of the passengers started immediately after the general alarm was sounded at 06:05.

5. ..... ?

Evacuation groups guided the passengers to designated restaurants. Guides were posted at all staircases to make sure that no passengers moved down the stairs or towards the aft part of the ship where there was fire and smoke.

6. ..... ?

Besides the electric car, three trailers and a car aft caught fire. Also, although the fire was extinguished effectively, it caused damage to the car deck resulting in the ship being taken out of service for some days.



The car deck aft showing where the electric car was parked

D. *Use all the information provided to answer the following questions.*

– Where did the fire start?
– What was the cause of the ignition?
– What type of extinguishing equipment was used (fixed or portable)?
– Did the extinguishing equipment function satisfactorily?

5. VHF communications for distress and urgency messages [SMCP A1/1.1.3-4, A1/2.1-2.2]

I. SMCP for distress communications regarding collision and grounding

a) Put the sentences in the correct order under the correct heading to recreate two exchanges between the distress traffic control station and a vessel in distress.

- I require tug assistance.
- What part of your vessel is aground?
- I cannot establish which part is aground. I will jettison cargo to refloat.
- When do you expect to refloat?
- Report damage.
- What kind of assistance is required?
- MV Maniana, position 20° 32' N, 040° 15' W. I am aground.
- I have damage below waterline.
- I expect to refloat when draught decreases.
- MV Alegro, position 15° 34' N, 061° 20' W. I have collided with unknown vessel.

Collision	***Grounding***
VESSEL:	*VESSEL:* .....
VTS:	*VTS:* .....
VESSEL:	*VESSEL:* .....
VTS:	*VTS:* .....
VESSEL:	*VESSEL:* .....

b) Match the terms to their definitions.

IMO class cargo	to proceed	to beach
Not Under Command	to jettison (cargo)	to refloat

1. ..... : to run a vessel up on a beach to prevent its sinking in deep water.
2. ..... : to pull a vessel off after grounding; to set afloat again.
3. ..... : to continue with the voyage.
4. ..... : to throw goods overboard in order to lighten the vessel or improve its stability in case of an emergency.
5. ..... : vessel which through exceptional circumstances is unable to manoeuvre as required by the COLREGs.
6. ..... : group of dangerous or hazardous goods, harmful substances or marine pollutants in sea transport as classified in the International Maritime Dangerous Goods Code (IMDG Code).

c) Choose the correct alternative from the words in bold in the following SMCPs.

1. MV Fedra, in position 15° 34' N, 061° 20' W. I am aground.
   What part of your vessel is aground?

Aground ***full / all*** length.

Can you repair damage by your own ***way / means***?

I can repair damage.

When do you expect to ***heave up / refloat***?

I expect to ***heave up / refloat*** when weather improves.

What kind of ***assistance / help*** is required?

I require ***guide / escort***. I can only ***advance / proceed*** at slow speed.

2. I have stability problems. I will ***jettison / capsize*** cargo to ***recover / regain*** stability.
   WARNING. Do not ***jettison / capsize*** IMO class cargo!

3. Can I ***beach / ground*** in position 16° 35' N, 060° 22' W?
   WARNING. ***Unknown / uncharted*** rocks around your position.

II. SMCP for urgency communications regarding engines / equipment and cargo problems

a) Put the sentences in the correct order under the correct heading to recreate two urgency traffic exchanges between the traffic control station and the calling vessel.

Cargo	***Technical failure***
VESSEL: ……	*VESSEL:* ……
VTS: ……	*VTS:* ……
VESSEL: ……	*VESSEL:* ……
VTS: ……	*VTS:* ……
VESSEL: ……	*VESSEL:* ……

- Can you stop spillage?
- Yes, danger of pollution.
- I have problems with propeller.
- No, I cannot stop spillage.
- I am manoeuvring with difficulty.
- I am spilling crude oil in position 15° 35' N, 060° 20' W.
- I am trying to proceed without assistance.
- Is there danger of pollution?
- Can you proceed without assistance?
- What problems do you have?

b) Join the two parts to make full sentences.

1. Stand by	…of radiation
2. MV Prime is dangerous source.....	…with caution
3. Keep clear	…on VHF channel 16
4. Navigate.....	…of IMO class A
5. I am spilling dangerous goods	…of MV Nero

Round-up

A. Vocabulary Consolidation Self-Assessment.

Tick ☑ what you can do. Cross ☒ what you still find hard to do in English.

- ☐ Understand formal reports of accidents
- ☐ Fill in incident reports
- ☐ Name various types of incidents
- ☐ Use SMCP for collision and grounding

B. Class Project.

- Look at ***www.imo.org*** *[Maritime Safety ⇨ Casualties]* to find out more on the procedure required by IMO to report a marine incident. What is the GISIS (Global Integrated Shipping Information System) and why are data on Maritime Incidents entered into it? What is the service entitled "Lessons Learned for Presentation to Seafarers"?
- Look up the fire accident on the car ferry Lisco Gloria (Oct. 9, 2010), an accident similar to but more serious than that on board the Pearl of Scandinavia. Present to class what happened. Did other Ro-Ro ferries have similar fire accidents on board?

C. Choose the correct alternative.

1. It was a *close / near* miss grounding.
2. It was a *close / near* quarters situation between a passenger ship and a tanker.
3. You must *determine / decide* the location of the fire.
4. CPP malfunction led to *contact / collision* with the dock.
5. There was cargo hold flooding and subsequent *decease / loss* of vessel.
6. Our original *destination / path* was Singapore, but there was a change of plans and we are now heading for India.
7. There is heavy traffic *congestion / blocking* in the area.
8. A police *spokesperson / speaker* announced the arrest of the arsonist.
9. The company *sustained / affected* losses of millions of dollars.

D. Write up the missing words. The first and the last letters are given.

1. We were en r _ _ _ e from Brazil to Rotterdam when the accident happened.
2. To c _ _ _ _ _ n a leak you must use booms.
3. The Singapore strait is a busy shipping l _ _ e.
4. After i _ _ _ _ _ _ _ e investigation they found the cause of the accident.

E. Vocabulary work. Match the words to their synonyms/definitions.

1. Incident	_____ fit to travel by sea
2. Fatality	_____ male or female
3. Unintentional	_____ to get
4. Gender	_____ to give
5. Seaworthy	_____ an occurrence, something that happened
6. Intentional	_____ deliberate, on purpose
7. Render	_____ number of deceased (dead)
8. Receive	_____ by accident, not on purpose

F. Fill in the words in the gaps.

licence	obstruction	issuing	expiry	submerged

1. In a document like a passport or an id card you can find information about the _____ authority and the _____ date.
2. After you graduate from university, the working _____, or working permit, allows you to be a professional teacher.
3. The vessel capsized but it did not sink, only a part of the hull was _____ into water.
4. You would be surprised at how often a vessel's superstructure collides with an overhead _____, such as a bridge. It sounds like a strange accident but it is actually quite frequent.

G. Which of the sentences are correct [☑] ***and which are not*** [☒]***? Correct the mistakes.***

1. I played backgammon with the captain yesterday but I didn't won. ☐
2. They went to a new restaurant near the port but they didn't enjoyed the food. ☐
3. We didn't do much work on deck yesterday. The weather was very windy. ☐
4. What did you at the weekend? I didn't anything special. ☐

H. Complete the sentences. Put the verbs into the correct past form, positive or negative.

1. There were many seagulls in the sky and one bird …… into the funnel. (fly)
2. The air ticket wasn't expensive. It …… very much. (cost)
3. I was in a hurry, so I …… enough time to phone you. (have)
4. It was hard work carrying the paint containers. They …… very heavy. (be)
5. I knew the Chief Engineer was very busy, so I …… him. (disturb)
6. I was very tired, so I …… to bed early. (go)
7. The bed was very uncomfortable. I …… very well. (sleep)
8. The food looked delicious but I wasn't hungry, so I …… anything. (eat)
9. It was a funny situation but nobody …… (laugh)
10. I couldn't afford to keep my car, so I …… it. (sell)
11. An A/B …… (fall) down the ladder and …… (break) his leg yesterday morning.

UNIT 12

I Require Medical Assistance

1. *Personal Injury*
2. *First Aid*
3. *Personal Protective Equipment*
4. *Occupational Accidents*
5. *SMCP: Occupational Safety [B2/2] / Requesting Medical Assistance [A1/1.3]*

Round-up

1. Personal Injury

I. Types of injury / Parts of the body

a) Look at the two pictures and answer the following questions.

- What type of accident can you see?
- What is the cause of the accident?
- How can it be prevented?
- What is the proper way of rigging the accommodation ladder?

b) An injured seafarer is talking to the medical officer. Listen to the dialogue and fill in the PERSONAL INJURY form below[1].

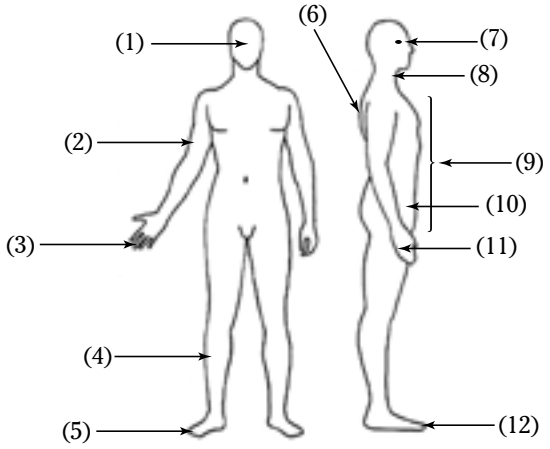
PERSONAL INJURY

Affected area			
☐ Head	☐ Eyes	☐ Trunk	☐ Arms
☐ Hands	☐ Legs	☐ Internal	☐ Back
☐ Neck	☐ Fingers	☐ Feet	☐ Toes
☐ Other (specify)			
Type of injury			
☐ Drowning	☐ Crushing	☐ Laceration	
☐ Burns & scalds	☐ Hernia	☐ Fracture	
☐ Electric shock	☐ Amputation	☐ Foreign body	
☐ Abrasion	☐ Bruising	☐ Asphyxia	

1. The form is an extract of the Marine Accident Report Form by AMSA (Australian Maritime Safety Authority).

☐ Strain & sprain	☐ None	
☐ Other (specify)		
Results of Incident		
☐ Death	☐ Serious injury	☐ Minor injury
☐ Near miss	☐ Temporary disability	☐ Partial disability
☐ Permanent disability	☐ Disappearance	☐ Time off work
☐ None	☐ Other (specify)	
First aid provided:		
Action(s) taken:		

c) Look at the part of the form above entitled "affected area". Show the parts of the human body mentioned there in the picture below. Write the names of the respective parts as they are shown by the arrows.



d) Make sure you understand the* type of injury *part of the accident form. Use the words from that list and fill in the appropriate type of injury next to each description / definition below.

1.	to injure a joint in your body, especially your wrist or ankle, by suddenly twisting it
2.	a break in a bone
3.	an object that has entered something (e.g. the eye) by accident and should not be there
4.	an injury to a part of your body, such as a muscle, that is caused by using it too much or by twisting it
5.	the state of being unable to breathe, causing death or loss of consciousness
6. laceration	a cut, a tear in the skin or flesh (especially with irregular edges, and done with a sharp object)
7. abrasion	a damaged area of the skin where it has been rubbed against something hard and rough

8.	to die because you have been underwater too long and you cannot breathe
9.	injuries or marks caused by fire, heat or acid
10.	a sudden painful feeling you get when electricity passes through your body
11. hernia	a medical condition in which part of an organ is pushed through a weak part of the body wall
12. scalds	injuries to the skin from very hot liquid or steam
13.	pressing or squeezing something so hard that is damaged or injured
14. amputation	to cut off somebody's arm, leg, finger or toe (in a medical operation)
15.	a blue, brown or purple mark that appears on the skin after somebody has fallen, been hit, etc.

e) Fill in the gaps with the following words.

bruises	sprained	bodies	strain	fracture

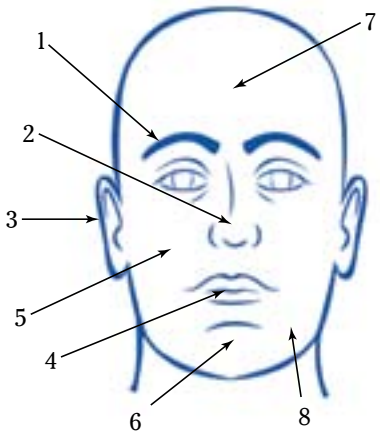
1. I stumbled and …….. my ankle.
2. He wasn't wearing a hard hat and, as a result of the fall, he suffered a …….. of the skull.
3. Exercising without a proper warm-up can cause muscle …….
4. Tears protect the eye from potentially harmful foreign …….
5. He got into a fist fight in the bar last night and his face is now covered in ……

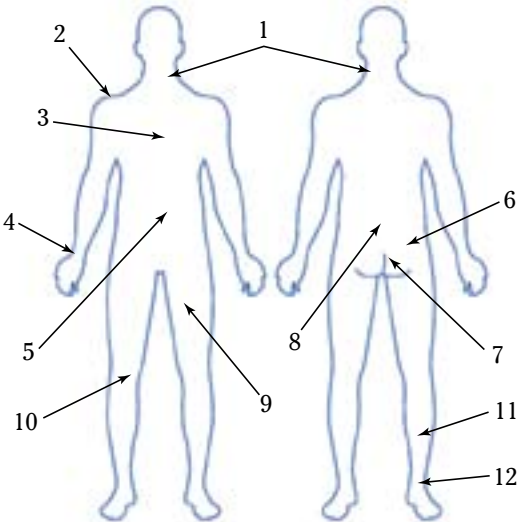
f) Parts of the body: Put the words under the correct part of the body in the lists below.

calf	~~skull~~	thigh	ribs	~~ankle~~
collar bone	tongue	upper arm	nail	forearm
~~palm~~	forehead	thumb	spine	heel
cheek	sole	eyebrows	toe	tooth
jaw	elbow	finger	lip	~~wrist~~

Hand	***Leg***	***Foot***	***Arm***	***Mouth***	***Face***	***Skeleton***
	ankle					skull
palm			wrist			

g) Write up the parts of the body / face shown in the diagrams.





[FACE]

1. E _ _ _ _ _ w
2. N _ _ e
3. E _ r
4. M _ _ _ h
5. C _ _ _ k
6. C _ _ n
7. F _ _ _ _ _ _ d
8. J _ w

[BODY]

1. T _ _ _ _ t
2. S _ _ _ _ _ _ r
3. C _ _ _ t
4. W _ _ _ t
5. S _ _ _ _ _ h
6. H _ p
7. B _ _ _ _ m
8. W _ _ _ t
9. T _ _ _ h
10. K _ _ e
11. C _ _ f
12. A _ _ _ e

II. Describing injury

- **I injured my arm…**

Being injured
- have a fall / an injury
- hurt / injure your back/leg
- pull / strain / tear a muscle/ tendon
- sprain / twist your ankle/wrist
- break a bone / three ribs
- fracture / crack your skull
- bang / hit your head

Treating injuries
- treat somebody for burns / a wound
- clean / dress / bandage / treat a wound
- put on / apply (or take off) a bandage/a sticking plaster
- need / require stitches
- put on / rub on / apply cream/ointment/lotion
- have an X-ray
- have an operation

- **I feel ill…**

The patient:
- feel ill / sick / nauseous
- have a headache / stomach ache
- have a high temperature (a fever in American English)

The doctor:
- examine a patient
- diagnose a disease
- prescribe drugs / medicine / medication / pills / painkillers / antibiotics

Useful verbs: ***injure / hurt / wound***

• I ***injured*** my arm when I fell off the ladder. *injure* (verb): if you injure somebody, you cause physical damage to part of their body, usually the result of an accident or through fighting. Also: *injured / injury* (nouns), *injured* (adj.) • The ***injured*** were taken to hospital by helicopter. • Their ***injuries*** were very serious. • He was not seriously ***injured,*** but they took him to hospital as a precaution. Useful collocation: *seriously injured*	• Tell me where it ***hurts***. • My arm ***hurts***. • Ouch! Don't touch me. That ***hurts***! *hurt* (verb): if part of your body hurts, you feel pain there. Also: *hurt* (adjective) • They were suffering from shock but did not seem to be otherwise ***hurt***. Useful collocation: *badly hurt*	• He was ***wounded*** by the bullet. *wound* (verb): if you wound somebody, you inflict physical damage on part of their body, esp. a cut in their flesh caused by a knife, or some other weapon (often in battle). Also: *wound* (noun), *wounded* (adjective) • The open ***wound*** really needed stitches and took a long time to heal. • The four ***wounded*** men were taken to the field hospital in the back of the jeep. Useful collocation: *mortally wounded*

a) Use words from the tables above to fill in the gaps.

1. After the explosion, the two …… seafarers were taken to hospital.
2. I feel …… . It's my stomach! I want to throw up.
3. I cut myself with the hacksaw. It's a deep ……..... .
   Let's see. You must clean it and …….. it immediately to stop the bleeding.
4. Did the dermatologist ……. anything for your skin allergy?
   Yes, she gave me some cream to …….. twice a day.
5. Doctor, I have a …….. temperature, a sore throat and my nose is running.
   Well, you might have a cold or the flu. Don't take any antibiotics, just get some rest and some paracetamol.
6. I …… my head on the door. It …… a lot!

b) Fill in the gaps. Use the words in the box.

sprained	operation	put on	stitches
headache	bruises	painkillers	fractured

1. It's a deep cut, I think it requires …….. .
2. I have a terrible …… . I need a couple of strong …… to help me make it through the day!
3. He landed awkwardly after a jump while playing basketball and ……. his ankle. He's lucky it's not broken.

4. That's not a cut - it's just a scratch. …….. a sticking plaster and don't make such a fuss!
5. The X-ray showed that I …….. three ribs in the accident. I must have a(n) ……..... ..... .
6. The Chief Engineer fell down the ladder and was lucky to get away with a few……. .

c) Use the following verbs which describe personal injury to complete the sentences. Change the verbs into the Past Simple tense.

cut	burn	break	bruise	strain

1. The assistant cook …… his hand in the galley fire.
2. The pilot …….. his leg when he fell from the pilot ladder.
3. The bosun …… his back when he lifted some heavy equipment.
4. The apprentice engineer ……..…… his knee when he bumped into a pipe.
5. The fitter ……..... his finger when the chisel slipped from his hand.

d) Fill in the table with the appropriate derivatives.

NOUN	VERB	
1. …….	cure	(a disease)
2. prescription	…….	(medicine, pills, etc)
3. treatment	…….	(a patient)
4. ……..	vaccinate	(against the flu / measles, etc.)

e) Use words from the table above to fill in the gaps. Change the verb form if necessary.

1. Are you ……..…… against yellow fever?
2. Doctors and researchers all over the world are trying to find the …….. for cancer.
3. After the accident, he was ……..……. in hospital for first degree burns; in fact, he stayed in hospital for two weeks.
4. Take the …… to the pharmacy; I need to start taking these pills as soon as possible.

f) In pairs, talk about injury. Describe physical symptoms and identify the type of injury.

Student A: You are the patient.
Tell your study partner your symptoms.

1. I fell on my hand. My wrist hurts, especially when I try to move it, and it is swollen.
2. I injured my belly. I am coughing up blood and I feel faint.

For example:
Student A:
I am bleeding from the nose.

Student B: You are the doctor.
Listen to the symptoms and identify the type of injury.
Give a suggestion for treatment.
Go to page 495 for help.

Student B:
Sit with your head over a bowl. Pinch the soft part of your nose for 10 minutes. Don't lie down.

2. First Aid

I. First aid advice

a) What is the first aid you must give in each case[2]? Write it in the space provided.

⇨ ***Apply ice to the injury.*** ⇨ ***Hit the victim firmly on the back between the shoulder blades.*** ⇨ ***Put pressure on the wound.***

	First Aid	***Learn more***
Chocking		This will dislodge the blockage in the airway and allow the person to breathe again.
Heavy bleeding		This will stop or slow down the flow of blood.
Strains & sprains		This will reduce the swelling and pain.

b) In pairs, use the completed table and tell each other.

What is the first aid for someone who is chocking?
The first aid for someone who is chocking is to ....

c) First aid advice: Burns[3]

i. What is the best First Aid advice for burns? Must you or must you not do the following things? Circle the sentences you think offer good first aid advice for burns.
ii. Listen to check if you were right. Write YES or NO in the space provided.

Burns	***YES / NO***
Cool the burn down by pouring running water.	
Pour large amounts of water for at least 10 minutes over the burn.	
Talk to the casualty and explain what you are doing.	
Remove any jewellery, such as rings or watches.	
Remove any clothing that is stuck to the skin over the burn.	
Put cream or lotion onto the burn to relieve the pain.	

2. First Aid Advice from the website of the British Red Cross, found at www.redcross.org.uk
3. Recorded First Aid Advice from the South East Coast Ambulance Service, National Health System, UK.

Cover the burn loosely to protect it from infection.	
Wrap the wound up tightly with a dressing.	

d) Match the injury to the first aid treatment[4]. Draw arrows.

Injury	*What to do*
1. Burns and scalds	… Get the casualty into fresh air, give artificial respiration
2. Suffocation (asphyxia)	… Cool as quickly as possible with running cold water and apply a clean dry dressing (covering) to the burned area
3. External bleeding	… Do not make the casualty vomit; give a glass of milk; do not give painkillers by mouth, use suppositories or a pain-killing injection
4. Poison swallowing (such as bleaches, disinfectants, corrosives)	… Lay the patient down, lift up the affected area if possible, press firmly where the blood comes from

e) Look at the figures below and match them to the recommended first aid treatment. Give the correct title for each figure.

1. 

2. 

3. 

Picture:

	BLEEDING FROM THE NOSE Ask the casualty to sit with his head over a basin or bowl while pinching the soft part of the nose firmly for 10 minutes.
	HOW TO DRESS A WOUND Use a standard dressing (consisting of a thick pad of gauze which is attached to a bandage); place the pad upon the wound and take the bandage round the wound.
	WRIST AND PALM BANDAGE Place palm on the middle of a narrow fold bandage, cross the bandage at the back of the hand, leaving out the thumb.

4. First aid advice from Ship Captain's Medical Guide by Maritime and Coastguard Agency, UK.

II. First aid kit

a) Listen to a presentation on the contents of a home first aid kit[5]. Circle the items mentioned. The first one has been done as an example.

- Gauze
- Tape
- Bandages
- Eye Wash
- Ointment
- Wipes
- Hydrocortisone Cream
- Aspirin
- Burn Wrap
- Compress
- Elastic Bandage
- Scissors
- Synthetic Gloves
- Thermometer
- Tweezers
- Emergency guide

b) Draw arrows to match the words to the pictures.

Gauze
Antibiotic ointment
Adhesive tape
Sticking plaster
Sling

5. 13 Essentials for a First Aid Kit from Answers.com videos.

c) What do you use the following first aid items for? Write the correct heading above each list.

Common problems	Sprains and fractures	Cuts – Minor Trauma

Bandage strips	Aspirin	Adhesive tape
Gauze pads	Peptic relief tablets	Elastic bandage
Roll gauze	Thermometer	Finger splint
Synthetic gloves	Eye wash	Ice pack
Antibiotic ointment	Cotton swabs (pads or wipes)	Splint
Disinfectant	Seasickness remedy	Triangle sling

d) What is the purpose of the items used in first aid?

In the ship's stores you will find the following first aid items:

roller bandage	thermometer	splint(s)
saline solution	resuscitation device	tweezers

Read about their suggested use and write the appropriate name in the boxes provided.

Use:		***Name:***
1. You apply it to a limb to relieve pain by immobilizing the fracture and prevent further damage to the surrounding muscles or nerves.		
2. You use it to remove splinters (splinter: a small think piece of wood, metal, glass etc. that has broken off a larger piece).		
3. You use it to flush wounds and skin abrasions, rinse eye, nose, also for IV (intravenous infusion).		
4. You use it to take temperature.		

5. You use it to secure wound dressing in place.		
6. You use if for protection during rescue breathing or CPR (Cardi-opulmonary Resuscitation).		

III. The ABC of Resuscitation

a) Read the text below and do exercises (i) to (iv) that follow.

(IMO Lessons Learned FSI 14, No 11)

What happened?

During a loaded voyage on board a bulk carrier, the chief mate and a deck cadet went inside one of the vessel's bilge space enclosures to repair a sounding pipe. They walked inside the duct keel and then through a steel hatch, they removed a manhole cover and crawled inside the bilge space enclosure. The crew members started working on the sounding pipe but about an hour later, a second cadet ***found them unconscious*** inside the enclosed space. The alarm was raised and the two crew members were pulled out to the main deck. ***First aid was administered***, however they were both proclaimed dead later that evening.

Why did it happen?

1) The bilge space enclosure had been closed ***for a considerable period*** and the atmosphere inside the space was non-life supporting.
2) ***Prior to entry,*** the atmosphere inside the bilge space enclosure was not tested ***as required*** by the company's safety management system.
3) A Permit-to-Work was not issued before access was made inside the enclosed space, as required by the procedures laid down in the safety management system manual.
4) The Master ***was not aware of*** the work in progress.
5) The chief mate involved ***failed to appreciate*** a life-threatening situation inside the bilge space enclosure.
6) Evidence indicates circumventing of safety norms and procedures.
7) The chief mate *was* ***likely to have consumed*** more alcohol than the limit stipulated in the company's safety management system.

i. What is the correct title for the incident? Choose from the ones below:

– CARELESSNESS CAUSES SERIOUS INJURY TO TWO CREWMEMBERS
– FATAL ACCIDENT IN AN ENCLOSED SPACE
– ALCOHOL ABUSE CAUSES NEAR MISS ACCIDENT

What type of injury took place?
What type of first aid must you provide in this case?

ii. Match the two halves of the following sentences:

A. A Permit-to-Work	☐ didn't follow the correct safety procedures.
B. The atmosphere inside an enclosed space	☐ must be issued before entering an enclosed space.
C. The chief mate	☐ can affect people's judgment and impair safe behaviour.
D. The chief mate	☐ didn't realize the situation was dangerous.
E. Small quantities of alcohol	☐ must be tested before entry.

iii. What do the following phrases from the text mean? Choose (a) or (b).

1. *"found them unconscious"*
   a. they were feeling sick
   b. they were not awake, they had lost their senses
2. *"First aid was administered"*
   a. they gave the two crew-members first aid
   b. they delayed giving first aid
3. *"for a considerable period"*
   a. for an insignificant period of time
   b. for a long period of time
4. *"Prior to entry"*
   a. after entering
   b. before entering
5. *"as required"*
   a. it is obligatory, you must do it
   b. you can choose to do it or not, it's optional
6. *"was not aware of"*
   a. did not know
   b. forgot about
7. *"failed to appreciate"*
   a. did not recognize
   b. did not care about
8. *"was likely to have consumed"*
   a. definitely consumed
   b. probably consumed

Glossary

enclosure	an enclosed area or space
sounding pipe	a pipe through which the depth of liquid in a water or oil tank on board a ship can be measured or sounded
manhole	a hole, with a cover, through which a person can enter a closed tank or similar structure
to crawl	to move forward on your hands and knees, with your body close to the ground
life-threatening	that is likely to kill somebody
to circumvent	to find a way of avoiding to follow a rule

iv. Match the phrases to form correct collocations.

1. raise	dead
2. he was proclaimed	the alarm
3. safety management	a permit
4. issue	situation
5. the work	system
6. life-threatening	in progress
7. enclosed	procedures
8. safety	space

b) There are three instruction sentences missing from the following text. You will find them below the text. Read carefully and write the missing instructions in the appropriate space.

ABC of Resuscitation[6]

The ABC of resuscitation stands for Airways, Breathing and Circulation. These are the signs you should check on finding a casualty. Determine if the casualty is conscious and if there are signs of breathing and circulation. Follow the ABC procedure whenever you find a casualty and then treat for the specific injury.

- **A – Airways**: Ensure the airway is open. Remove any obstruction from the mouth. To open the airways, ……
- **B – Breathing**: Check that the casualty is breathing for 10 seconds. If there are no signs of breathing or if in doubt ……
- **C – Circulation**: Find the pulse in the neck or wrist and check for 10 seconds. If there are no signs of a pulse, ……

In cases where circulation has failed, breathing will also stop. In this case you will have to alternate between artificial ventilation and chest compressions. This technique is called cardio-pulmonary resuscitation (CPR).

…commence chest compressions.	…commence artificial ventilation by using the mouth-to-mouth or mouth-to-nose techniques.	…lift the chin and press the forehead backwards to tilt the head back.

c) Listen carefully to the following First Aid advice. Do the exercises below.

i. Breathing but unconscious

Lead-in: What is the first aid advice for a victim that is breathing but unconscious? Must you move the victim? Listen to find out.

1. Underline the correct alternative:
   – Place the victim *with their head up / on their side* to protect their breathing.
   – Do not move the victim if they've hurt *their back or neck / their head.*
   – Check for signs of *circulation / sweating.*
   – Check for a pulse at *the neck / the wrist.*
   – If the victim is bleeding, *do not touch / press firmly on* the wound.

2. True or False? Write "T" or "F" in the box.
   ☐ You must never move a victim who's hurt their back, even if their breathing is noisy or their mouth is blocked with blood or vomit.
   ☐ The signs of circulation are coughing, movement and normal breathing.
   ☐ The most important thing to remember is to check if the victim is breathing every 5 minutes or so.

6. From SOLAS Manual, Methane Jane Elizabeth, Ceres LNG Services Ltd., December 2007, 11.2 p. 2 of 8.

ii. CPR for adults

What is the number of chest compressions and breaths you must give in CPR? Listen to the first aid advice and fill in the rule in the box.

Give ..... chest compressions and then give ..... breaths. Continue with this sequence.

RECOVERY POSITION: An unconscious but breathing casualty can be placed at this position as part of first aid treatment; it helps the casualty breathe and permits fluids to drain from the nose and throat so that they are not breathed in.

3. Personal Protective Equipment

A. *Fill in the missing words in the text below*[7].

feet | the body | eye | the head | skin | hands

MAIN PERSONAL PROTECTIVE EQUIPMENT USED ON BOARD SHIP

1. ***Protective clothing:*** Protective clothing is a coverall which protects ..... of the crew member from hazardous substances like hot oil, water, welding sparks etc. It is popularly known as "boiler suit".
2. ***Helmet:*** The most important part of the human body is ..... . It needs utmost protection which is provided by a hard plastic helmet on the ship. A chin strap keeps the helmet in place when there is a trip or fall.
3. ***Safety shoes:*** Safety shoes ensure that nothing happens to crewmembers' ..... while working or walking on board.
4. ***Safety gloves:*** They are used in operations where it becomes imperative to protect one's .....……. . Different types are provided on board ship: heat resistant gloves to work on hot surface, cotton gloves for normal operation, etc.
5. ***Goggles:*** Protective glasses or goggles are used for ..... protection in daily operations.
6. ***Ear muff/plug***: In the Engine room of the ship 110-120 db of sound is produced, which is very high for human ears. Even few minutes of exposure can lead to headache, irritation and sometimes partial or full hearing loss. Ear muffs or ear plugs are used on board ship to dampen the noise to a bearable decibel value.
7. ***Face mask:*** Painting, carbon cleaning, etc. involves minor hazardous particles which are harmful for the human body if inhaled directly. To avoid this, face masks are provided which act as a shield from hazardous particles.

7. 10 Main PPE used on board ship, from www.marineinsight.com

8. ***Safety harness:*** Routine ship operation includes maintenance and painting of high and elevated surfaces which require crew members to reach areas that are not easily accessible. To avoid a fall from such heightened areas, a safety harness is used.
9. ***Chemical suit:*** Use of chemicals on board ship is very frequent and some chemicals are very dangerous when they come in direct contact with human …… . A chemical suit is worn to avoid such situations.
10. ***Welding shield:*** Welding is a very common operation on board ship for structural repairs. A welder is provided with a welding shield or mask which protects the eyes from coming in direct contact with ultraviolet rays.

B. ***Look at the following phrases / words from the text. What do they mean? Choose the correct alternative.***

1. *utmost protection*
   a. greatest protection
   b. simple protection
2. *it becomes imperative*
   a. it becomes irrelevant
   b. it becomes very important
3. *heat-resistant*
   a. that increases the heat
   b. not easily damaged by heat
4. *to dampen the noise*
   a. to make the noise less strong
   b. to filter the noise
5. *bearable*
   a. it can be accepted or dealt with
   b. too painful or annoying or unpleasant to deal with or accept
6. *elevated*
   a. higher than the area around
   b. rough, uneven

C. *Put the words in the correct list. Some are given as examples.*

Dust mask	Thermal gloves	Welding gauntlets	Impact gloves	Full face mask
Safety boots	Latex gauntlets	Arc welding helmet	Barrier cream	Ear plugs
~~Riggers gloves~~	Hard hat	~~Ear defenders (ear muffs)~~	~~Boiler suit~~	Thermal suit
Half face mask	PVC gloves	Wellington boots	PVC wet suit	Safety shoes

					
Head protection	Foot protection	Hand protection	Respiratory protection	Skin protection	Hearing protection
		Riggers gloves		Boiler suit	Ear defenders (or ear muffs)

Glossary

gauntlet	a strong long glove with a wide covering for the wrist
riggers gloves	gloves for rigging, fitting equipment, handling ropes, etc.
respiratory	connected with breathing

D. *Match the PPE words given in the table above to the correct picture/description below.*

1.		…… dust mask …….. Protects from: non-toxic, heavy dust particles such as some cargo dusts and abraded paint dust.
2.		…….. Protects from: arc welding light, radiation and splatter (also, a flame retardant scarf and apron should always be worn when arc welding).
3.		……..……. Protects from: falling objects, swinging lines, hair entanglement, chemical, paint and hot water drips.

4.		……..…….. Protects from: fine dusts and some fumes but relies on a good seal to the face. It is supplied with interchangeable filter pads.
5.		……..…….. Protects from: rain and salt water, some mild chemicals and oils. Should be a high visibility colour for deck and tank operations.
6.		……..……. Protects from: general dirt and grime and entrapment in moving machinery. Should be flame retardant and long-sleeved.
7.		……. Protects from: fine dusts, and some fumes and affords protection to eyes and face.
8.		…….. Protects from: cold. Use when working in refrigerated compartments or in cold climates. Can be worn under a PVC wet suit where weather conditions dictate.
9.		…… Protects from: light soiling from non-hazardous substances. Helps prevent dermatitis.
10.		……. Protect from: soiling and abrasion. Use for manual handling or ropes and machinery.
11.		…… Protect from: vibration. Use when operating needle guns, jack hammers and impact tools.

12.		…….. Protect from: heat, welding splatter and abrasions. Use for arc and gas welding flame cutting and grinding.
13.		……..…….. Protect from: abrasion, oil and mild chemicals. Use for bunkering, oil cargo operations and appropriate engine room work.
14.		…… Protect from: abrasion, oil and many chemicals. Use for chemical handling, chemical cargo operations and sand blasting work.
15.		…… Protect from: cold. Use for work in refrigerated compartments and on deck in cold climate. Can be worn under work gloves.
16.		……..…… Protect from : low level sound energy; they are inserted directly into the ear canal.
17.		…… Protect from heavy impact and sole penetration, ankles protected from impact. They usually have steel toe caps, steel sole plates and oil resistant soles.
18.		…… Protect from: light impact and minor sole penetration. Shoes do not offer ankle protection and may not have steel toe caps.
19.		…… Protect from: a higher level of sound energy, but not all possible sound dangers. Only effective when a tight seal to the head is maintained.
20.		…… Protect from: water, oils and many chemicals. Should have steel toe caps and steel sole plates.

E. *What is the name of the following specialized PPE?*

	Safety h _ _ _ _ _ _	Protects from: falls. Use when working more than 2m above deck level or when working out board.
	Personal g _ _ m _ _ _ _ _ _	Warning of: owxygen depletion and toxic or explosive gases.
	A _ _ _ _	Protects from possible burns created from sparks

F. *Match the signs to the names of the protective equipment.*

Eye protection

1. Safety goggles
2. Gas welding goggles
3. Safety glasses
4. Face shield

(a) 

(b) 

(c) 

(d) 

G. *Choose the correct equipment for your safety. What PPE must you wear for the specific tasks on the following occasions?*

– You are supervising cargo operations in a dry bulk carrier; there is cargo dust to deal with.
– You are going on deck to check for ice damage, your vessel is in the Baltic Sea.
– You are handling the mooring ropes.
– You are grinding metal in the E/R workshop.
– You are removing heavy lifts in the engine room.
– You are doing fumigation in a dry bulk carrier.

e.g. You need the …. to protect yourself from …..
You must wear a …. when you work… / when you use…

H. *What are the works done in each picture? Are the crewmembers using the correct protective equipment?*

Talk about the pictures; use some of the phrases below for help.

scaffolding for painting the funnel / on scaffold / on ladder /
painting inside the hold / sand blasting / chipping / chipping hammer /
arc welding / washing / water hose

(a) 

(b) 

(c) 

(d) 

(e) 

(f) 

1. ***Listen to injured seafarers talking about their injury. What was the injury? What was the cause of the injury? Was the seafarer wearing appropriate PPE? Fill in the table for each case.***

	Injury	***How did it happen?***	***PPE (yes / no)***
Case #1			
Case #2			
Case #3			

3. ***What is the correct question to ask in each case? Choose the best one for each case.***

Did you have your gloves on? Did you have a safety harness on? Did you use a hoist?
Were you wearing goggles? Were you wearing a face mask?

4. Occupational Accidents

I. Slips, trips and falls

Lead-in: Look at the following safety sign.

- What type of accidents does it warn about?
- Do you think such accidents are common on board ships?
- Where on board ships can they happen?
- How can we prevent them?

Read and find out more[8]:

Mitigating slip, trip and fall hazards

Slips, trips and falls (STFs) account for the majority of occupational accidents aboard ship. Here is a list of some of the hazards that can be encountered and some ideas as to how to mitigate them.

8. The International Maritime Human Element Bulletin, No 17, May 2008 [www.he-alert.org]

Hazards

Slips	Trips	Falls
• inappropriate foot-wear • inattention • loose / unattached rugs & mats • oil & grease • polished deck sur-faces • wet or slippery decks	• loose fittings on stairs • frayed rugs / carpets • inadequate hand-holds • loose or no handrails or stair rails • unmarked deck fit-tings	• corroded ladders • improperly secured gangways • inadequate guardrails in con-fined spaces, tanks and voids • inadequate scaffolding • lack of guardrails, chains or manropes at hatch openings • loss of balance • poor illumination • shaky ladder or ladder with slippery or broken rungs

In service

- clean up spills
- conduct safety training
- do not leave equipment, stores lying around the decks
- erect safety rails
- follow safety procedures
- mark unavoidable tripping hazards
- post safety notices
- provide extra lighting when needed
- rig upper deck safety lines in rough weather
- wear personal protective equipment (PPE)
- wear lifejackets when working in the vicinity of ship's side
- wear safety harness when aloft

Glossary

to mitigate	to make less harmful, serious, etc
occupational accidents	work-related accidents
frayed (rugs / carpets)	unraveled or worn at the edge; the threads in the rug/carpet start to come apart
rung (of a ladder)	the bar that forms a step in a ladder

– What can you do to prevent STF accidents on board? Look at the pictures and tell the class.




II. Common injuries on board: causes and prevention

a) Read about an occupational accident, reported by IMO. Is such an occupational accident (and the types of injuries that are suffered in it) common?

A broken leg sustained during a berthing operation *(IMO FSI14, No14)*

What happened?

A ship was in the process of berthing in a relatively strong wind and tide. The master on the bridge was using the main engine, rudder and bow thrusters to hold the vessel alongside while the mooring lines were (1) …… ashore by the forward and after mooring parties. The forecastle party, led by the boatswain, had run a line from each of the port and starboard mooring winches before being made fast ashore. Tension came on the forward mooring lines suddenly which (2) ……..…… one line to part where it was led around a roller fairlead. The section of the line between the fairlead and the winch drum snapped back and (3) ……..…… the boatswain's right leg in two places.

Why did it happen?

1. The mooring rope which parted was in a poor condition.
2. The maintenance of the ship's mooring lines was inadequate.
3. The boatswain was standing in an unsafe position in the "snap-back" zone of the mooring line.

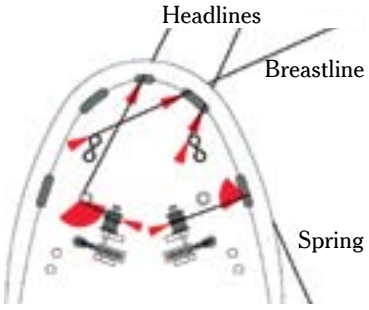
What can we learn?

Mooring operations carry risks due to the loads placed on lines and equipment. Mooring lines must be regularly inspected and carefully (4) …… . Working within the "snap-back" zone of a loaded mooring line can be dangerous and should be (5) ……... .

Now, fill in the missing verbs in the text above:

caused / avoided / fractured / maintained / passed

What is a ***snap-back zone***? A snap-back zone is where crew could be hit by snapped rope; it is the dangerous zone where, if the mooring line slacks, the line will roll out so fast it would snap back at the people around it.



b) What are the causes of minor accidents on board? What do you think?

Carelessness? Overconfidence? Fatigue?
Lack of training? Other?

The OS was **careless** and he was hit by the snapped rope.	⇨ careless, overconfident, etc. (*adjectives* that describe the person)
Many fires on board are the result of **carelessness**.	⇨ carelessness, overconfidence, etc. (*nouns* for the problem in general)

5. SMCP: Occupational Safety [B2/2] / Requesting Medical Assistance [A1/1.3]

A. The following exchange is about an occupational accident on board. Put the missing sentences in the correct place. Choose from the sentences in the box below.

What kind of assistance is required?	Report injured persons.
What happened?	Secure the danger area and report.

	There is an accident in the engine room.
(1)	
	The number of injured persons is two.
Provide first aid.	

(2)	
	Explosion in auxiliary boiler.
(3)	
	The danger area is secured.
(4)	
	Medical assistance is required.

B. ***In pairs, use the information from the following accident and produce a dialogue like the one on occupational accidents above. Report the accident to the bridge. Expand your dialogue and think of possible injuries suffered by the victim, the type of assistance that is required, etc.***

Fall from height

IMO Lessons Learned, FSI 16, No 27)

What happened?

During work on deck, a crew member fell from a height of approximately 7 m from the hatch cover (in no 2 hatch, the hatch cover extends up to the outer side of the vessel) onto the pier.

Why did it happen?

There were no structural measures (permanent safeguards such as permanently installed ladders) to prevent falling overboard at this place. The seaman was not wearing any personal fall protection equipment.

C. ***Match to make full phrases.***

1. Take	casualties
2. Secure	height
3. Report	immediate action
4. Fall from	gas
5. Leakage of	an accident report
6. Prepare	the area

D. ***Listen to the announcement. Tick the correct box.***

The announcement is ….

- ☐ informing all crew members on the next training session on occupational safety.
- ☐ briefing all crew members on winter conditions.
- ☐ briefing all crew members on the storm.
- ☐ briefing all crew members on restricted areas.

E. *Fill in the correct word.*

take	substances	appoint	conditions	instruct

1. …… crew on occupational safety before departure.
2. Dangerous goods of IMO class 6 are carried on deck (in roped-off areas). Brief all crew members on the symptoms caused by dangerous…… .
3. …… an officer in charge of safety before work.
4. …… additional safety measures for the work in extreme weather …… .

F. *Fill in the gaps with the correct derivatives of the words in capital letters.*

1. …… in training sessions on occupational safety is mandatory.	**PARTICIPATE**
2. Have special …… on cargo securing and …… .	**INSTRUCT** **ILLUMINATE**
3. Check the ……..…. and …… of the occupational safety equipment and report.	**COMPLETE** **AVAILABLE**

G. *Requesting medical assistance. Fill in the message markers in the following exchange.*

QUESTION – ANSWER – INFORMATION – ADVICE – REQUEST

PAN PAN – PAN PAN – PAN PAN Calling Port Livorno, This is Alto - CBRE …… I require medical assistance.
Alto – CBRE, this is Livorno Radio Station …….. What kind of assistance is required?
…… I require radio medical advice and immediate hospital transfer. I have two crewmembers seriously injured after fall.
…… Stand by on VHF channel 16. I will arrange for radio medical advice on VHF channel 16. I will send boat to transfer casualties. …… Boat ETA within 1 hour.

H. *Match the two halves to make full sentences.*

1. I require	... doctor on board?
2. What kind of	... injured person is not possible.
3. Helicopter ETA	... medical assistance.
4. Do you have	... within 2 hours.
5. Can you make	... assistance is required?
6. Transfer of	... on VHF channel 16.
7. I will arrange for radio medical advice	... rendezvous near pilot station?

Round-up

A. Vocabulary Consolidation Self-Assessment.

Tick ☑ what you can do. Cross ☒ what you still find hard to do in English.

- ☐ Describe personal protective equipment used at sea
- ☐ Describe injury
- ☐ Discuss occupational accidents at sea
- ☐ Name items used in first aid treatment and their purpose
- ☐ Name parts of the body
- ☐ Use SMCP for requesting medical assistance
- ☐ Use SMCP for occupational safety

B. Class Project.

- Look up the Safety at Work Requirements Against Falling, from *Accident Prevention Regulations*, and report to class.

C. Circle the correct alternative.

1. In CPR for adults, give 30 chest *compressions / pressures* and then give 2 effective breaths.
2. For the first aid treatment of burns, do not put cream or lotion onto the burn to *relieve / reassure* the pain. Loosely cover the burn to protect it from *treatment / infection* but do not wrap it up tightly with a dressing.
3. You can use *tweezers / a bandage* to secure a wound dressing in place.
4. You apply *a splint / an adhesive tape* to a fractured limb to immobilize it.
5. You use a thermometer to take *temperature / fever*.
6. You use *ointment / saline solution* to flush wounds, rinse the eyes or nose, and also for IV (intravenous infusion).
7. Face masks act as a shield to protect you from hazardous particles, which if *inhaled / exhaled* directly, are harmful.
8. Not wearing ear plugs in the engine room can lead to *partial / one-sided* or full hearing loss.
9. Mooring incidents occur because inexperienced crew do not stay out of *snap-back / break-up* zones.

UNIT 13

Call The Watch Engineer

1. *Bunkering*
2. *Preventing / Combating oil spills*
3. *Maintenance duties in the deck department*

Round-up

1. Bunkering

I. Procedures and responsibilities

Lead-in: pre-bunkering procedures / check what you know.

i. Listen to the Chief Officer reporting to the Master before bunkering starts. Circle the phrases you can hear.

bunker barge, alongside, plug all scuppers,
bunkering checklist, secure moorings, sound the tanks,
put fenders in position, rig firefighting equipment

ii. What other actions can you hear about which are part of the pre-bunkering procedure and are not included in the phrases above?

iii. Vocabulary assessment: The following words are *key words for a bunkering procedure*. How well do you know them? Use the vocabulary development scale to rate the following words:

5 can explain and use in different contexts
4 use in a limited way in speaking/writing
3 understand the "gist" of it
2 recognize but don't understand
1 unknown to me

☐ Fenders	☐ Scuppers	☐ Tank sounding	☐ Bunkering checklist
☐ Drain	☐ Oil spill	☐ Contingency plan	☐ Topping off
☐ SOPEP	☐ Fill sequence	☐ Alongside	☐ Bunker pre-loading plan
☐ Ullage	☐ VRP	☐ Bunker samples	☐ Taking on bunker fuel
☐ Tank overflow	☐ Pumping rate	☐ Drip tray	☐ Bunker connections
☐ Plug	☐ Hoses	☐ Bunker barge	☐ Oil absorbent materials

a) Read the text and choose the correct alternative of the words in bold.

Marine bunkering is the ***supply/capacity*** of fuel oil for ships ("Bunkers" is the term used in the shipping industry for the fuel oil ***wasted/consumed*** by ships while travelling from one destination to another). A range of products and qualities are used for bunker fuel. Fuel can be loaded in different ways, depending on the destination of the bunker material and the ***facilities/arrangements*** at the bunkering terminal.

- If a ship is able to load directly from the bunkering depot, simple pipeline loading is possible.
- Where a ship requiring bunkering is unable to ***dock/land*** at the terminal, a barge, equipped with fenders, hoses and pumps, is used to bring the product alongside the ship for off-loading.

b) What is shown in the following pictures? Talk about them and match them to the descriptions given below.

- Fenders
- Land-sea bunker hose connection
- Bunker barge alongside
- Oil terminal
- Crewmember handling bunker hose
- Passing a bunker hose (from bunker barge to the vessel)

(a) 

(b) 

(c) 

(d) 

(e) 

(f) 

c) Vessel procedures: Bunkering – Responsibility.

Listen about the assigned duties in bunkering and fill in the five missing ranks in the table below. Use the following:

Chief Officer / Second Officer / Chief Engineer / Second Engineer / Third Engineer

Bunker pre-loading plan – Crew assignments

Rank	***Duties***
	Over all in-charge supervising the process
	In-charge on deck
	Monitor tank levels & valve alignment
	Tending mooring lines
	Tank soundings/Ullages
A.B.	Watch at bunker header
A.B.	Deck-Rover watch

d) Look at the duties in the table of exercise (c) and complete the Glossary.

Glossary

.....	giving your attention to; care for or look after
.....	arrangement in a straight line or in correct positions
.....	the amount that a container, such as a fuel tank, lacks of being full; the distance from the surface of the oil in a tank to the top

e) Do the following actions belong in the "Before Bunkering", "During Bunkering" or "After Bunkering" safety procedures? Write them in the appropriate spaces in the list that follows.

- Reduce loading rate before topping off.
- Send bunker samples for analysis.
- Rig fire fighting equipment.
- Mop up any drips and minor spills.
- Establish communications between ship and bunkering station/barge.
- Take periodic witnessed oil samples.

Bunkering

Safety procedures before, during and after bunkering

Actions: • ..... • ..... • Position drip trays and save-alls. • Plug scuppers. • Post "No Smoking" and "No Naked Light" signs.  • Close scuttles, windows and air conditioning intakes.	***Before Bunkering*** 
Actions: • ..... • ..... • Close valves as each tank is loaded. • Notify bunker station/barge when final tank is being filled. • Allow sufficient ullage to drain hoses and lines.	***During Bunkering*** 
Actions: • ..... • ..... • Close and blank off manifold. • Blank off hose before lifting it over the side. • Unplug scuppers and open drains. • Drain and stow drip trays.	***After Bunkering*** 

Glossary

drip trays	special buckets / containers for small drops of oil that might fall from the connection
save-all	a receptacle (container) for catching leakages
scuttle	a small opening or hatch with a movable lid in the deck or hull of a ship (an opening with a cover in a ship's deck or side)
blank off	block off, cover completely

f) What are the proper actions related to this picture?

Write them here:

- .....
- .....
- .....
- .....

g) Below you will find some of the points that you must check for a safe bunkering procedure. Choose the correct alternative of the words in italics and write up the missing words (the first letter is given). The safety procedure guide on the previous page will help you.

Before bunkering: check

- vessel and barge are moored *securely / strongly*
- safe access between ship and bunker barge
- the deck watch is *totally / fully* briefed
- emergency shut down procedure is discussed and agreed
- torches, radios and other electrical equipment are suitable for hazardous area operation
- suitable protective clothing is available and being used
- bunkering area is *adequately / poorly* lit

During bunkering: check

- supply line pressure and temperature
- tank levels, and that adjacent tanks are not being *fulled / filled*
- loading *rate / tempo*
- bunker tank vent systems

After bunkering: check

- all filling valves are c _ _ _ _ d
- all lines and hoses have been d _ _ _ _ _ d and b _ _ _ _ _ d
- all bunker tank vents, sounding tubes etc., are s _ _ _ _ _ d
- all areas are free from oil and all equipment is s _ _ _ _ d correctly

h) In pairs, check the completion of bunkering procedures. Use the Present Perfect.

Note: *For information regarding the Present Perfect tense, go to page 529.*

Student A: You are the Master. Ask if the procedures have been completed. Use "you" or "we" in your questions.
Student B: You are the Chief Mate. Answer "no" to tell the Master that the bunkering procedures have not been completed yet.

For example: (agree on Emergency Stop signal)
⇨ Have we agreed on the Emergency Stop signal?
⇨ No, we haven't agreed on the Emergency Stop signal yet.

1. (note down the exact amount of bunkers we received)
2. (sound the tanks)
3. (retain a copy of the Bunker Delivery Note)
4. (inspect bunker pipelines)
5. (confirm the fenders are in position)

II. Checklists and controls

The following document is an authentic up-to-date BUNKERING CHECKLIST used in merchant vessels today. Make sure you understand it well in order to use it to exchange information about bunkering procedures.

Vessel _____ Date/Time____/____/____-____.____ Port _____

BUNKERING CHECKLIST

Prior commencing bunkering	DONE
The Bunker Pre-Loading Plan has been completed and posted.	✓
An accommodation ladder is rigged.	×
Plug all deck scuppers and ensure they are oil- and water-tight.	
Empty out and plug all save-alls.	✓
Place oil absorbent materials and oil brooms at designated locations.	
Inspect hose and couplings for damage.	
Establish two-way communication link with delivery vessel or facility.	
Agree on distinct hand signals for ship and bunker supplier.	
Sight, agree and record supplier meter readings or tank soundings.	
Ensure seamen are assigned to tend moorings.	✓
Prepare (line-up) the filling line – open all relevant valves.	✓
Check all valves on the system.	
During bunkering	DONE
Take ullages / soundings in order to determine the loading rate and cross-check the calculated against the one claimed by the supplying facility.	
When a tank is 70-80% full decrease loading rate and take ullages more often.	✓
Check continuously bunker hoses / connections for leakage.	✓
Close valves as each tank is completed.	✓

Witness, seal, date, jointly countersign, and retain bunker samples.	
Give ample warning to the terminal / barge before the final notification or the interruption of the flow.	✓
Notify supplier when final tank is reached.	
On completion, close all filling valves.	✓
After bunkering	DONE
Ensure all hoses are fully drained.	✓
Close and blank off manifold connections.	
Blank off disconnected hose couplings.	✓
Reconfirm all bunker lines and tank filling lines are secured.	✓
Reconfirm all bunker tank soundings.	
Sight, agree and record shore/barge meter readings or tank soundings.	✓
Verify all details on bunker receipt are correct.	
Complete all relevant entries in Oil Record Book and Log Books.	

Chief Officer **Chief Engineer**

a) The following verbs are included in the checklist. Match them to their meaning, after locating them in the checklist.

sight	cross-check (against)	~~witness~~	countersign	notify
assign	decrease	seal	retain	

1. .....: to keep
2. .....: to fasten or close securely
3. .....: to add a signature to (a document already signed by another person)
4. .....: to formally or officially tell somebody about something
5. .....: to manage to see or observe
6. .....: to make smaller in amount, degree, etc.
7. …… witness.....: to see something happen, to see it yourself
8. .....: to appoint to a job, allocate a job
9. .....: to make sure that the figures are correct (by using a different method or system to check them)

b) The following phrases are included in the checklist, too. Identify them and match them to their explanations.

1. accommodation ladder *is rigged* ☐ give more than enough advance notice
2. *delivery* vessel ☐ stated or asserted as true
3. *determine* the loading rate ☐ when (bunkering) is finished
4. *claimed* by the supplying facility ☐ fitted in position
5. *give ample warning* ☐ ascertain exactly
6. *on completion* ☐ the oil has run out, leaving (the hoses) empty
7. *fully drained* ☐ that supplies the fuel oil

c) In pairs, examine how safely bunkering is done on your ship.

Student A: You are supervising the bunkering process. Fill in the checklist. Ask about the actions missing in your list (where there is no check [✓] or cross [×]) and check accordingly.

Student B: Look at your own checklist and give answers on which things have or haven't been done yet. Go to page 495.

For example: *Have you completed the Bunker Pre-Loading Plan?*
Yes, I have.
Have you rigged the accommodation ladder?
No, we haven't.

d) Look at the following possible hazards that exist in bunkering. What must you do in each case? What controls are in place for you? Discuss with your partner and match to the controls that help prevent each hazard.

Hazard ***In case of...***	**Controls in place / preventive measures** ***Make sure you have done the following...***
1. Uncontrolled contact with bunker barge during mooring / unmooring	☐ Inspect bunker pipeline to ensure that there are no signs of leakages.
2. Inadequate access of personnel between ship / barge	☐ Monitor local weather forecast; abort operation if required.
3. Substandard bunker hoses / connections	☐ Verify that bunker tank high level alarms are operational.
4. Adverse sea conditions	☐ Agree, in writing, with the barge Master on the handling procedures, including the maximum transfer rates, and on the action to be taken in the event of an emergency.
5. Bunker tank overflow	☐ Provide additional fenders.
6. Inadequate maintenance condition of the bunker line	☐ Use accommodation / pilot ladder properly.
7. Inadequate ship/barge co-operation / co-ordination / communication	☐ Check visually the condition of barge hoses and flanges prior to commencement of bunkering.

e) What are the possible consequences in each case? Here are some suggestions.

collision grounding hull damage oil pollution injury

Hazard:	**Consequence:**
1. inadequate Under Keel Clearance	⇨ .....

2. substandard fendering / mooring equipment	⇨ .....
3. inadequate draining of bunker hose	⇨ .....
4. sudden tension of the hose during connection / disconnection	⇨ .....

2. Preventing / Combating oil spills

I. Oil spill prevention

a) Look at the safety procedures below. Put the appropriate picture in the correct place and fill in the gaps with the phrases in the box.

1. 	2. 
3. 	4. 

drain off	any spillage	on the water	after painting or repairs	with care

Preventing Oil Spills – Procedures to reduce the likelihood of oil spills

1. Know your ship Where are the overflow and sounding pipes? Check that they are clearly marked especially ..... . Remember that an "air-bubble" can force oil out of a goose-neck ventilator.	

2. Plug scuppers Plug scuppers when bunkering, loading or discharging oil. If there is heavy rain, then open one scupper, …… the water and replug. Repeat if necessary.	Picture:
3. Use serviceable equipment Do not use untested equipment; it may rupture or break. Cargo and bunker hose pipes should be handled …… and stored without bends that may fracture the hose.	Picture:
4. Communications and identification Agree clear signals with terminal / bunkering station. Keep a watch on valves and flanges. Frequently look over the side for traces of oil …… . Make sure you open the correct valve. Always close a valve tight and check the position indicator.	Picture:
5. Control pumping rate Slow down the rate of oil being pumped and "top-off" tanks with extreme caution. Keep a careful watch on ventilators and over-flow points.	
6. Use drip trays When hose connections are being made or broken, drip trays must be used to catch …… . Blank the ends of hoses and ship connections.	Picture:

b) Match the words to form correct collocations.

1. Oil flow	hose	4. Hand	shutdown
2. Bent	indicator	5. Position	signals
3. Emergency	rate		

II. VHF Communications / SMCP

a) Look at the communication guide for ship and bunker barge. What do the following hand signals mean?

i. Try the signals yourself and discuss in class what they mean.
ii. Write up the order for each hand signal.

Communication Guide for Ship & Bunker Barge

1.  2.  3.  4.  5.  6. 

1. H _ _ D
2. W _ _ T
3. S _ _ W
4. F _ _ T
5. S _ _ P
6. F _ _ _ _ H

IMO Standard Marine Communication Phrases

[B 3 / 1.3 Handling bunkers / pollution prevention]

b) Study the following VHF exchange between the bunker barge and the vessel and complete the missing words. Then, practise saying the dialogue in pairs.

Barge	***Vessel***
Are you ready to bunker?	
	Yes I am ready to bunker. I have prepared all safety measures. …….. barge hoses.
Barge hoses are connected. What is the pumping pressure?	
	The pumping pressure is 3 bars. Start pumping slowly.
Are you receiving?	
	Yes I am receiving. Do not exceed a ……. of bunker line of 3 bars.
Pressure steady at 3 bars.	
	We have reached 85% of tank capacity. ……. pumping rate.
I am decreasing pumping rate.	
	300 tones received – stop pumping. ……. the barge hoses.
Barge hoses are disconnected.	

c) In pairs, give the following orders and report that they are executed.

e.g. Plug the scuppers and report.
All scuppers are plugged.
Stand by fire fighting equipment and report.
Fire fighting equipment standing by.

1. Close the valves and report.
2. Fit bonding wire and report.
3. Stand by absorbent materials and report.
4. Instruct the pumpman and report.
5. Stand by spill control gear and report.

d) Where do the following phrases belong to? Write them in the appropriate space.

• Disconnect hose couplings. • Transfer fuel oil from No.1 tank to No.2 tank. • Call the watch engineer 15 minutes before the arrival at oil terminal for bunkering. • Fill up to 90% of tank capacity. • Are all hoses fully drained? • Instruct the pumpman and report.	• Start pumping. • Maintain contact on VHF channel 23 with the bunker barge / oil terminal. • Complete and sign the oil record books. • Are the barge hoses connected? • Sound the tanks and report. • Finished with pumping. There is no pumping at present.	• Fit bonding wire and report. • Have you sent the fuel oil samples for analysis? • Decrease pumping rate. Do not exceed a rate of filling of 300 t/hr. • Are the barge hoses disconnected? • Keep a safe working pressure. • We are filling No.1 starboard tank.

Before bunkering

- .....
- .....
- .....
- .....
- .....
- .....

During bunkering

- .....
- .....
- .....
- .....
- .....
- .....

After bunkering

- .....
- .....
- .....
- .....
- .....
- .....

e) Write the question for the following answers.

1. What .....?
   Sounding of No.1 H.F.O.T (S) is 500 m^3. *(Heavy Fuel Oil Tank, Starboard)*
2. Is ..... ?
   Yes, the Oil Pollution Prevention Plan is available.
3. Have ..... ?
   Yes, I have checked bunker temperature. It is 5 degrees (centigrade) above normal.
4. Do .....?
   Yes, I require a further generator to operate an additional pump.
5. What .....?
   Maximum temperature is 50 degrees. Do not exceed a maximum temperature of 50 degrees for the bunker oil.

f) Match.

1. take …	☐ the auxiliary pump
2. fill …	☐ soundings
3. transfer …	☐ a barge
4. operate …	☐ from No.1 tank to No.2 tank
5. order …	☐ a safe working pressure
6. keep …	☐ the pumpman
7. open …	☐ spill
8. instruct …	☐ the scuppers
9. plug …	☐ valves
10. clean up …	☐ the tank
11. complete …	☐ the oil record book

g) Write the opposites. [stop, close, exceed, decrease, disconnect]

1. Keep within ≠ .....
2. Connect ≠ .....
3. Increase ≠ .....
4. Open ≠ .....
5. Start ≠ .....

h) Reporting and cleaning up spillage: *The Chief Officer is on deck during bunkering. S/he is reporting a spillage to the bridge. Read the following exchange and fill in the missing words. Then, practise saying the dialogue in pairs.*

assist	escaping	stand by	contained

Chief Officer (on deck)	*Master (on bridge)*
Leak at manifold connection!	
	Stop pumping! Is oil …… into the sea?
No, oil is spilling on deck.	

	How much is spilled?
Spill is about 2 tonnes.	
	Has spillage stopped?
Spillage stopped.	
	…… oil clearance team and report.
Oil clearance team standing by.	
	Treat spill with oil dispersant and absorbent materials. All crew ……..….. to remove the spill.
Spill cleaned up with absorbent materials. Spill waste …….....…. in save-all.	

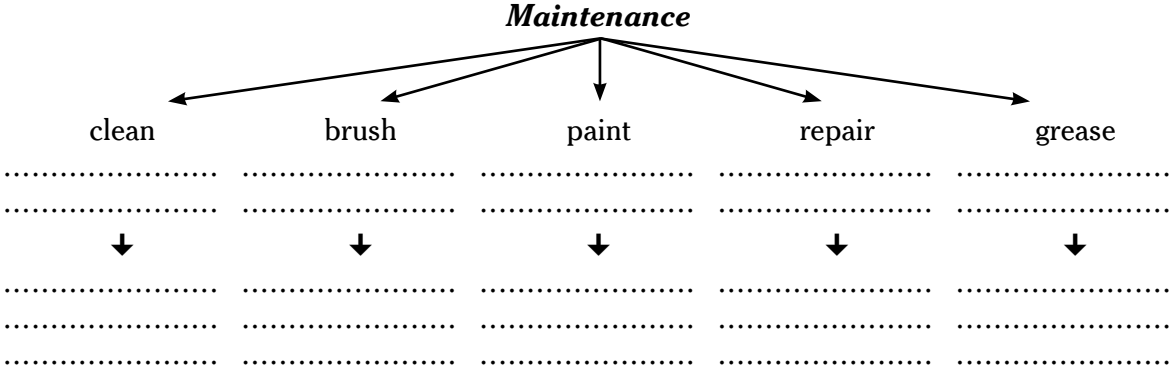
3. Maintenance duties in the deck department

Lead in:

i. The following verbs describe maintenance work on deck; write them in the correct list for similar duties below:

Scrape off	Wash	Oil	Service	Lubricate
Sweep	Chip off	Fix	Cover	Coat

ii. What tools do you use to do the duties? Choose them from the tool box below and write them under each arrow.



roller	painting brush	lube oil/grease applicator	brushes	broom	mop
wiping rags	scraper	chipping hammer	abrasive brush	various workshop tools	

iii. Match:

1. scrape	the railings
2. paint	the rust off the hatch covers
3. grease	~~the fork-lift truck~~
4. service … *the fork-lift truck*	the surface to prepare it for painting
5. brush	the winches

I. Mooring line care

a) You are going to listen to a short presentation on mooring line maintenance[1]. Imagine you are keeping the following notes. First try to guess the missing words, then listen to see if you were right.

Mooring line care and maintenance

If the mooring rope is _____, it can break. To prevent the line from _____ (dividing into parts), you should maintain ropes to keep them in a good condition.

The visual inspection of mooring rope and mooring wire is important.

- The wear along the rope should be examined. You should _____ the worn end of the rope.
- You must _____ worn mooring wire and replace it.

Rope care:

- You should not let fibre ropes exposed to sunlight while at sea; you should _____ fibre ropes, or store them below deck.
- You should dress wire ropes with an appropriate _____ to maintain their condition.

b) Cross out the odd one of the highlighted words (two are correct, one is not).

You must ***search / examine / inspect*** the mooring rope. Any signs of ***wear / damage / erosion*** are dangerous, because mooring rope can ***break / part / spoil*** and cause accidents. In any case, you need to prevent deterioration through good maintenance; you should protect it from sunlight and make sure you ***crack / cut out / crop*** the worn parts, also ***oil / grease / wet*** wire rope to keep it in a good condition. In certain cases, it may be necessary to ***replace / rebuild / renew*** the mooring line all together, following special discard criteria.

II. Painting

Lead in: Check what you know.

i. Discuss in class:

Have you done any painting while working on board?
How did you prepare the surface before painting? What tools did you use?
What methods are used for painting / cleaning on board?
in dry dock?
in manufacturing (shipbuilding)?

1. For more information see Loss Prevention Bulletin, Dec 2009, Risk Alert on "Mooring Line Care and Maintenance.

ii. Keywords

Choose one word you know and explain to class what it means. Then the next student takes over until the list is all crossed out. You can pass if the remaining words are unknown to you.

e.g. *Shot-blasting is to clean or strip a metal surface by directing a high speed stream of steel particles at it.*

Chipping hammer / corrosion / paint layer / coating / tank coating / pre-treatment / dry-blasting (~~shot-blasting~~, grit-blasting, sand-blasting) / brush / roller / spray / surface / primer / rust

Painting [2]

Pre-treatment
For a good painting result it is important that the steel that is going to be painted is pre-treated. The better the material is cleaned, the better the result will be. Pre-treatment also offers protection to the material. The base material can be cleaned in the following ways:

- With hand tools
- Mechanical cleaning (with machines)
- Chemical cleaning (especially degreasing)
- Thermal cleaning
- Sandblasting / gritblasting
- Waterjets

Hand tools: manual cleaning is done with scaling hammers, scrapers, sand paper and wire brushes. This method is very labor-intensive.	***Mechanical cleaning*** is done with mechanical scaling hammer, rotating wire brushes, abrasive wheels and abrasive discs. On board, needle-scaling hammers or chipping hammers are used almost exclusively. Of all the types of mechanical scaling hammers, this is one of the best, although it is not very fast. The roughened surface gives a good anchoring for the paint layer. Almost all methods of cleaning with mechanical devices require breathing and hearing protection.	***Chemical cleaning*** removes the old layer of paint and rust. For local paint jobs, paint-stripping compounds are used. In manufacturing, the cleaning is done with acids. In all cases the cleaned material should be thoroughly rinsed with fresh water.
Thermal cleaning: for local removal of paint, a heat paint stripper can be used. The heat softens the paint, which can be removed by tools. The paint stripper is not used on a large scale because of the fire-hazard and the toxic vapors that are released upon heating.	***Water washing*** (called "Hydroblasting" when using pressure of more than 700 bars) is used in drydock. The installation consists of a high-pressure pump, hoses and a gun. Water washing is very successful in removing salt deposits, loose paint and algae.	

2. Source of text and pictures: Ship Knowledge 5th ed., Chapter 14: Materials and maintenance, pp. 320-322.

Gritblasting is done by blasting granular materials at high speed with high-pressure air against the steel. The material is cleaned thoroughly and the surface is roughened, which is essential in order to achieve a good mechanical bonding with the coating. ***Sandblasting*** is applied in some cases (but it is no longer allowed in some countries due to health [lung] problems). Gritblasting is not done on a large scale on board because it requires special equipment (for instance, a portable grit blaster consisting of an air compressor and hose). It can be done in drydock, because this method is suitable for treating large areas (20 m^2 per hour is feasible).

Applying the paint layer

Before the paint is applied one has to make sure that

- the surface is clean of moisture, dust and grease.
- the paint is stirred well before use.
- The correct tools are being used: *brush, roller or spray*.

Types of paint: *finish paint, primers*

- Primers are the base for the final paint layers.
- Finish paints are the final coatings and include anti-fouling paint.

a) Write the correct title under each picture.

High pressure water washing / Manual cleaning with a scraper / Using a rotating wire brush / Local gritblasting / Mechanical cleaning with a pneumatic scaling hammer

Pre-treatment / Cleaning

(a)

(b)

(c)

(d)

(e)

Glossary

labour intensive	(of work) needing a lot of people to do it
granular	consisting of small grains or particles
feasible	that is possible and likely to be achieved, practicable

algae	very simple plants, such as seaweed, that have no real leaves, stems or roots, and that grow in or near water
grit	small loose particle of stone or sand
rinse	to wash (something) with clean water to remove dirt, impurities, detergent, etc.
stir	to move a liquid around, using a spoon or something similar, in order to mix it thoroughly
scale (n)	a hard white deposit formed by the evaporation of water (inside water pipes for instance), scale (v): to remove the scale

b) Look at the pictures and write the correct title under each picture.

Paint-spraying	Painting the deck with a brush	Applying paint with a roller

Tools for applying the paint layer

(a)  (b)  (c) 

III. Permit-to-work

a) Read the Permit-to-Hot Work and fill the following information in the appropriate spaces.

E/R Workshop	08.00 – 16.00 (8 hours), 09/07/2012	
Assistant Engineer	Fitter	Welding

Permit-to-work[3]

Work to be done _____

Period of validity of permit _____

Location _____

Person in charge of the work _____

Person performing the work _____

Responsible officer (*signature*) _____

Date _____ Time _____

Master's signature _____

Date _____ Time _____

3. Permit-to-work form from ILO Code of Practice: Accident Prevention on board ship at sea and in port.

Entry into enclosed or confined spaces

_____ Space thoroughly ventilated _____
_____ Atmosphere tested and found safe _____
_____ Rescue and resuscitation equipment available at entrance _____
_____ Responsible person in attendance at entrance _____
_____ Communication arrangements made between person at entrance and those entering _____
_____ Access and illumination adequate _____
_____ All equipment to be used is of an approved type _____
_____ When breathing apparatus is to be used:
(1) familiarity of user with apparatus is confirmed _____
(2) apparatus has been tested and found to be satisfactory _____

Machinery or equipment

_____ Removed from service/isolated from sources of power or heat ____
_____ All relevant personnel informed _____
_____ Warning notices displayed _____

Hot work

_____ Area clear of dangerous material and gas free _____ ✓ _____
_____ Ventilation adequate _____ ✓ _____
_____ Equipment in good order _____ ✓ _____
_____ Fire appliances in good order _____ ✓ _____

I am satisfied that all precautions have been taken and that safety arrangements will be maintained for the duration of the work.

Signature of person in charge: _____

b) The following phrases are from the Permit-to-work. It is important to be able to understand them. In pairs, find them in the Permit above and explain what they mean. Then, match the phrases in italics to the explanations given on the right.

i.

1. *Validity*
2. *Location*
3. Person *in charge*
4. Person *performing* the work
5. Equipment *available* at entrance
6. Person *in attendance* at entrance
7. *Communication arrangements*
8. *Adequate illumination*
9. Equipment of *approved* type

☐ Who has the responsibility
☐ Being officially and legally acceptable
☐ Place where something happens
☐ Enough light
☐ Officially found good enough to be used
☐ Carrying out, doing the task
☐ That you can get or find
☐ Preparation you make so that you can be in contact with
☐ Who is present (in order to help)

ii.

1. *Familiarity* of user with apparatus	☐ Knowing something well
2. Apparatus found *satisfactory*	☐ Separated from, kept far away from
3. *Isolated from* sources of power or heat	☐ Crewmembers related to this
4. All *relevant personnel*	☐ Good enough for a particular purpose
5. *Warning notices displayed*	☐ It works well
6. Adequate *ventilation*	☐ Put warning signs in a place where people can see them
7. Is *in good order*	☐ Allowing fresh air to enter and move around the space
8. Take *precautions*	☐ Do things to prevent problems and to avoid danger

Round-up

A. Vocabulary Consolidation Self-Assessment.

Tick ☑ what you can do. Cross ☒ what you still find hard to do in English.

- ☐ Check the completion of bunkering procedures
- ☐ Understand bunkering checklists
- ☐ Simulate VHF communications on bunkering
- ☐ Describe maintenance duties on deck
- ☐ Understand safety procedures regarding pollution prevention on board

B. Class Project.

Find out more about the bunker sample taking procedure. What do they test the sample for? How is the sample taken? Is the new bunker used before the results from the lab are received? Why is the sulphur content of marine fuels important?

C. Fill in the correct preposition:

at	in	in	of	off	upon	on	with

1. To the best _____ my knowledge.
2. Overflow _____ No.2 tank!
3. We have put fenders _____ position.
4. The main engine is _____ stand-by.
5. _____ completion of the bunkering procedure, sign the oil record book.
6. During tank change over and topping _____ it is important to monitor for oil spills on deck.
7. A damaged mooring line can strike those standing by _____ the vicinity.
8. Wire ropes should be dressed _____ an appropriate grease for maintenance.

D. Match the words to their definitions.

contingency	pneumatic	ullage	gritblasting	spill control gear	fender

1. _____: a plastic cylinder, tyre, etc. hung over a ship's side to protect it against impact.
2. _____: the empty space above the liquid contained in a tank.
3. _____: anti-pollution equipment for combating accidental spills of oils or chemicals.
4. _____ Plan: a plan designed to take account of possible future event or circumstance / emergency / incident.
5. _____: method of cleaning a surface by directing to it stone particles with high-pressure air.
6. _____ tools: tools worked by air under pressure.

E. Look at the following verbs. Make sure you know all of them. Explain what they mean and choose at least one noun from the box to match. There are many possible combinations.

the temperature	pumping	VHF contact	pumping rate
oil clearance team	the spill	a safe working pressure	the pumpman
the valves	the tank	the EOW	the pilot ladder
the bonding wire	the OOW	the auxiliary pump	absorbent materials
hoses	the oil record books	the scuppers	spill control gear

1. Fill / fill up .....
2. Exceed .....
3. Start / stop .....
4. Check .....
5. Call .....
6. Plug .....
7. Stand by .....
8. Fit .....
9. Maintain .....
10. Instruct .....
11. Connect / disconnect .....
12. Keep .....
13. Inform .....
14. Open / close .....
15. Increase / decrease .....
16. Treat .....
17. Sign .....
18. Operate .....

F. Write up the words.

1. w _ _ _ _ w _ _ _ _ _ _ : method of cleaning that offers better removal of salt deposits (and is also eco-friendly).
2. s _ _ _ b _ _ _ _ _ _ _ : in this method we clean a surface with a jet of sand driven by compressed air or steam.
3. cleaning with c _ _ _ _ _ _ _ hammer: method used on board in which the roughened surface gives good anchoring for paint layer.

G. The following text is a* Bunkering Safety Checklist Declaration*, signed by ship, barge and terminal operators (i.e. the Master, the bunker vessel Master, and the port representative). Write the Present Perfect Simple form of the following verbs. Then use them to fill in the gaps in the declaration.

satisfy ⇨ (we) .....
agree ⇨ (we) .....
make ⇨ (we) .....
check ⇨ (we) .....

DECLARATION
We (1) ....., where appropriate jointly, the items of the Checklist in accordance with the instructions and (2) ..... ourselves that the entries we (3) ..... are correct to the best of our knowledge. We have also made arrangements to carry out repetitive checks as necessary and we (4) ..... that those items coded 'R' in the Checklist should be re-checked at intervals not exceeding two hours. If, to our knowledge, the status of any item changes, we will immediately inform the other party.

H. Use the correct verb from the box below in the Present Perfect Simple to complete the sentences.

arrive / paint / sweep / forget / send / practise / finish / read / repair

1. ..... you ..... your duties yet?
2. .....you ..... the safety manual yet?
3. The vessel ..... not ..... to its destination yet.
4. The Chief Officer ..... not ..... the Notice of Readiness yet.
5. ..... the ratings ..... the fire drill?
6. The engineer ..... the main engine.
7. The deck cadet ..... the railings.
8. The AB ..... the deck.
9. The Chief Officer ..... to send the fax to the company.

UNIT 14

PLS ADV ASAP

1. *Maritime communication systems*
2. *Understanding telex messages*
3. *Requesting and giving advice*
4. *VTS Standard Phrases (IMO SMCP: A1/6)*
5. *Future events*

Round-up

1. Maritime communication systems

A. *Maritime Communication Systems: Read the following text[1] and...*

i. answer the following questions:

- What type of communication systems are required on board? What set of rules regulate these requirements?
- Do satellites offer worldwide coverage, making the used satellite communication systems possible in all areas worldwide?

ii. fill in the missing phrases.

Communication systems

According to the GMDSS rules mandatory communication systems are installed on board, like:

- VHF short range
- MF/HF in medium and long range
- Sat C long & short range

The above systems are not capable of receiving and/or transmitting data commonly used nowadays (1)..... . An upcoming trend is the use of so called V-sat terminals offering high speed communications comparable with shore based telephone systems. Due to the various satellite providers and the fact that the V-sat beams are not covering most of the oceans, there is still (2)..... in the use of this system.

External communication systems

The required ship-shore communication is related to the selected (3)..... .

- A1 is the area close to shore, within reach of the VHF coastal stations.
- A2 is the next area in size, a greater distance from shore and limited crossings, for instance in the North Sea.
- A3 is worldwide, with the exception of the polar regions, i.e. between 70° North and 70° South. The A-3 area is covered by GMDSS satellites. Ships in "Unrestricted Service" basically means all ships which make long voyages and must fulfill A3 requirements.
- A4 Inmarsat satellites cover only the A-4 area between 70° North and 70° South. The polar regions not covered by satellites require a complete, old fashioned set of radio communication equipment operating independently of the satellites.

Global Maritime Distress and Safety Systems use Inmarsat (International Maritime Satellite), a system supported by many countries. These countries (4)..... and collect dues in proportion to use. The system enables automatic communication and can be interrupted (5)..... . Various communication standards are possible. The system is based on being used by ship's nautical officers, which means that no radio officers are needed on board.

Inmarsat is the pioneer of satellite communication (6)..... . It all started with the introduction of the Inmarsat A system, followed by B, C and F. Now Inmarsat is offering Fleet broadband solutions with worldwide coverage and high speed services. Worldwide coverage is offered (7)..... the polar regions.

1. From *Ship Knowledge*, pp. 178-9, 310.

Due to the upward trend in providing high speed solutions to the marine industry, the vessels are becoming virtual offices worldwide linked to the main computer (8)..... of the shipping companies.

to the maritime industry	like the high speed ADSL type ashore	operation area
at the head office	in case of emergency and distress messages	a limitation
finance the system		with the exception of

B. ***Fill in the words in the following advertisement of a GMDSS A3 Radio Station.***

subscriber	replay	reliable	missed	tough

- ***Inmarsat C:***

  The Inmarsat Mini C (incl. LRIT) offers fast, (1)..... connections to any fax and data (2)..... worldwide and/or directly to and from another Inmarsat Mini C unit. It supports all Inmarsat communication modes, including telex, X.25, e-mail, SMS and mobile-to-land fax services. The operation and control is done via the 10.4 inch message terminal / keyboard. Option: SSAS functionality kit.

- ***MF/HF Radio telephone:***

  150 W, 250 W or 500 W MF/HF radio telephones for professional communication with voice, DSC and radio-telex (option for 150 W and 250 W) into one unit. The new MF/HF radio can store and (3)..... incoming calls like the VHF radio up to 240 seconds. They have been designed and developed to cope with demands for reliable communication equipment under the (4)..... conditions at sea.

- ***VHF Radio telephone:***

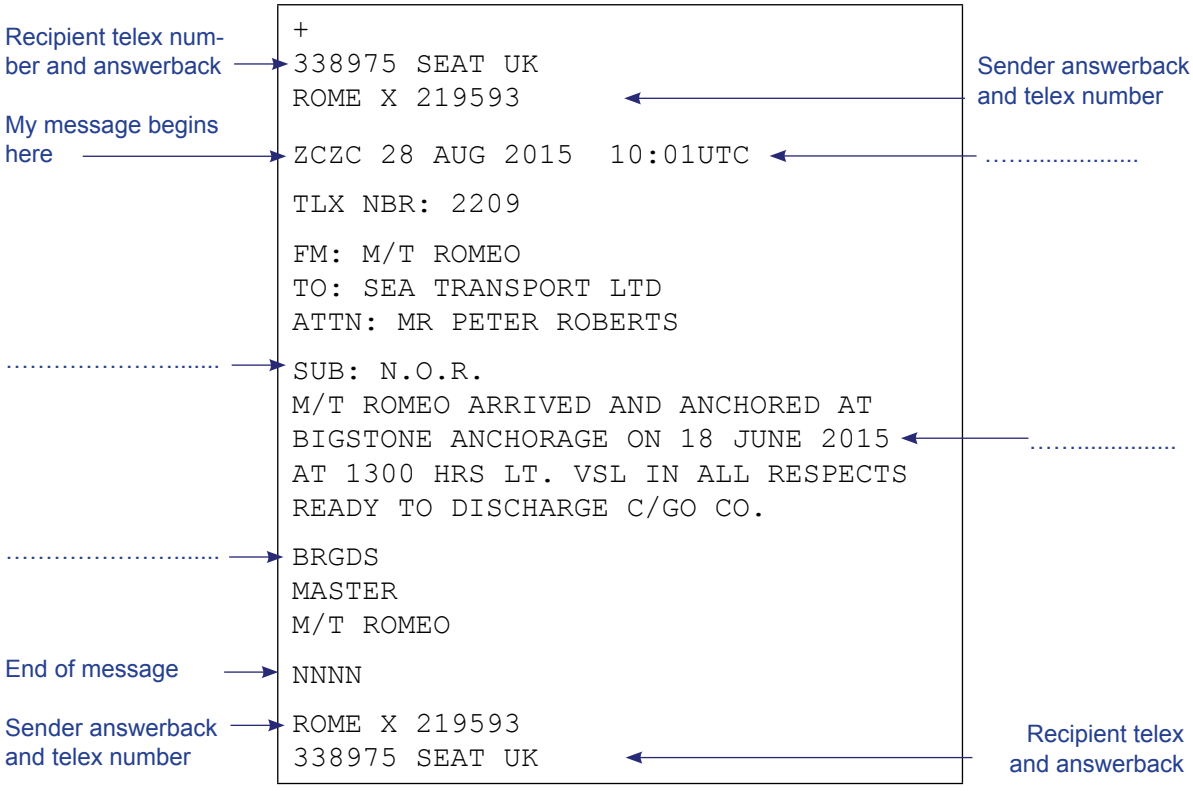
  The 6222 VHF DSC is a VHF DSC Class A for the professional maritime market. The VHF can store and replay incoming calls. Safety at sea is increased as a (5)..... message can simply be heard again. Alarm muting button, large tactile buttons and tactile knobs for volume are standard features of the GMDSS A3 Station.

2. Understanding telex messages

I. Telex abbreviations / format

a) Look at the telex below. Locate the following key information in the telex.

- Which arrow shows ***the message, the date and time, the sign off, the subject***? Write them in the appropriate space.
- Who wrote the telex?
- Where was the telex sent from?
- Which company is the telex for?
- Which person is the telex for?



People who are involved in the maritime business have to learn the art of decoding texts (like documents, telexes, manuals), which convey information in a condensed form. There are no standardized conventions for telex messages but generally we note two points:

1. In telex messages we use many short forms of words (abbreviations or acronyms). Generally, here are some of the conventions used in the making of abbreviations:

• words without endings: CAPT – CAPTAIN	• missing vowels: ABT – ABOUT	• words commonly used: TKS – THANKS
• words written together: DDOCK – DRY DOCK	• documents: C/P – CHARTER PARTY	• maritime terms: VTS – VESSEL TRAFFIC SERVICE

b) Match the full forms to their abbreviations (you can first try to guess the abbreviations yourself, then match with the help of the list given in the box below).

1.	Telex number	18.	Advise
2.	Vessel	19.	Best regards
3.	Pilot station	20.	Destination
4.	With reference to your telex	21.	Automatic identification system
5.	In vicinity of	22.	Approximately
6.	Reference number	23.	As soon as possible
7.	Perishable cargo	24.	Dimensions
8.	Net weight	25.	Discharge
9.	Container	26.	Motor tanker
10.	Captain	27.	Motor vessel
11.	Bulk carrier	28.	Notice of readiness
12.	Documents	29.	For the attention of
13.	For your information	30.	Missing cargo
14.	For your reference	31.	Estimated time of departure
15.	Miscellaneous	32.	Estimated time of arrival
16.	From	33.	Reference
17.	Weather and safe navigation permitting	34.	Port of call

FM MISC. NT.WT. TLX NBR REF BLKCAR APPROX
NOR WSNP FYR PS RF.NO. FYI ADV DIMS
ASAP M/T ATTN DOCS CAPT MV VSL PER
CTNR POC ETD BRGDS AIS DEST DISCH
RYT INVOF MSCA ETA

c) What do the following abbreviations / acronyms mean? Fill in the words in the box next to the appropriate abbreviation.

HOUR LOCAL TIME NUMBER MESSAGE DISTANCE OPERATIONS
THANKS CHARTER PARTY DEPARTURE ARRIVE SORRY DEPARTMENT
ESTIMATED AMOUNT PLEASE ALONGSIDE HIGH TIDE REVERT
FOLLOWING NAUTICAL MILES YOUR TEMPERATURE ABOUT COAST GUARD

1. PLS – .....
2. DIST – .....
3. HT – .....
4. MSG – .....
5. NO., NR, NBR – .....
6. C/P – .....
7. SRY – .....
8. EST – .....
9. ARR – .....
10. TEMP – .....

11. NM – .....
12. TKS – .....
13. HR – .....
14. LT – .....
15. ABT – .....
16. DEP – .....
17. CG – .....
18. A/S – .....
19. DEPT – .....
20. AMT – .....
21. FLWG – .....
22. YR – .....
23. OPS – .....
24. RVRT – .....

d) Write the abbreviation yourself.

1. RECEIVED –
2. CERTIFICATE –
3. AROUND –
4. JANUARY –
5. NEW YORK –
6. LONGITUDE –
7. BETWEEN –
8. BILL OF LADING –
9. AVERAGE SPEED –
10. TOMORROW –
11. STARBOARD –
12. BAROMETER –

2. The message in a telex is very short and simple. Not only are ***words*** made shorter by using abbreviations, but also ***sentences*** are made shorter by using only important words. This means that certain types of words are missing.

Message in telex form:		*Full message:*
VSL IN ALL RESPECTS READY TO DISCH C/GO CO	➜	**THE** VESSEL **IS** IN ALL RESPECTS READY TO DISCHARGE **ITS** CARGO **OF** CRUDE OIL

As you can see in the example above, the types of words that are omitted include:

- THE; *articles (the, a, an)*
- ITS; *personal pronouns (I, you…)*
- IS; *verb "to be" (am, is, are)*

e.g. **~~I~~ suspect ~~a~~ serious injury → SUSPECT SERIOUS INJURY**

~~The~~ distance ~~is~~ 30 NM → DIST 30 NM

e) Write these sentences in telex form. Use only important words, short sentences and abbreviations where possible.

1. Thanks, your message has been received.
   .....
2. I will revert with the amount of missing cargo.
   .....
3. I am sorry for the delay. The documents will be delivered as soon as possible.
   .....
4. The ship's estimated time of arrival is at 3 o'clock in the afternoon local time on Saturday 23rd.
   .....

5. We estimate the delivery amount to be 700 tonnes.
   .....
6. Our departure time is at 8 o'clock in the evening.
   .....
7. The estimated distance travelled on Monday the 16th of Nov was 240 nautical miles.
   .....
8. Please advise us of the number of the berth.
   .....
9. There is a problem with the engine.
   .....
10. For your information, the following crew members requested repatriation from the discharging port of Rotterdam.
    .....

f) Turn the following telex messages into full sentences.

1. 1 CTNR ON FIRE
   .....

   .....
2. TKS FOR YR TLX TODAY
   .....

   .....
3. ETA ESPERANCE PS 09 AUG 1200 HRS LT WSNP
   .....

   .....
4. FM: OPS DEPT
   .....

   .....
5. SOON WILL RVRT WITH AMT OF PROVISIONS TO BE DELIVERED AT NEXT POC
   .....

   .....
6. PLS SUPPLY FLWG NEW EDITIONS OF CHARTS AND PUBL
   .....

   .....
7. FLWG CREW MEMBER REQUESTED REPATRIATION FM DISPORT PHILADELPHIA WHERE ETA ABT 22 NOV: MAVRIDIS PARIS, CHMATE
   .....

   .....

II. Producing telex messages

a) The subject of the telex is noted as SUB (SUBJECT) or REF (REFERENCE). What is the subject of each message below? Choose from the following.

ETA, NOR, REPAIRS, NOON POSITION REPORT, ETD

1. **SUB:** …….
   VSL BERTHED DAMPIER 25 JUL NOON.
   ETD 26 JUL EARLY MORN.

2. **SUB:** …….
   MV VENOM ARRIVED AT ROTTERDAM NO.3 ANCHORAGE AND IS IN ALL RESPECTS READY TO DISCHARGE HER CARGO OF COAL 120,800 MT IN ACCORDANCE WITH TERMS, CONDITIONS AND EXCEPTIONS OF THE GOVERNING C/P.
   PLS ADVISE ALL PARTIES CONCERNED ACDGLY.

3. **SUB: …….**
   ETA PHILADELPHIA 09 JUN 16:00 LT.
   PLS ARRANGE TECHNICIANS TO BOARD VSL ON ARRIVAL TO EFFECT BRIDGE CONSOLE REPAIRS.

b) Purpose of a telex: What is the purpose of the Master's telex below? Tick accordingly.

The master is....

☐ asking for information ☐ asking for advice
☐ giving information ☐ giving advice

```
8947289 DRUM PR
OCEAN T 1248709

ZCZC 18 JAN 2015 08:00 UTC

TLX NBR: 1008

FM: MV OCEAN TRUCE
TO: DRUM SHIPPING, PIRAEUS
ATTN: FOTEINI FOTSI, MEDICAL CARE DPT
CC: DR MOORE

SUB: SERIOUS INJURY

BOSUN BADLY INJURED.
SUSPECT BROKEN LEG. INJURY RECD DURING UNMOORING
OPERATIONS SAT 17 JAN ABT 1200 LT.
BOSUN UNABLE TO MOVE AT ALL AND IN GREAT PAIN.
HAVE GIVEN MEDICATION.
PLS ADV ASAP.

RGDS
MASTER
OCEAN TRUCE

NNNN

OCEAN T 1248709
8947289 DRUM PR
```

c) This is the reply from Dr. Moore to the Master of the Ocean Truce. The doctor wrote his reply as a letter. What advice does he give the master?

The Master, Ocean Truce
18/01/2015

Dear sir,

Thank you for your telex regarding the Bosun which I received today. After careful consideration, I would advise you to alter course for Piraeus as soon as possible.

You should get the injured man ashore as soon as possible. He needs to have an X-ray and be examined by a doctor. In the meantime, I advise you to make the patient comfortable. He must not move. You should use a splint to immobilize the injured leg. You should also continue to give him painkillers until we see him.

I can meet you when the vessel is alongside in Piraeus. I will arrange for an ambulance to meet us for transfer to the nearest hospital.

Please advise the agent in Piraeus to contact me with the estimated time of arrival.

Best regards,
Dr. Moore

d) Change the doctor's letter into a telex. Make all the necessary changes (use abbreviations, omit words you think are not needed, etc.).

FM: ……
TO: ……

SUB: ……

……
……
……
……
……
……
……
……
……
……
DR. MOORE

e) What is the purpose of each of the following telex messages? What does each message do? Circle the correct choice (sometimes more than one is applicable).

1. PLS MEET SURVEYOR AT AIRPORT
   a. gives information *b. gives an instruction* *c. asks for information*

2. I HAVE CONFIRMED AGENTS WILL MEET SURVEYOR AT AIRPORT
   a. gives information *b. gives an instruction* *c. gives advice*

3. AGENTS WILL CONTACT YOU SHORTLY
   a. gives information *b. gives an instruction* *c. asks for information*

4. SUPERINTENDENT WILL ARRIVE ON MONDAY. ESSENTIAL YOU WAIT FOR SUPERINTENDENT AT SINGAPORE
   a. gives information *b. gives an instruction* *c. asks for advice*

5. WE RECEIVED CONSUMABLES MONDAY TKS
   a. gives information *b. gives advice* *c. makes a request*

6. PLS ARRANGE FOR PILOT
   a. gives information *b. gives advice* *c. makes a request*

7. MOST URGENT I RECEIVE YR REPORT TMR 17:00 UTC LATEST
   a. gives an instruction *b. gives advice* *c. asks for advice*

8. SHOULD GET BOSUN ASHORE
   a. gives information *b. gives advice* *c. asks for advice*

9. PLS ARRANGE DELIVERY OF STORES AND PROVISIONS
   a. gives an instruction *b. gives information* *c. asks for information*

10. REQUIRE ON ARRIVAL SOUTHAMPTON SURVEYOR OF CLASS TO CARRY OUT ANNUAL SURVEY OF CARGO GEAR. ETA SOUTHAMPTON 18 MAR 14:00 LT WSNP.
    a. gives information *b. makes a request* *c. asks for advice*

11. PLS KINDLY ADVISE THE AREA LIMITS BEYOND WHICH WE ARE NOT ALLOWED TO PUMP OUT ANY BALLAST
    a. asks for advice *b. gives advice* *c. gives an instruction*

12. MR D. GEORGIOU, 2ND ENGR, IS SUFFERING FROM FOOD POISONING WHICH TOOK PLACE ASHORE. PLS ADV ASAP
    a. asks for advice *b. gives information* *c. asks for information*

13. PLS REVERT WITH YOUR BUNKER REQUIREMENTS IN MANILA BASIS BUNKERING TO SAFELY REACH AUSTRALIA WITHOUT BUNKERING
    a. gives information *b. asks for information* *c. gives advice*

14. TURBOCHARGER DAMAGE. REQUIRE TECHNICIANS TO DISMANTLE TURBOCHARGER AND INSPECT
    a. gives information *b. makes a request* *c. asks for advice*

15. SHOULD ARRANGE FOR DOCS TO BE DELIVERED BY COURIER
    a. gives information *b. asks for information* *c. gives advice*

f) Put the following parts of the telex in their correct place. Write one in each box.

6783543 NSRA UK CRON X 098908
RGDS
NNNN CRON X 098908 6783543 NSRA UK

- TLX NR: 986
- TO: MANAGERS
- ATTN: MR. SMITH
- MASTER
- ~~RGDS~~
- FM: M/V CRONE
- CC: OPERATIONS DEPT
- SUB: FIRE AND EXPLOSION
- ZCZC 09-08-2015 11:01 UTC
- FIRE AND EXPLOSION FORECASTLE PAINT STORE-ROOM. LOST FORECASTLE WATERTIGHT DOOR STRBD SIDE. FIRE NOW EXTINGUISHED. PAINT LOST AT SEA. TWO NON SERIOUS INJURED. VESSEL SEAWOR-THY. NO FURTHER ASSISTANCE REQUIRED.

g) The following telex is the answer from the managers. What do the managers want?

```
FM: MANAGERS
TO: MASTER M/V CRONE

RYT REGARDING FIRE AND EXPLOSION IN PAINT STORE ROOM PLS
ADV:
A/ CAUSE OF INCIDENT AND DETAILS ABT THE INJURIES
B/ FIRE EXTINGUISHER CHARGES TO BE REPLACED
C/ DETAILS REGARDING THE PAINT LOSS

RGDS
MR. SMITH
```

The following telex is the answer sent by the Master:

```
FM: M/V CRONE
TO: MANAGERS

INCIDENT CAUSED BY NON REPAIRED FLAME PROOF LIGHT
FOR TWO INJURED (A/B IVAN AND FITTER ILLYA) GIVEN
MEDICAL ASSISTANCE, CONDITION GOOD. VESSEL SEAWORTHY.
PROCEED TO ANTWERP FOR DISCHARGING.
3 CO2 CHARGES REQUIRED
EST LOSS AT SEA 320 LITRES OF PAINT. OUTFLOW NOW
STOPPED. COASTAL AUTHORITIES HAVE BEEN NOTIFIED.

BRGDS
MASTER
```

h) TELEX

Today, the vessel JASON is in position approximately 2 nautical miles north-east of Buoy B4, in the Dubai Fairway. One A/B, named Tabuno Tani, has cut his hand with the electric chipping hammer and has severe bleeding. Send a telex, on behalf of the Master, Captain John Landis, to the local agent (for the attention of Mr Tracy), and ask for assistance. Decide on the kind of assistance you will require and mention it in your telex. Also, mention your estimated time of arrival in Dubai.

3. Requesting and giving advice

A. ***Study the following VHF communication between a VTS Radio Station and a vessel and complete the missing words. Then practise saying the dialogue in pairs.***

intention / permission / advice / closed / use / information

Vessel	*VTS Station*
REQUEST. Do I have ……. to enter the roadstead?	
	……. Route from roadstead to entrance of fairway suspended. Navigation ……. in the outer traffic lane.
QUESTION. What do you advise?	
	ADVICE. Advise you ……... the inshore traffic lane.

……. I will enter the inner fairway.	
	…….. Keep a track parallel with reference line.

B. ***Note the use of "the" in the dialogue. Are there any places in the dialogue where we could use "the" and it is omitted?***

Note: Remember, sometimes we omit "the" in the SMCPs.
e.g. I cannot control ~~the~~ flooding. I have problems with ~~the~~ engines.

Asking for / offering advice

PLS ADV ASAP: Please advise as soon as possible.

to *advise* is to offer advice, to counsel.
advise (verb): *Can you advise me please?* / advice (noun): *I need some advice*.

When you speak you can **ask for** advice in the following ways:
- What should I do?
- What do you think I should do?
- Can you advise me please?
- What do you suggest?
- What do you recommend?

Here are some ways you can **offer** advice:
- You should apply a splint to the injured leg.
- I think you should check the pressure.
- I would advise you to alter course.
- I suggest that you send him ashore.
- I recommend that you give him painkillers.

C. ***Write an answer offering advice. Use the words in brackets.***

1. My stomach hurts, what do you think I should do?
……. (take some medicine)
2. Which tool should I use?
……. (use the spanner)
3. What route do you suggest?
……. (take the canal route)
4. Can you advise me on the best approach?
……. (approach from the southwest)
5. I have a terrible toothache. What do you recommend?
……. (go to the dentist)

D. ***Look at the questions and answers below. Complete each conversation using the phrases for asking for and giving advice in the table on page 319.***

3rd Engineer:	➔ ***Chief Engineer:***
There isn't enough pressure in the fuel line. Can ……., Chief?	I would ……. check the line for leaks.
What ……., Chief? The auxiliary generator isn't running smoothly.	You should ask the electrician to check it.

Deck cadet:	➔ ***Chief Officer:***
I don't know how to print out the telex messages. What do you think I should do?	Well, I ……. look at the manual.
The Bosun told me to clean the old paint, but I don't know which tool to use. What ……?	I suggest you use the abrasive brush.

E. ***Read these situations and write your advice.***

I strained my back yesterday and it hurts when I make certain movements. I have to go to work. What do you think I should do?	➔ I …..
Help! The Assistant Cook is lying on the galley floor! The air smells of smoke! What should I do?	➔ You…..
Careful! There's oil and grease on the floor of the engine room! What do you suggest?	➔ I …...
Captain, this is the bridge. The approaching vessel is asking us to alter course. What do you recommend?	➔ I …...

4. VTS Standard Phrases (IMO SMCP: A1/6)

A. ***Match the questions to the answers. Draw arrows.***

- Are you on even keel?
- Are you underway?
- Do you have any deficiencies?

No, I am anchored.
Yes, I am constrained by draught.
No, I am trimmed by the head.

B. *Say the following using the SMCPs.*

Student A: Rephrase the sentences according to the SMCPs. Don't forget the message marker.

Student B: Look at the list of phrases on page 496 to check if your study partner says them correctly. Put a tick ☑ for all the correct standard phrases s/he is using. Help your partner find the exact phrases by suggesting ways to correct them.

⇨ Ask the direction they are approaching from.
⇨ Ask which port they are going to.
⇨ Inform them that you are going inside the fairway.
⇨ Tell them they should keep their course as it is.
⇨ Tell them you need two tugs.
⇨ Warn them that there is a reef whose position is not charted on the charts in area around buoy 18.

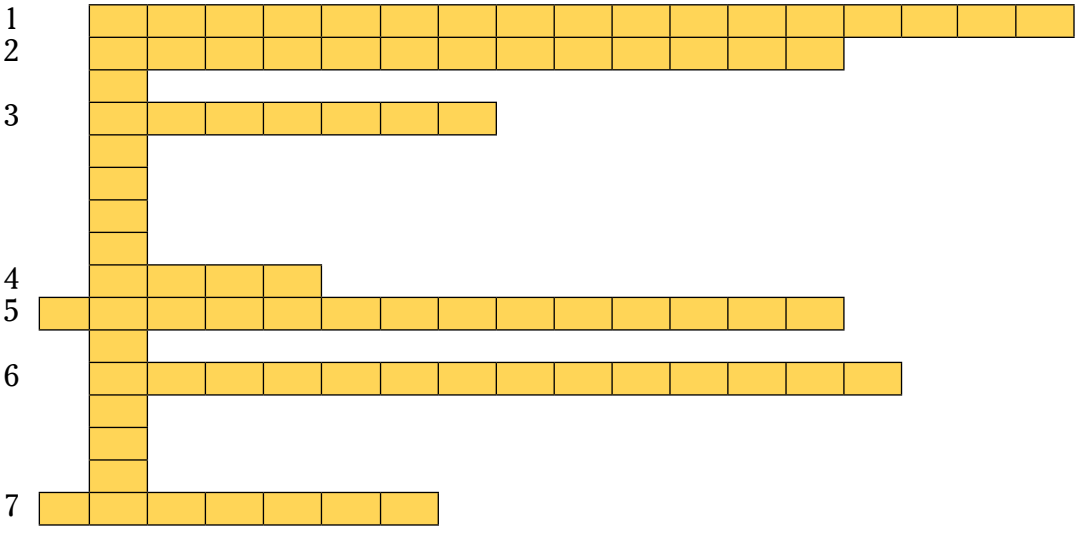
C. *VTS special terms: Make sure you know the VTS special terms in the word puzzle.*

(Across)

1. TSS: _____ _____ Scheme; a routeing measure aimed at the separation of opposing streams of traffic by appropriate means and by the establishment of traffic lanes. (2 words)
2. It is displayed on the radar screen in electronic navigation charts and VTS centres and separates the fairway for inbound and outbound vessels so that they can safely pass each other. (2 words)
3. Navigable part of a waterway.
4. Traffic _____: an area within defined limits in which one-way traffic is established.
5. A mark or position at which a vessel is required to report to the local VTS to establish its position. (2 words)
6. A mark or place at which a vessel comes under obligatory entry, transit, or escort procedure. (2 words)
7. VTS: Vessel Traffic _____ (designed to improve the safety and efficiency of vessel traffic and to protect the environment).

(Down)

VTS authorization for a vessel to proceed under conditions specified. (2 words)



D. *Use words from the word puzzle to fill in the gaps below.*

1. Do not enter the inshore _____ _____.
2. You are off course. Your track is diverging from the _____ _____.
3. You have permission to enter the _____ at 1800 – _____ _____ granted.
4. Do not pass your next _____ _____. Remain there until you receive further traffic information.
5. Icebreaker will escort you. Wait for icebreaker at _____ _____ near Buoy no. 22.

E. *Match the words to form correct collocations.*

1. Fairway	gear
2. Submerged	~~speed~~
3. Shallow	wreck
4. Tug	water
5. Slack	services
6. Fishing	approach
7. Transit .... speed	tide

F. *The following SMCP phrases are normally transmitted from the shore. Put them under the correct heading.*

Navigational warnings	***Traffic information***	***Hydrographic information***	***Meteorological information***
Course	***Enforcement***	***Berthing***	***Canal & lock operations***

- Wind is veering and increasing.
- You will join convoy at 1350 hours UTC. Your place in convoy is number 3.
- Unlit derelict vessel adrift in vicinity of buoy C8.
- You are not keeping to the correct traffic lane. Your actions will be reported to the Authorities.
- Large vessel is crossing west traffic lane.
- Your track is parallel with the reference line.
- Your vessel is in position – make fast.
- A tide of 2 metres above datum is expected in your position.

G. *Match the halves to make full sentences.*

1. Charted depth has increased....	☐ is required before entering.
2. Traffic clearance....	☐ by 3 metres due to sea state.
3. Report....	☐ are not visible.
4. Visibility....	☐ to get underway.
5. Your navigation lights....	☐ at the next waypoint at 1700 hours UTC.
6. Be ready....	☐ the fairway.
7. You are obstructing....	☐ is reduced by rain.

H. *Fill in the gaps with the words in the box.*

embark	heaving	issued	steering
sufficient	lost	expected	reach

1. I have _____ radar contact.
2. I require navigational assistance to _____ the traffic lane.
3. Gale warning was _____ at 1500 hours UTC starting at 1700 hours UTC.
4. You are _____ a dangerous course.
5. Abnormally high tides are _____ in your position at 1200 hours UTC.
6. Have your crew on stand-by for _____ up anchor when the pilot embarks.
7. The depth of water is not _____ in your position.
8. The pilot cannot _____ due to poor visibility.

I. *Fill in the missing prepositions.*

back	with	of	at	for	from
to	on	on	on	below	into

1. You are not complying _____ traffic regulations.
2. I am approaching _____ SE.
3. Say again your position. I cannot locate you _____ my radar screen.
4. You are running _____ danger. Bridge is defective.
5. The tide is 2 meters _____ prediction.
6. Vessel _____ opposite course is passing _____ the West of you.
7. You must drop _____ from the vessel ahead _____ you.
8. You are _____ anchor in a wrong position.
9. MV Pride is _____ fire in position 44° 30' N, 042° 52' E. Stand by _____ assistance.

J. *Explain the following key words found in COLREGs and then use them to fill in the gaps.*

cross	on opposite course	ingoing vessel
overtake	stand on	outgoing vessel

1. Warning. MV Dante is entering the fairway and is not under command. I repeat. _____ vessel not under command.
2. Instruction. _____ as you are approaching the limit of the fairway. _____ vessel will _____ to the west of you.
3. Do not _____ the fairway.
4. Disabled vessel _____ from you. Pass NW of disabled vessel.

K. *Anchoring instructions. Try to guess the missing words.*

1. You must anchor clear of fairway. Anchoring is p _ _ _ _ _ _ _ _ d inside the fairway.
2. You must h _ _ _ e up anchor.
3. Are you d _ _ _ _ _ _ g anchor? *(two possible answers)*

L. *Match to create warnings / instructions.*

1. Keep _____ .	overtake
2. Navigate _____ .	clear
3. Avoid _____ .	with caution
4. Do not _____ .	this area
5. Get _____ .	underway

M. *Fill in the correct derivatives.*

1. _____ prediction for area BA21 is as follows: ... [TIDE]
2. Proceed to the emergency _____ . [ANCHOR]
3. _____ mine adrift in vicinity of your position. [HAZARD]
4. Dangerous _____ reported in your position marked by yellow and black buoy. [OBSTRUCT]
5. Warning. _____ object in position 44° 30' N, 042° 52' E. Navigate with caution. [KNOW]
6. Oil _____ operations near MT STATE in position 44° 30'N, 042° 52' E. Wide berth requested. [CLEAR]

Note the meaning and use of the following useful phrases:

Wide berth requested.

(= keep a safe distance)
e.g. Pipeline is leaking gas in position... Wide berth requested.

Do you have any deficiencies?

(= a failure or shortcoming)

e.g. "Do you have any deficiencies?"
"Yes, I have the following deficiency: I am constrained by draught."

Also, ***"Do you have any restrictions?"***
(= a limiting condition or measure, especially a legal one)

N. *Do you know what the following verbs mean? Look at the example phrases and match the verbs in bold to their meanings.*

- Your track is **diverging** from the reference line.
- Stand on, you are now **converging** to the agreed route.
- Do you require a pilot?
  No, I do not require a pilot – I am holder of Pilotage Exemption Certificate.
  You are **exempted** from pilotage. You have permission to proceed by yourself.
- Tug services have been **suspended** until 1200 hours UTC.
- Tug services have been **resumed**. How many tugs do you require?
- Buoy A2 in position 44° 30' N, 042° 52' E **discontinued**.

1. _____ to separate and go in different directions
2. _____ to come from different directions and meet at a point
3. _____ to stop something for a time; temporarily prevent from continuing, defer or delay (a service, an operation, etc)
4. _____ an activity begins again or continues after an interruption
5. _____ to stop providing some service that was provided on a regular basis
6. _____ to give/get official permission not to do something (that you would normally have to do)

O. *Berthing instructions: Try to guess the missing words.*

1. Your o _ _ _ _ s are to berth on berth 77.
2. You have p _ _ _ _ _ _ _ _ n to proceed at 1900 hours UTC.
3. Berthing has been d _ _ _ _ _ d by 2 hours. Your berth will be c _ _ _ r at 2000 hours UTC.

P. *Canal and lock operations: Choose the correct alternative.*

1. You must ***close up / close down*** on the vessel ahead of you.
2. You must wait for lock ***permission / clearance*** at 1200 hours UTC. You will enter lock at 1230 hours UTC.
3. ***Transit / Transfer*** will begin at 1800 hours UTC. ***Convoy / Ship-line*** must moor at position clear of the canal entrance.

Q. *Choose the correct alternative of the words in bold.*

1. According to my radar, your course does not ***fulfil / comply with*** rule 10 of the COLREGs.
2. Have all navigational instruments ***in operation / in service*** before entering this area.
3. Your present course is too close to ***ingoing / entering*** vessel.
4. ***Recover / Recall*** your fishing gear. You are fishing in the fairway.
5. You are ***approaching / advancing*** a prohibited fishing area.
6. GPS Satellite 4 unusable from 1300 to 1500 hours UTC. Cancel one hour after time of ***restoration / return***. *[= this warning will not be in effect one hour after the system is operational]*
7. Uncharted reef ***depicted / located*** in position 44° 30' N, 042° 52' E.
8. Navigation ***closed / shut*** in area South Estuary.
9. Salvage operations in position 44° 33' N, 042° 53' E. Wide ***space / berth*** requested. Contact via VHF channel 14.
10. Stand by on VHF channel 12 until pilot ***transfer / transport*** is completed.
11. Pilotage has been ***suspended / postponed*** until 1300 hours local time.
12. Pilotage has been ***restarted / resumed***. You have permission to wait for the pilot at Buoy no. 17.

R. *Avoiding dangerous situations: Fill in the missing words.*

approach	remain	progress	proceeding
caution	roadstead	wide	danger
overtaking	deviating	cross	leaving

1. It is dangerous to _____ in your present position.
2. Large vessel is leaving the fairway – keep clear of the fairway _____.
3. Nets without buoys in this area – navigate with _____.
4. Vessels must keep clear of this area. Search and rescue in _____.
5. Your present course is too close to the vessel that you are _____.
6. Your course is _____ from the radar reference line.
7. You are running into _____; shallow water to the SE of you.
8. You are _____ at a dangerous speed. You must stay clear of the fairway.
9. You must wait for MV TRINIDAD to _____ ahead of you.
10. You must wait for MV TRINIDAD to clear before _____ the berth.
11. Cable operations by MV GROAN in vicinity of your position. _____ berth requested.
12. Small fishing boats in area around _____ – navigate with caution.

S. *Pilot request: Write the questions.*

1. .....?
   Yes, you must take a pilot – pilotage is compulsory.

2. ..... ?
My ETA at Piraeus Pilot Station is 1200 hrs local time.

3. ..... ?
My distance from Piraeus Pilot Station is 3 nautical miles.

4. ..... ?
No, the pilot boat is not on station. The pilot boat will be on station at 1200 hrs UTC.

5. ..... ?
You can take the pilot in your present position.

6. ..... ?
The pilot will embark at 1200 hrs local time.

5. Future events

I. What is going to happen?

– Use the appropriate verb and make a sentence with "be going to" for each picture.

launch	deliver	approach	repair	go down	enter
apply	disconnect	tow	land	sail	discharge

1. I ..... the ladder to the pump room.

2. The tug boat ..... the loading terminal area.

3. The engineers ..... the cylinder liner.

4. They ..... the final coating to the vessel in the dry dock.

5. The tanker ..... under the bridge.

6. The crew members ..... the cargo hoses.

7. The vessels ..... each other for an STS operation.

8. The helicopter ..... on the vessel.

9. They ..... the lifeboat.

10. The tugs ..... the vessel.

11. They ..... the containers.

12. They ..... the fenders.

II. Future plans

a) Listen to a Professor of City University, London, presenting their MSc on Maritime Operations and Management course.

i. Listen and answer the following questions:

- What type of job does this degree prepare you for?
- Can you enter the course if you are a serving seafarer?
- How many terms are there in the full-time course?

ii. Here is an outline of the presentation. Listen again and fill in the missing words.

- Full-time course – duration: 1 year
- Part-time course – duration: up to ..... years

You can come with an undergraduate degree in subjects like:
Law, Science, Engineering, Accountancy, Management

If you come from the sea, you need a ..... Certificate with some years of experience as Master or ..... .

1st term	*2nd term*	*Final term*
(compulsory modules) Operations, ..., Law, Management, Accountancy and Finance *Note:* exams after Christmas	(optional modules) Off-shore Engineering, Environment, Marketing, ..., Risk Management, Ship	.... *Note:* viva

iii. Read a description of the course content and fill in the missing words.

offshore	technical	risk	advantage	operations

This course makes use of prestigious visiting speakers and takes (1) ..... of the importance of London as an international maritime hub. Students will gain an understanding of maritime (2) ....., management, marine law, accountancy and technology and the related business environment in the maritime industry. The course will also provide (3) ..... knowledge of selected aspects of ship design and operation and related maritime land-based or (4) ..... structures, sub-sea engineering / mining, environment, marketing, security, (5) ..... management and port operations.

iv. Imagine your at talking to a friend. You will take this course. Start with *"I will study..."*.

b) Share your future career plans with your study partner. Look at what other students have said.

I am going to try to take on a job with the Hellenic Coastguard.

After finishing the course in the Academy I am planning to travel for a few years until I get my Certificate of Competency as Chief Officer. Then, I will look for a job in the port, perhaps working in a pilot boat or a tug boat.

After I get my Captain Class A' Certificate, in my early thirties, I am planning to apply for a postgraduate degree. I hear that the shipping company sometimes funds such courses. I am going to perfect my English and make sure I meet all the necessary entry requirements. With a postgraduate degree I will be ready to find a good shore-based job, perhaps as marine superintendent.

Note: *For information on using "will" and "be going to", go to page 530.*

Round-up

A. Vocabulary Consolidation Self-Assessment.

Tick ☑ what you can do. Cross ☒ what you still find hard to do in English.

- ☐ ☐ Understand and use telex abbreviations
- ☐ ☐ Ask for and offer advice, in writing and in speech
- ☐ ☐ Turn abbreviated telex messages to full messages
- ☐ ☐ Turn full messages to telex form
- ☐ ☐ Talk about future events/plans

B. Class Project.

- Find out more about the history of ***telex*** (how it started, what purposes it served, etc.) and present to class.
- Find out more about the type of ***marine surveyors*** that exist, their tasks, their status, etc. and present to class.
- Find out more about ***Inmarsat*** and any new or possible future developments in the field of satellite communication for merchant vessels and present to class.

C. Look at the following three pictures. What is going to happen?

(a)  (b)  (c) 

D. Write a request to the ship's agents in a telex: you need consumables for the photocopier machine (paper, toner, ink cartridges).

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E. In pairs, tell your problem and offer some good advice. What is the best advice for each problem?

Student A:	*Student B:*
I have (a)…	You should…
headache	take some medicine
stomachache	take some rest
backache	call the doctor
temperature	wash and put on a band-aid
runny nose	take some aspirin
cut	have some tea with honey and raki

F. Match the verbs to the nouns. Draw arrows.

to pay	a request
to fund	your dues
to make	an incoming call
to have	a postgraduate course
to receive	the chance
to install	a communication system

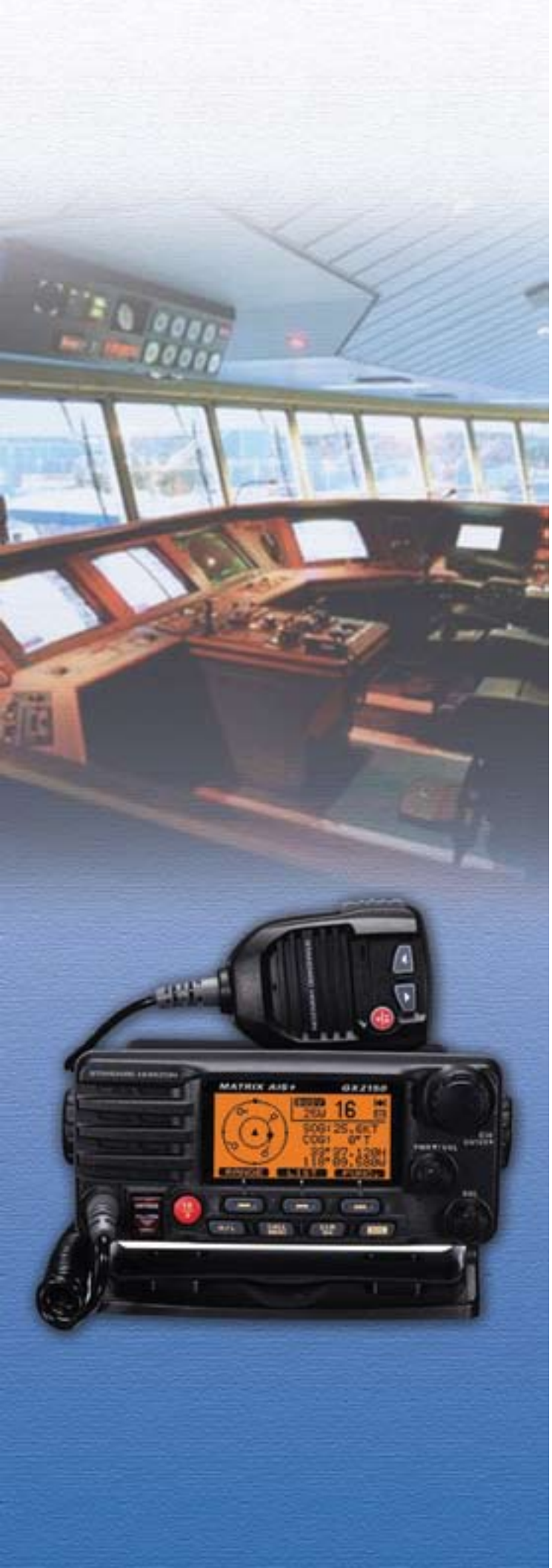
G. Fill in the gaps with the following words.

mandatory	fulfil	unrestricted	worldwide
area	suspended	revert	consideration

1. I will _____ with the information you requested soon.
2. Our courier company offers _____ coverage.
3. After careful _____, I would advise you to make an insurance claim.
4. The route to the island is _____ until further notice.
5. A GMDSS installation is _____on board.
6. All ships which make long voyages are ships in "_____ service" and must _____ A3 operation _____ requirements.

H. Match each sentence with the appropriate advice.

1. I feel overworked. ☐ You shouldn't sleep so late.
2. I feel so sleepy in the morning, I find it hard to wake up. ☐ I think she should sign off now.
3. She's been on board for 7 months. She's completed her service. ☐ You should take some time off.
4. There are too many homeless people in the streets. ☐ I think the government should do more to help homeless people.
5. My salary is very low. ☐ I think you should look for another job.
6. I hate smoking, especially in restaurants. ☐ I think they should resign.
7. The government has made too many mistakes. ☐ I think they should ban smoking in restaurants.



UNIT 15

I Read You Good

1. *Accidents and radiotelephone communication at sea*
2. *IMO guidelines on the use of VHF at sea*
3. *VHF communication procedures: format and protocols*
4. *GMDSS and DSC*
5. *Routine traffic*
6. *What were you doing at the time of the accident?*

Round-up

1. Accidents and radiotelephone communication at sea

A. ***Read the two extracts below. What is the point they both demonstrate? Choose one of the following.***

a) The importance of adequate VHF communication between Pilot on board and VTS for avoiding collision accidents.
b) The importance of proper knowledge and use of the VHF communications procedure in an emergency.
c) The importance of using radiocommunications effectively for alerting SAR authorities and ships in the vicinity to a distress incident with the minimum of delay.

Faulty communications lead to disaster on the Mississippi.

In conditions of thick fog, a supply vessel tried to make contact with a container vessel on channel 67* to avoid collision, but the pilot on board the container vessel (who was using only his handheld radio to monitor all relevant transmissions) missed the calls. The supply vessel failed to switch to channel 16.

The small vessel could not make contact with the pilot on board the larger vessel until it was too late. Its crew of five was lost as a result of the collision. The supply vessel was sold for scrap. The accident halted traffic for five days, five cruise ships were trapped, causing the most serious disruption to shipping on the Mississippi.

Had the supply vessel's operator switched to channel 16 – the one used for emergency distress calls – when in such a close-quarters situation, someone else aboard the larger vessel would likely have heard his transmissions and taken action to avert the collision.

Pertinent Rule: The Master or person in charge to pilot the vessel must maintain a listening watch on the designated frequencies.

(from USCG Lessons Learned from Casualty Investigations, Spring 2011)

Note: In US waters, channel 67 is used for monitoring river traffic, channel 16 is for emergency distress calls and channel 9 is for pilot communications.

Crewmember lost in man overboard situation.

Poor use of emergency communications delayed the provision of assistance from the Coastguard. The Master did not transmit a "Mayday" call activating the DSC distress function, or using Channel 16 to discuss the man overboard situation, and so significantly reduced the possibility of early assistance from the coastguard and other shipping in the area.

(*from MAIB Accident Report, September 2011*)

B. ***The following useful phrases come from the texts above. Match the words below to recreate them, then underline the phrases in the text to see if you are right.***

1. make contact	radio
2. handheld	with… (vessel) on… (channel)
3. miss	distress function
4. switch to	a call
5. designated	another channel
6. keep / maintain	radio traffic / transmissions
7. monitor	VHF frequency
8. activate the DSC	a listening watch

Glossary

close quarters	very near, a situation of being very close to something / someone
avert	prevent something bad or dangerous from happening
pertinent	relevant or appropriate to a particular situation
provision	the act of supplying somebody with something that they need or want

C. ***Fill in the gaps with the words in the glossary above.***

1. Talks are taking place in an attempt to _____ a strike.
2. Please keep your comments _____ to the topic under discussion.
3. The government is responsible for the _____ of health care.
4. A _____ situation occurred early this morning in the south-west bound lane of the Dover Strait traffic separation scheme.

D. ***The "Estonia" disaster (1994) demonstrates how communication problems (both on-board and external communication problems) can make an emergency situation become critical. Read about the case in the following text and answer the questions orally.***

1. How many nationalities were there on board?
2. What language was used to inform the passengers of the situation?
3. What was the problem with the VHF distress call? Why wasn't it effective?
4. Did the officer on the Estonia give the vessel's exact position?
5. How long did it take before salvage assistance arrived at the scene?

"Estonia, are you… calling MAYDAY?"

The sinking of the cruise ferry MS Estonia in the Baltic Sea in 1994 claimed 852 lives and was one of the deadliest maritime disasters in the late 20th century.

The Estonia disaster occurred on September 28 ,1994, between about 00:55 to 01:50 (UTC+2) as the ship was crossing the Baltic Sea, en route from Tallinn, Estonia, to Stockholm, Sweden. She was carrying 989 passengers and crew.

According to the final disaster report the weather was rough, with a wind of force 7–8 on the Beaufort scale and a significant wave height of 3 to 4 meters. The captain of MS Silja Europa who was appointed on scene commander for the subsequent rescue effort, described the weather as «normally bad», or like a typical autumn storm in the Baltic Sea. All scheduled passenger ferries were at sea.

The official report says that while the exact speed at the time of the accident is not known, Estonia had very regular voyage times, averaging 16–17 knots, perhaps implying she did not slow down for adverse conditions. The chief mate of the Viking Line cruise ferry MS Mariella tracked Estonia's speed by radar at approximately 14.2 knots before the first signs of distress, while the Silja Europa's officers estimated her speed at 14–15 knots at midnight.

The first sign of trouble onboard the Estonia was a strange sound of metal against metal heard around 01:00, when the ship was on the outskirts of the Turku archipelago; but an investigation of the bow visor showed no obvious damage. At about 01:15, the visor separated and the ship took on a heavy starboard list.

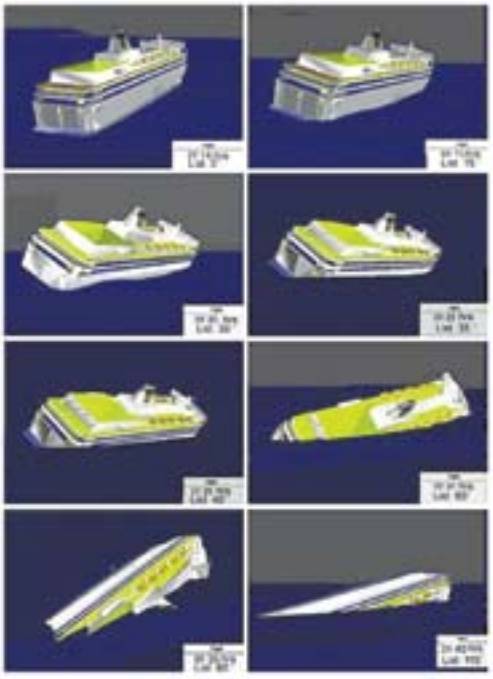
At about 01:20 a weak female voice called «*Häire, häire, laeval on häire»,* the Estonian words for "Alarm, alarm, there is alarm on the ship", over the public address system. Just a moment later an internal alarm for the crew was transmitted over the public address system. Soon after this the general lifeboat alarm was given. Soon the vessel lurched some 30 to 40 degrees to starboard, making it practically impossible to move about safely inside the ship. Doors and hallways became deadly pits.

Those who were going to survi ve were already on deck by then. A Mayday was communicated by the ship's crew at 01:22, but did not follow international formats. Due to loss of power, the vessel could not give her position, which delayed rescue operations somewhat. The ship disappeared from the radar screens of other ships at around 01:50. Mariella arrived at the scene of the accident at 02:12; the first rescue helicopter arrived at 03:05. The vessel capsized and the wreck is now 22 nm from Uto island, Finland, at about 80 meters of water.

Out of a total of 989 passengers and crew on board, 137 were saved. The accident claimed 852 lives (501 Swedes, 280 Estonians, 23 Latvians, 10 Finns and 19 people of other nationalities), by drowning and hypothermia, (the water temperature was 10–11° C). 92 bodies were recovered.

After the Estonia disaster in 1994, the IMO codified English as the official language of seafarers in 1995 and adopted the Standard Marine Communication Phrases (SMCP) as a standardized code in 2001. The GMDSS was made a requirement in 1999, featuring DSC.

Bow visor of a ferry



Listing and capsizing of the Estonia

E. ***Match the words below to make collocations found in the text. Draw arrows.***

adverse	report
loss	(weather/sea) conditions
official	claimed many lives
appoint	of power
the disaster	an on-scene commander

F. ***Match the synonyms of the following words found in the text.***

1. hallway	☐ to some degree
2. pit	☐ the outer parts
3. somewhat	☐ corridor
4. outskirts	☐ make a sudden, unsteady movement forward or sideways, sway
5. lurch	☐ large deep hole

G. ***Listen to the actual Mayday call sent from Estonia. In what ways does it fail to follow international formats? Listen carefully and circle YES or NO for the following statements.***

YES	NO	The Mayday call is addressed to a particular ship only (Silja Europa).
YES	NO	The officer addresses and identifies several times to make contact.
YES	NO	The Mayday call contains the ship's call sign.
YES	NO	The Mayday call contains the ship's position.
YES	NO	The Mayday call contains the nature of distress.
YES	NO	The Mayday call contains the assistance required.
YES	NO	The officer cannot make the communication in English and reverts to another language.

H. ***(i) Why is it important to follow international conventions in sending VHF messages, especially distress messages? (ii) Have you used the equipment shown in the following two pictures? Where can you find it on board?***

VHF set and DSC on top

Handheld / portable marine VHF radio

2. IMO guidelines on the use of VHF at sea

Lead-in: VHF marine messages.

a) QUIZ: Check what you know. Choose the correct alternative of the options in italics.

1. To *address / identify* means to call the other ship's name.
2. You want to ask how well the other party is receiving you, what do you say?
   a. "How do you read me?"
   b. "How do you hear me?"
3. If you hear the following message: "I read you poor, with signal strength two", this means that the receiving station can hear your message:
   a. Well (it's a good signal).
   b. Not very well (it's a weak signal).
4. You hear the following message: "Advise you change to VHF channel 16." What does it mean?
   a. The other vessel is standing by on VHF channel 16.
   b. The other vessel recommends changing to VHF channel 16.
5. You hear the following message: "Say again"; this means:
   a. They will repeat their message.
   b. Your own message is not properly heard. They want you to repeat it.
6. When you think your message is very important and you need to make sure it is heard properly, you say: *"Repeat / Go again"* and you say your message again.
7. You made a mistake in your message, what can you say to correct it?
   a. Wrong. Right:…
   b. Mistake. Correction:…
8. My transmission has ended and I expect a response from you (turn-giving signal):
   OVER / STANDING BY
9. The following word is spoken three times at the beginning of a safety call:
   SECURITE / SAFETY

b) Check what you know. True or False?

1. …… A distress alert is sent by DSC and a distress call is made by radiotelephony (voice) starting with a distress signal MAYDAY.
2. …… The priority of messages is in the following order: *1. Urgency, 2. Distress, 3. Safety*
3. …… *"Stand by on VHF channel 12"* means I am asking you to remain on VHF channel 12 and wait for my reply.
4. …… DSC is transmitted and received on Channel 16.
5. …… You hear *"Message not understood"*. This means your message is not received properly.
6. …… *"This is …"* is used to identify a station, it means "I am calling from…"
7. …… I am terminating my transmission, the conversation is ended and no response is expected – *OUT*
8. …… Advise the calling station to proceed with the message – *GO AHEAD*

IMO GUIDELINES ON THE USE OF VHF AT SEA: Do the exercises below to have the completed guidelines that must be followed.

A. *KEYWORDS: Pick at least one and try to explain it to class.*

acknowledge receipt	working channel	distress call/message
continuous watch	digital selective calling	

B. *What channel is used in each of the following cases? Match.*

Channel 16	A channel indicated by the coast station	Channel 13

1. ..... is used for bridge-to-bridge communications.
2. ..... is used for distress, urgency and brief safety communications.
3. ..... is used for communication with a coast station.

C. *Match the two halves to form correct guidelines.*

1. Do not transmit…	☐ and pass it on to the Master.
2. Stop all other transmissions and keep a listening watch…	☐ and also on VHF channel 16; it is required under SOLAS 1974, as amended (Chapter IV, Radiocommunications).
3. Record any distress call/message in the ship's log…	☐ without correct identification (always identify your vessel, using "THIS IS").
4. Use the SMCP…	☐ of a distress message if you are in the vicinity.
5. Keep a continuous listening watch on VHF DSC channel 70…	☐ if you receive distress calls/messages; they have absolute priority over all other communications.
6. Immediately acknowledge receipt…	☐ whenever possible to resolve any language problems.

D. *Fill in the words or phrases in the following instructions / guidelines.*

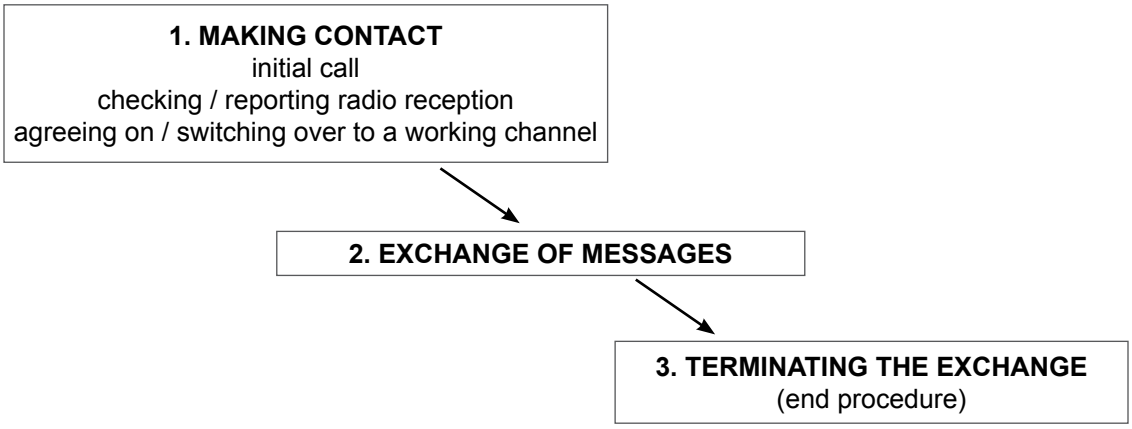
"all ships"	"I will use the IMO SMCP"	"received, understood"	"out"	"this is"
"received"	"change to channel …"	"message not understood"	"over"	"say again"

1. The word ..... indicates the end of a communication.
2. The word ..... invites a reply during the exchange of messages.
3. Say ..... if it is necessary to change to a different channel. Wait for acknowledgement before carrying out the change.
4. Say ..... if a message is received but not understood.
5. Say ..... to ask for a message to be repeated; the message is not properly received and you want it to be repeated.

6. Say ……. when there are language difficulties and try to resolve them by use of the standard phrases.
7. Say ……. where a message is received and acknowledgement of the correct message is required.
8. Say ……. where a message is received and only acknowledgement of receipt is needed.
9. Address your call to …… when you are communicating with a ship whose name is unknown but its position is known.
10. You are calling a coast radio station or another ship; say the name of the other station once (twice in heavy radio traffic conditions), then the phrase …….. and your ship's name twice, indicating the channel in use.

3. VHF communication procedures: format and protocols

Structure: Stages of a VHF exchange procedure



A. ***Which stage does each of the following phrases belong to? Write 1, 2 or 3 next to each phrase.***

- This is…
- Out
- (Advise you) switch to VHF channel…
- Switching to VHF channel…
- Thank you for your cooperation. Have a good watch.
- Intention: I will proceed.
- How do you read me?
- I read you bad.

In Routine Messages...
i. you address the responding station or ship,
ii. you identify yourself (the station you are calling from) by giving name and call sign,
iii. the responding station acknowledges the reception using the same method.

If conditions for establishing contact are unknown or expected to be bad, the addressing and

identifying must be done three times; when conditions are good you can address / identify once or twice. Look at an example of an initial call and the information it contains:

	Calling station
SANTIAGO PORT CONTROL, SANTIAGO PORT CONTROL	← **Address** the station you are calling (2/3 times)
THIS IS DORIS LIMA ALFA GOLF PAPA FIVE, DORIS LAGP5	← **Identify** your own station
(CALLING) ON CHANNEL 16.	← State the **VHF channel** on which you are calling
OVER	← **Over** (turn-giving signal)

	Responding station
DORIS LAGP5 DORIS LAGP5	← **address**
THIS IS SANTIAGO PORT CONTROL, SANTIAGO	← **identify**
PORT CONTROL (ON VHF CHANNEL ONE-SIX)	← (channel)
GO AHEAD	← advise them to proceed
OVER	← **Over**

B. *Student A is in the Calling Station and Student B is in the Responding Station. Make the initial call in order to make contact.*

Calling Station	*Responding Station*
SEALINK RGB6	ROTTERDAM VTS
GALINA ARX3	MALAGA PILOT STATION
PRIDE NSCK	SAN FRANCISCO COASTGUARD
JOY CHR9	SOLENT RADIO

C. *Listen to the VHF communication. What is its topic? Who are the two parties?*

Readability: This is what you say if the reception is good / bad:
How do you read me? I read you …. ***bad / one*** (with signal strength one, i.e. barely perceptible)
poor / two (with signal strength two, i.e. weak)
fair / three (with signal strength three, i.e. fairly good)
good / four (with signal strength four, i.e. good)
excellent / five (with signal strength five, i.e. very good)

Switching to a working channel: *Switch to (VHF channel) … / Change to … / Go to …*

Calling Station

PRIME, HR543
THIS IS TRIESTE RADIO.
SWITCH TO VHF CHANNEL 25.
OVER

Responding Station

TRIESTE RADIO
THIS IS PRIME, HR543.
AGREE: SWITCHING TO VHF CHANNEL 2-5.
OVER

D. ***Use the readability code and follow the instructions below to make an exchange.***

Student A:	*Student B:*
Ask about the reception. Suggest using another channel.	Say the reception is poor. Agree and confirm.

Exchange of Messages: In the message exchange procedure the SMCP message markers can be used to introduce the content and purpose of the message.

E. ***Look at the following examples and write the appropriate message marker in front of each message: [ADVICE / WARNING / REQUEST / QUESTION / ANSWER / INFORMATION / INTENTION / INSTRUCTION].***

	Do you have passengers on board?
	No, no passengers on board.
	Buoy number one-five unlit.
	Please supply bunkers. Quantity: three thousand metric tonnes.
	I will reduce speed, new speed: eight knots.
	Steer course two - two - three degrees true. Repeat, to comply with traffic separation scheme steer course two - two - three degrees true.
	Advise you anchor clear of fairway.
	The fairway entrance is: position: bearing 1-3-7 degrees true from North Point Lighthouse, distance: 2 decimal 3 miles.

Also, make sure you use the SMCP in VHF communication. Here are some examples:

	SMCP in VHF communication
1. Vessel is unmanoeuvrable.	***Warning: I am not under command.***
2. Vessel will continue its voyage.	***Intention: I will proceed.***
3. Water is not deep enough.	***Warning: depth of water not sufficient.***
4. Visibility is reduced by fog.	***Warning: visibility is restricted by fog.***
5. Buoy L2 is no longer in correct position.	***Warning: Buoy Lima – two is off station.***
6. No light on buoy H3 in position 44º 30' N, 042º 52' E.	***Warning: Buoy Hotel three in position 44º 30' N, 042º 52' E unlit.***
7. We have detected a shoal in position 69º 29' N, 042º 53' E that has not been charted yet.	***Warning: uncharted shoal reported in position 69º 29' N, 042º 53' E.***

8. Vessel needs pilot service.	***Request: I require pilot.***
9. MV Cullen is on its way from one berth to another.	***Information: MV Cullen is shifting berth.***
10. We are performing dangerous operation in position 69° 29' N, 042° 53' E. Traffic is requested to keep distance from us.	***Warning: Hazardous operation in position 69° 29' N, 042° 53' E. Wide berth requested.***

F. ***Write the appropriate SMCP for each of the following cases. Don't forget to introduce them with a message marker. For extra help (or to check your answers), choose from the list given on the next page.***

	SMCP in VHF communication
1. Salvage operation in progress in position 69° 29' N, 042° 53' E. Vessels are requested to keep distance.	
2. Route from roadstead to entrance temporarily not to be used.	
3. Inshore traffic lane permanently closed for navigation.	
4. VTS wishes to know if the vessel has any defects.	
5. The vessel states that their SB ballast pump is not working.	
6. VTS wishes to know where the vessel is going to.	
7. VTS wishes to know what port the vessel is coming from.	
8. Vessel is advised to change course to port side.	
9. Vessel is allowed to enter traffic lane at 1200 hours UTC and proceed to berth no. 7B.	
10. Vessel's berth is not ready yet.	
11. She is instructed to set course to waiting area.	
12. Waiting time is 4 hours.	
13. Vessel's intention is to increase speed to 12 knots.	
14. Vessel's intention is to maintain course and speed.	
15. Danger, there is an underwater wreck ahead of unknown vessel's position.	

• Information: route from roadstead to entrance suspended.	• Information: navigation closed in inshore traffic lane.	• Advice: Advise you alter course to port.
• Question: Do you have any deficiencies?	• Answer: Starboard ballast pump inoperative.	• Information: salvage operations in position 69° 29' N, 042° 53' E. Wide berth requested.
• Question: What is your last port of call?	• Instruction: You must proceed to waiting area.	• Information: You have permission to enter traffic lane at 1200 hours UTC – traffic clearance granted; proceed to berth number seven – bravo.
• Question: What is your destination?	• Intention: I will increase my speed to one-two knots.	• Warning! You are running into danger! Submerged wreck ahead of you.
• Information: Berthing delayed for 4 hours.	• Intention: I will stand on.	• Information: Your berth is not clear.

G. *Imagine you are transmitting the following message on the VHF. What do you say?*

VTS-station to all vessels

VTS-station Palermo Radio to all vessels in vicinity of Capo Callo: Traffic movement information at 1325 hrs UTC; salvage operation is in progress in the NE traffic lane. Salvage vessel "Bravissimo" is hampered. Vessels are requested to keep distance.

End Procedure: The conversation can be terminated by saying "Nothing more" and by adding a polite greeting. Finally the closing phrase "Out" or "Over and out" is used. For example:

Calling station

Perth VTS. This is Aries. Message understood. Nothing more. Thank you. **Over.**

Responding station

Aries. This is Perth VTS.
Have a good watch. **Over and out**.

H. *Put the following messages in order. Write the correct number (1-6) in the boxes provided and then work in pairs to act out the communication.*

☐ Delica, Southampton VTS. Advise you change to VHF channel 22. Over.

☐ Station calling on channel 16, this is Southampton VTS. Advise you try VHF channel 22. Repeat – change to VHF channel 22. Over.

☐ Southampton VTS, Delica. Changing to VHF channel 22. I am ready to receive your message. Over.

- ☐ Southampton VTS, this is Delica, Lima Oscar Tango Two on channel 16. Say again. Over.
- ☐ Southampton VTS, Delica. Message understood, instruction received: I will steer course two-two-three degrees true to comply with traffic separation scheme. Over and out.
- ☐ Delica, Southampton VTS. Alter course – repeat – alter course. You are not complying with traffic separation scheme. Instruction: Steer course two-two-three degrees. Over.

I. *Choose from the following procedure words / phrases and fill in the exchanges below.*

Over	Say again.	Mistake … correction.
Go ahead with your message.	Message understood.	Repeat
Nothing more.	That is correct.	Must
Stand by on VHF channel…	Will	

1. Primavera, Papa Kilo November Sierra. This is Dover Coastguard, Dover Coastguard. Instruction: You …….. reduce speed to eight knots. ……..: You must reduce speed to eight knots. …… .	
	Dover Coastguard; This is Primavera, Papa Kilo November Sierra. …….. . I …… reduce speed to eight knots. ……..... . Out.
2. Helsinki Radio, Helsinki Radio; This is Garland, Garland – Golf Foxtrot Charlie Charlie Two. My draft aft is six decimal five metres. …….: My draft is seven decimal five metres. Over.	

J. *What is the appropriate response to each message? Write up the replies.*

1. Question. What is your present speed?	Answer. ……
2. Alter course – repeat – alter course to SE.	Message …… . I …… ……
3. Advise you pass astern of me.	I ……

4. Your berth will be clear at 08.30 hours.	Received, understood. ……
5. Port Traffic, this is Sea Star, Sea Star, on channel 14.	Sea Star, ……..... . Advise you …….....… channel 12.
6. How do you read me?	I ……
7. Stand by on VHF channel 16.	Standing ……

K. ***To practise the correct structure and the use of procedure words in VHF marine communications, the following section provides role-play exercises to be simulated in class. In pairs, choose which role each student will act out; make sure you use SMCP as much as possible, like the phrases given in exercises E & F (p. 342-343).***

M/V Nord Power, call sign 9V810, IMO number: 9271626. Loaded 92.960 tons of iron ore at Port Hedland, Australia. The vessel is stopping at Shanghai for bunkering while heading for Kanmon Port, Japan.

i. Put the phrases in the correct place to recreate the following VHF communication at Shanghai. Then, in pairs, act it out. (some headings are given in the margins for help).

I read you signal strength four.	Wusong VTS – Wusong VTS – Wusong VTS	QUESTION: Must I take pilot?
On VHF-channel 13	Go ahead. OVER	How do you read me? OVER
~~Wusong VTS, this is Nord Power.~~	Nord Power, Nord Power	Nord Power, Wusong VTS
Call Pilot Station on channel 12 to arrange for pilot embarkation time.	Message understood. I will call Pilot Station on channel 12, and then call you back.	This is MV NORD POWER, 9V810 - MV NORD POWER - MV NORD POWER
Wusong VTS, this is Nord Power.	Then call us back to arrange for pilot embarkation point. OVER	OUT
This is Wusong VTS, Wusong VTS,	ANSWER: Yes, pilotage is compulsory.	

	M/V Nord Power	***Wusong VTS (Shanghai Port)***
Address	**1.**	
Identify	**2.**	
	3.	
	4.	

		5.	*Address*
		6.	*Identify*
		7.	
		8.	
Message	**9.** Wusong VTS this is Nord Power		
	10.		
		11.	*A & I*
		12.	
		13.	
		14.	
A & I	**15.**		
	16.		
Ending of message	**17**		

ii. Simulate the following VHF communication in Shanghai. Write the vessel's part of the communication below and then, in pairs, act out the exchange.

M/V NORD POWER	WUSONG VTS (SHANGHAI PORT)
WUSONG VTS, this is NORD POWER.	
	NORD POWER, WUSONG VTS. Question. What is you cargo? Over.
	NORD POWER, WUSONG VTS. Question. What is amount of cargo in metric tons? Over.
	NORD POWER, WUSONG VTS. Question. What is your last port of call and your next port of call? Over.
	NORD POWER, WUSONG VTS. Say again your next port of call. Over.
	NORD POWER, WUSONG VTS. Message understood. Nothing more. Over and out.

iii. In Kanmon Port, Japan, the vessel had a collision accident. Follow the instructions given for each exchange and simulate the VHF communication between Kanmon MARTIS (Kanmon Port VTS, Japan) and M/V NORD POWER.

M/V Nord Power	***The VTS operator for Kanmon MARTIS***
Address Kanmon MARTIS, identify yourself. Report vessel begins to leave the berth No4 via Tobata Passage. Report your vessel has collided near Lighted Buoy No.11. Give your position; 33°57′N, 130°52.33′E.	Acknowledge the call. Inform that there are many vessels navigating westward near lighted Buoys No.11-19. Ask for vessel's position. Confirm the position of vessel. Ask vessel to stand by on channel 16. Call for the attention of all vessels in Kanmon Passage and broadcast the accident.

iv. Act out and record the communication (on your mobile); play it back to check how you sound.

VTS-station calling Vessel.

Role A: VTS-station Palermo Radio	Role B: M/V PORTAL (Call sign: WQYA8)

VTS station wishes to know vessel's course and speed (085 degr. True / 12kn.), where the vessel is going to (Rotterdam), what port the vessel is coming from (Singapore), what is the next port that the vessel will go to (Marseille) and if the vessel has any defects (radar not functioning).
Palermo Radio informs that PORTAL's berth is not ready yet. PORTAL is forbidden to anchor in present position. The vessel must set course to waiting area. Waiting time is 6 hrs.

or

Calling unknown vessel on ch. 16 – message on channel 13.

Role A: M/V CHASER – DEKL2	Role B: Unknown ship [Argos O7PRT, in posn. 085 degr from Rialto Lighthouse, dis. 7.5 miles]

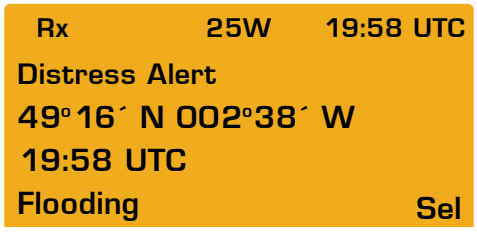
M/V CHASER calls unknown ship to indicate that it is approaching shoals that are not mentioned on the chart, and advises the vessel to change course to port. The "unknown ship" receives the message and will follow the advice.

v. In pairs follow the instructions and simulate the VHF communication using the SMCP.

Livorno VTS	*M/V MARCO (Call sign: WEU7E)*
	Inform the VTS that you are travelling in the south easterly direction of the TSS.
Warn the vessel is leaving the TSS and running into danger. Instruct the vessel to follow a Northern direction immediately.	
	You have received the message and will follow the instructions.
Ask about present speed.	
	Say present speed is 13 knots. You made a mistake. Your present speed is 15 knots. Make the correction.
Tell the vessel to stand on. Tell the vessel to stand on again, it is an important instruction that needs to be repeated.	
	You haven't received the message correctly. Ask for it to be repeated.
Tell the vessel to stand on.	
	You have received the message and will follow the instruction.

4. GMDSS and DSC

A. ***What is the nature of distress in the following DSC distress alert? What other information is displayed?***

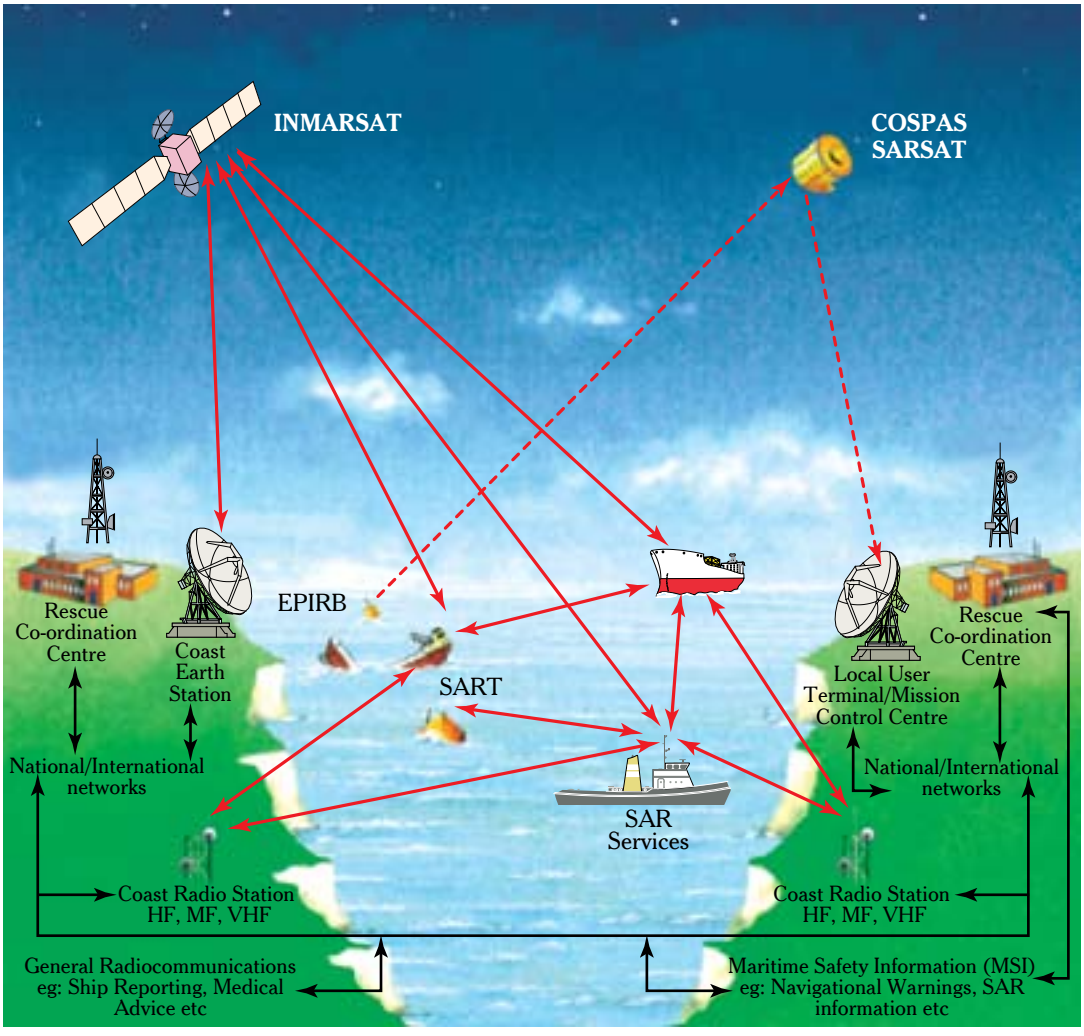


B. ***Read about GMDSS and DSC and fill in the missing phrases. Choose from the words in the box that follows.***

Ship radiocommunications entered a new era on 1 February 1999 with the (1)……..... of the Global Maritime Distress and Safety System (GMDSS); an integrated communications system using satellite and terrestrial radiocommunication systems. (2)…….. , all passenger ships and all cargo ships over 300 gross tonnage on international voyages have to carry (3)…… terrestrial and satellite radiocommunications equipment for sending and receiving distress alerts and maritime safety information, as well as for general communications.

DSC provides a simple and reliable means (4)…….. contact *prior to* starting voice communication. The DSC controller sends a digital signal that will ring other DSC radios by triggering an alarm and displaying details about the caller and the nature of the call. The digitally transmitted information (e.g. MMSI number, distress position) is displayed in writing. When a DSC call is received by another station, its VHF radio (5)…… and details of the call are displayed. Once a DSC call has been transmitted to a particular station or to all stations in the area, a voice message should be sent in the normal way.	*A Received DSC message contains the following:* ***From:*** MMSI number ***Nature of distress:*** explosion / fire, flooding, collision, grounding, listing, sinking, (6)…… , piracy, undesignated distress. UTC Lat, Long, bearing or range

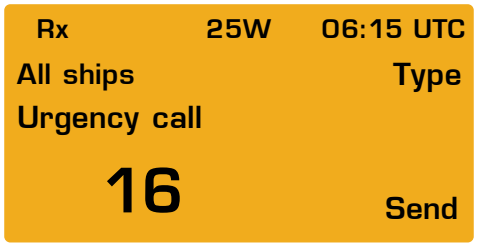
disabled & adrift	under GMDSS	full implementation
starts ringing an alarm	specified	of establishing



VHF Marine Transceiver with DSC

URGENCY MESSAGE (GMDSS vessels)

i. Urgency announcement sent by DSC:



ii. The following calling sequence is transmitted by DSC:

Format specifier	Category	Self identifier	Frequency or channel	Subsequent communications
All ships	**URGENCY**	**259896000**	**Channel 16**	**radiotelephony**

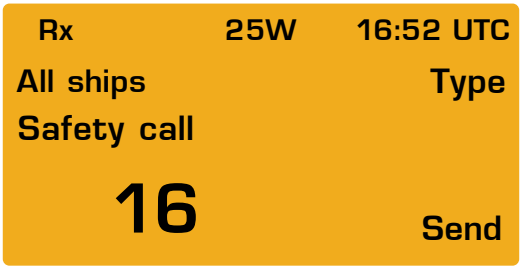
All ships urgency announcement by Doris (259896000).

iii. Urgency call and message by voice:

PAN PAN PAN PAN PAN PAN
ALL STATIONS ALL STATIONS ALL STATIONS
THIS IS TWO FIVE NINE EIGHT NINE SIX ZERO ZERO ZERO MOTOR TANKER DORIS
CALL SIGN LIMA ALFA GOLF PAPA FIVE
POSITION FOUR FIVE DEGREES FOUR SIX MINUTES NORTH ZERO ZERO ONE DEGREES THREE ZERO MINUTES WEST
I HAVE PROBLEMS WITH ENGINES, HEAVY FISHING NET HAS FOULED MY PROPELLER, I AM DRIFTING TOWARDS MILE ROCK DUE TO A CURRENT OF THREE DECIMAL FIVE KNOTS
OUT

SAFETY CALL BY A SHIP STATION

i. Initial contact by DSC:



ii. Subsequent voice communication on channel 16:

SECURITE SECURITE SECURITE
ALL SHIPS ALL SHIPS ALL SHIPS IN AREA GALVESTON BAY
THIS IS TWO FIVE NINE EIGHT NINE SIX ZERO ZERO ZERO MOTOR TANKER DORIS
CALL SIGN LIMA ALFA GOLF PAPA FIVE
INFORMATION: DRIFTING LOGS IN POSITION THREE NAUTICAL MILES FROM GALVESTON BAY ESTUARY – DANGER TO NAVIGATION
OUT

C. ***Follow the international formats given in the examples above and make the following calls.***

Urgency

211 868 000 M/V "Christina – PKHA1" in posn. 56 degr. 29 min. N, 011 degr. 53 min. E, has transmitted a DSC urgency alert that has been acknowledged by RCC and now transmits an urgency message on VHF. The vessel has suffered damage below its waterline and requests tug assistance.

Safety

345 887 000 – Tanker "Vermont – YTBV", in posn. bearing 259 degr. from Guardian Angel Lighthouse, distance 2 miles, has transmitted a DSC safety alert that has been acknowledged by RCC and now transmits a safety message. The vessel has detected that buoy B2 in posn. 185 degr. from Guardian Angel Lighthouse, distance 3 miles, is unlit. Time: 0100 UTC (Sept. 14, 2012).

5. Routine traffic

Listen to the following routine VHF communications and do the exercises.
(All communications are by courtesy of Piraeus Traffic VTS.)

A. *"Pacific Spirit to Piraeus Traffic"*

i. Which of the following phrases can you hear in the communication? Listen and circle the phrases you can hear.

Over and Out	Standing by at 14 and 16
Do you read me?	TSS
Total amount of cargo	Northbound lane
Wait for pilot embarkation	Pilot Station

ii. What is the topic of the communication?

a) To arrange for pilot embarkation point.
b) To arrange exit from the fairway.
c) To arrange entry to the fairway.

iii. Accurately write down the details of the required action from the VHF communication. Imagine you are the deck officer on the Pacific Spirit. Keep notes as to the instructions given from Piraeus Traffic. Fill in the missing information:

- Call VTS at the ……. exit of the TSS.
- Call Pilot Station …….. nm distance from the yellow buoy.
- Call back VTS for further instructions.
- Wait for pilot embarkation …… nm dist. SW of yellow buoy.

B. *"Station calling Piraeus Traffic"*

i. Listen to a VHF communication between Piraeus Traffic and a yacht. What is the topic of the communication?

ii. Read the report of the communication. Choose the correct alternative of the underlined words.

The vessel (a yacht) reported to the VTS its intentions (they had left Zea Marina and were sailing for a shipyard / Crete). The VTS gave clearance to proceed, and advised them to pay attention to the South exit / main entrance of Piraeus. The yacht reported that they are standing by at the designated channels (13 and 14 / 12 and 14).

C. *"Message received by Piraeus Traffic". Listen to the VHF message. What is its topic? Why is the caller contacting Piraeus Traffic?*

a) To ask for permission to enter the fairway.
b) To ask for traffic information in the area.
c) To ask for permission to lower rescue boat for testing.

6. What were you doing at the time of the accident?

A. ***Look at the pictures and describe them. What were they doing?***

(a) 

.....
.....
.....

(b) 

The Second Officer was updating the logbook

(c) 

.....
.....
.....

(d) 

.....
.....
.....

(e) 

.....
.....
.....

B. ***At 12:12 on Wed 12/12/2012, M/V VENOM ran aground. What were these people doing when the ship grounded? Write the sentences using the Past Continuous.***

1. Bosun / sleep → The Bosun was sleeping.
2. A.B. / clean the deck → .....
3. Second Officer / update logbooks → .....
4. Deck cadet / do stencil painting → .....

5. Chief Engineer / order spare parts → .....
6. O.S. / chip off rust from the railings → .....

C. *Match the people to the appropriate activities (draw arrows) and then make full sentences using the Past Continuous.*

The deck officers	clean the cabins
The steward	weld pipes
The fitter	paint deck railings
The engineers	attend a new radar installation
The O.S.	overhaul the main engine

Note: *For information regarding the Past Continuous tense, go to page 532.*

D. *Match the words below to make correct phrases that describe routine tasks on board.*

1. drain	☐ the accommodation
2. lubricate	☐ a surface before painting
3. chart	☐ tanks
4. steer	☐ charts
5. correct	☐ the voyage
6. plan	☐ engine parts
7. lock	☐ the route
8. prime	☐ the vessel

Round-up

A. Vocabulary Consolidation Self-Assessment.

Tick ☑ what you can do. Cross ☒ what you still find hard to do in English.

- ☐ Understand the topic of a VHF communication
- ☐ Simulate VHF exchange procedures
- ☐ Report the message from a VHF communication
- ☐ Describe activities that "were happening" on board using the Past Continuous

B. Class Project.

- Find out more about IMO COMSAR: Radiocommunications and Search and Rescue, in www.imo.org, and present your findings to class.

C. Fill in the missing words.

stand by	close-quarters	claimed	activated	transmitted	on-scene	adverse

1. In a(n) ..... situation, vessels should follow the COLREGs as well as rely on VHF communications.

2. The Chief Mate …… the DSC and then made the emergency distress call.
3. How soon after the accident was a mayday call …… from the bridge?
4. The Titanic disaster …… many lives.
5. The rescue operation took place in …… weather conditions. A naval vessel in the vicinity was appointed …… co-ordinator.
6. When you want to ask the receiving station on the VHF to wait for further information you say …… .

D. What is the correct order of the stages of a VHF procedure. Put them in order. Then say a procedure phrase for each stage.

Switching over to a working channel / Checking radio reception / Making contact / Agreeing on a working channel / Exchanging messages / Terminating the exchange / Reporting radio reception

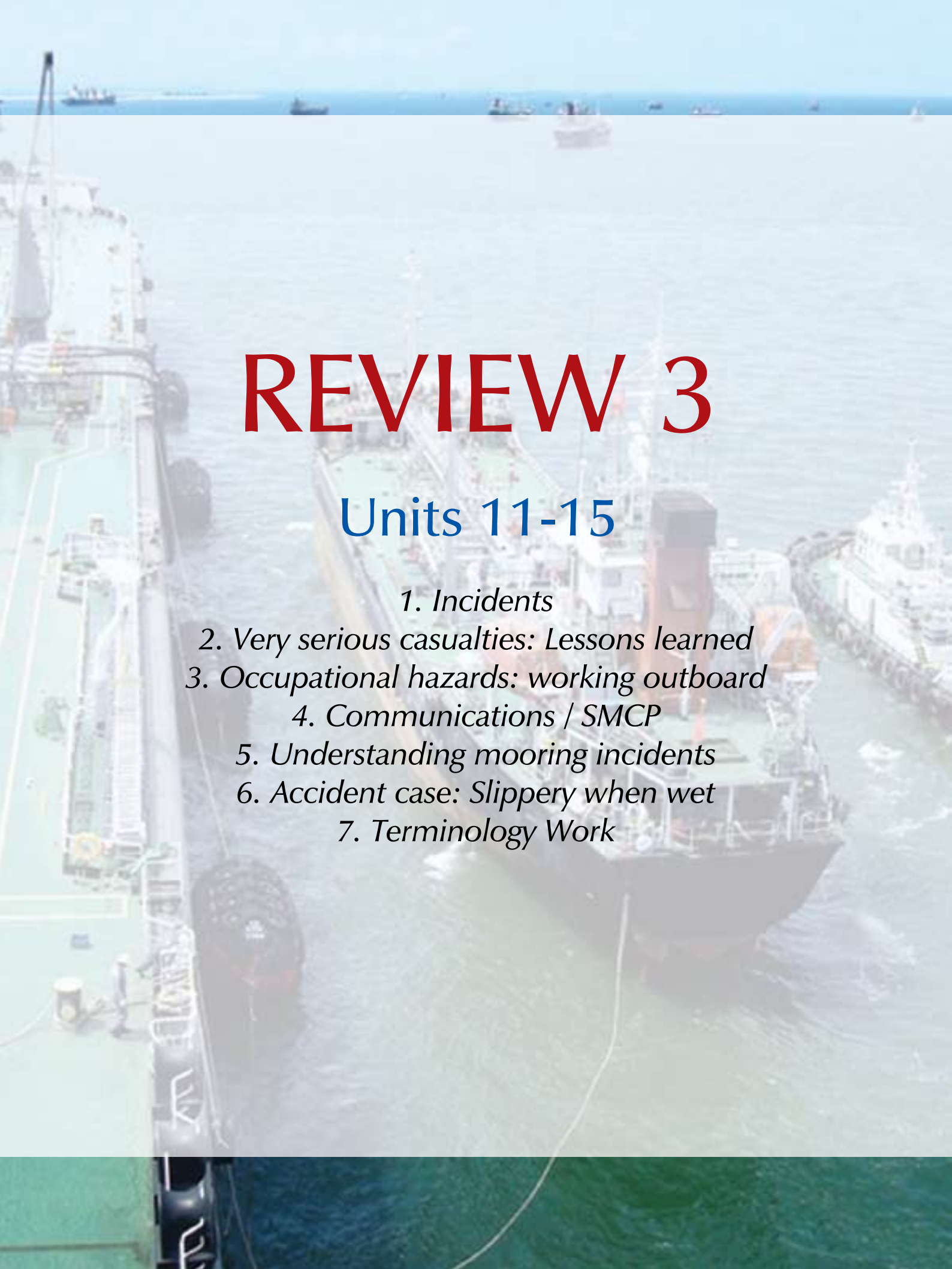
1.
2.
3.
4.
5.
6.
7.

E. A crewmember is talking to a friend about a minor accident. What happened? Listen and fill in the sentence below.

⇨ He …… up a ladder when he lost his footing and …… .

F. Complete the following sentences with the first verb in the past continuous (for actions in progress) and the second in the past simple (for single actions).

1. The cruise ship …….. (cross) the North Atlantic when the passenger …… (fall) overboard.
2. The vessel …… (leave) the port when the storm ……. (begin).
3. The ratings …….. (eat) lunch when the alarm ……. (sound).
4. The chief engineer …… (sleep) when the explosion …… (happen).
5. The pirates …… (shoot) with machine guns when the naval vessel …… (arrive) on the scene.



REVIEW 3

Units 11-15

1. Incidents
2. Very serious casualties: Lessons learned
3. Occupational hazards: working outboard
4. Communications / SMCP
5. Understanding mooring incidents
6. Accident case: Slippery when wet
7. Terminology Work

1. Incidents

Lead in: Look at the picture. What type of operation is in progress?

A. i. Listen to a news report about a maritime accident and fill in the information below.

TYPE OF INCIDENT:
SEA AREA WHERE INCIDENT HAPPENED:
TYPE OF VESSEL:
CASUALTIES:
LENGTH OF VESSEL:
NUMBER OF PERSONS ON BOARD (passengers and crew):
CAUSE OF INCIDENT:

ii. Listen again. Are the following statements true or false according to the news report?

True or False?

1. ……. There was a blackout.
2. ……. The evacuation was calm.
3. ……. Adequate information was given to the passengers.

B. Listen to another news report on the same maritime accident. Are the following statements true or false, according to the report? Write the correct information where necessary.

	True	*False*	*Correct info*
1. There was a helicopter rescue of a crew member.	☐	☐	……
2. The rescue took place 27 hours after the accident.	☐	☐	……
3. The crew member was the Chief Engineer, who was airlifted on a stretcher.	☐	☐	……
4. He has a broken arm.	☐	☐	……
5. There is fear of pollution as a result of the accident, but no leak has been identified yet.	☐	☐	……

2. Very serious casualties: Lessons learned

Divide in three groups. Each group chooses one of the cases below, fills in the table and presents their findings to class. Be ready to give clarifications if asked by the rest of the class. [Alternatively, you can choose one case and fill in the information individually, present it to class; the others can check the information you present if they have chosen the same case.]

Type of accident	
Casualties (fatality / injury)	
Type of vessel / cargo	
Duty performed (during time of accident)	
Cause of accident	
Special points (extra contributing factors, etc.)	
Main thing to learn (preventive measures, etc.)	

Enclosed space entry causing death and personal injury

What happened?

An ordinary seaman (O/S) and a deck cadet serving on board an about 36,000 gt Panamax bulk carrier lost their lives inside a cargo-hold while undertaking routine cargo temperature measurements at sea. A third crew member, the bosun, seeing the two crew members were in trouble, lost consciousness when attempting to assist them. Shortly afterwards the Chief Officer discovered the three crewmen in the cargo hold and raised the alarm. Members of a rescue party wearing SCBAs recovered the three seamen, but only the bosun survived. The event occurred on a bulk carrier carrying a cargo of coal which was known to be oxygen-depleting and prone to self-heating.

Why did it happen?

1. The cargo-hold was oxygen depleted. Carbon monoxide may also have been present in the air space above the cargo. According to readings taken on arrival in port the oxygen content in the hold was 14.1%. The reason why the first person entered the cargo hold is unknown but it may be that the thermometer to measure the cargo temperature was dropped or became snagged and the seaman went into the hold to retrieve it.
2. The three crew members who entered the space without SCBAs may have done so impulsively and possibly under the assumption that they could survive a brief presence in the cargo space.
3. The fact that the access hatch was open to enable the temperature readings to be taken must be considered a contributing factor.

What can we learn?

1. When dangerous cargoes are loaded that require specific knowledge for the crew, a safety meeting should be held prior to departure, at which all crew should be present, when appropriate advice and instructions should be given. Attendance of each crew member should be acknowledged in writing.

2. The dangers of entering enclosed spaces and the need for responding crewmembers to STOP, LOOK, LISTEN and EVALUATE the situation for existing dangerous conditions before taking emergency actions should be fully explained. Don't make a bad situation worse by becoming a casualty yourself!
3. When intending to carry oxygen-depleting or noxious gas-producing cargoes that require temperature monitoring, provision should be made in advance to enable this to be done without opening personnel access hatches. Measurement of carbon monoxide levels may provide a faster and safer indication of a cargo self-heating than temperature monitoring. Prior to carrying out operations involving dangerous cargoes, crews must be informed and understand the proper procedures and preventative measures to be taken.

Tanker explosion during tank cleaning

What happened?

While en route to load cargo, two crew members began cleaning the cargo holds of an oil tanker. The tanker had just discharged its cargo of unleaded gasoline. A loud whistling noise was heard immediately before the three instantaneous explosions and fire. The deck between the aft superstructure and the midship cargo maniflold was completely destroyed.
The crew member who was at the tanks being cleaned was killed. The other crew member at the midship cargo manifold was unharmed.

Why did it happen?

1. The explosion was the result of ignition of the accumulated gasoline vapours in the tanks.
2. While it is possible that the source of ignition may have been the result of a malfunction of a cargo pump causing an increase in temperature, it is more likely that it was the result of a build-up of electrostatic charges caused by the cargo pump or washing nozzle.

What can we learn?

Precautions should be taken to minimize or eliminate the generation of static electricity during cargo operations and tank washings. Further, cargo tank atmospheric testing should be carried out prior to performing tank cleaning operations and cargo tanks gas freed and monitored.

Fatality and injury to crew caused by hold cleaning rig

What happened?

The about 76,000 gt bulk carrier was at sea, the crew was cleaning cargo hold residues. The weather was good with light winds.

The crew was working with an unapproved, «home-made» lifting rig comprised of a portable boom with wooden blocks and nylon ropes to pick up cargo residues from the hold.

After several hours of work, the makeshift davit's boom failed due to over-heaving of the hoist rope by the winch and the boom struck two crew members who were attending to it on deck. Due to the tension of the hoist rope, the boom gave way at the welding seam and thus caused serious injuries to the attending crew.

First aid was administered on board. Medical help arrived on board by helicopter about 8 hours later. Fifteen hours after the accident, both the casualties were air-lifted by naval helicopter to a naval hospital.

One of the crew died en route to hospital. The second crew member was successfully treated.

Why did it happen?

1. The gear and rigging used for the purpose of lifting cargo from the cargo hold was fabricated on board and unapproved. This made the job conditions unsafe and prone to accident. In addition, the davit was corroded. The winch operator lost attention momentarily and did not notice the marking on the rope. He overheaved the rope using the winch, resulting in the davit boom breaking from the weld and thus causing the casualty.
2. There was also lack of attention on the part of the crew member giving signals by walkie-talkie to the winch operator, and the signal to stop heaving was not given in a timely manner. A qualified dedicated signal man was not assigned. There was lack of coordination on communication between the signalman at the lifting boom and the winch operator.

   There was poor situational awareness on the part of the crew who were making use of the unsafe lifting gear – not even knowing that they were working in unsafe conditions which could cause an accident. The risks involved in using the unapproved lifting gear were not identified or understood.
3. The lifting gear was not checked for any defects or damage prior to bringing them into use.

3. Occupational hazards: working outboard

A. Fill in the gaps with the words in the box.

illuminated	greases	slippery	rolling

The high percentage of occupational accidents onboard ship is not surprising, given the environment in which those who work aboard ship operate:

- a floating platform that is susceptible to pitching and …….……. movements;
- wet and …… deck surfaces;
- cavernous (and often poorly ……..) compartments and tank spaces;
- high masts, funnels and bulkheads;
- moving objects such as cranes, derricks, davits and hatch covers;
- and the presence of a variety of oils and ……..... .

B. Read about the maritime accident and fill in the information in the table below.

Fall from height
What happened? The seaman started work on a catwalk outside the port bridge wing. After a while he fell approximately 24 meters onto the wharf below. He died as a result of the injuries sustained from the fall. He was an experienced seaman who had been inducted in the ship's management system and had done this task many times.

Why did it happen?

The harness was not properly attached to the grab rail when the seaman probably lost his footing and fell. The contributing factors to the incident include an inadequate safety harness, the design of the catwalk, an inadequate workplace risk assessment and procedures.

Type of accident: .....
Casualties: .....
Cause of accident: .....
Scene of accident on board: .....

C. The following picture shows two ***methods of working outboard.*** *What is shown by each arrow? Write 1, 2, or 3 in the appropriate box.*

1. Plank where the crewmember is provided with a safety harness, a safety line and is also supposed to wear a life jacket.
2. A specially constructed cage hanging in the ship's crane, where the sailor inside is also provided with an independent safety line to the ship.
3. A watchman on board is overlooking both.

4. Communications / SMCP

External VHF communications between vessel and shore station

A. Read the following dialogues and...

i. supply the correct type of distress for each VHF communication.
ii. fill in the missing words.

(Try this exercise first without the help of the box with the missing words; if it is too hard for you, then use the box that follows)

1. _____
   - MV Patience position 20° 32' N 040° 15' W. I am …….. .
   - What part of your vessel is aground?
   - I cannot …… which part is aground. I will jettison cargo to refloat.
   - When do you …….. to refloat?
   - I expect to refloat when draught decreases.
2. _____
   - MV Endurance, position 15° 34' N 061° 20' W. I have collided with unknown vessel.
   - …… damage.
   - I have damage below waterline.
   - What …… of assistance is required?
   - I require tug assistance.
3. _____
   - I have problems with propeller.
   - What problems do you have?
   - I am manoeuvring with …….. .
   - Can you proceed …….. assistance?
   - I try to proceed without assistance.
4. _____
   - I am …….. crude oil in position 15° 35’ N 060° 20’ W
   - Is there danger of pollution?
   - Yes, danger of pollution.
   - Can you stop spillage?
   - No, I cannot stop spillage.
5. _____
   - I require medical assistance.
   - What kind of assistance is required?
   - I require radio medical ……..…….. and immediate hospital …… . I have two crewmembers seriously injured after fall.
   - Stand by on VHF channel 22. I will …….. for radio medical advice on VHF channel 22. I will send boat to transfer casualties. Boat ETA …….. one hour.

Types of distress: *technical failure / collision / grounding / requesting medical assistance / reporting oil spill*
Missing words: *within / establish / transfer / aground / expect / kind / without / difficulty / spilling / advice / arrange / report*

Onboard Communications

B. OCCUPATIONAL ACCIDENT: The Chief Engineer is talking with the bridge. Write the missing sentences.

- There is an accident in the engine room.
- …….. .
- The number of injured persons is two.
- Provide first aid. What happened?
- Explosion in auxiliary boiler.
- …… and report.
- The dangerous area is secured.
- …….. ?
- Radio medical assistance is required.

C. OIL SPILL: The Chief Officer is talking with the bridge. Fill in the missing verbs.

cleaned up	is spilling	pumping	report	remove

- Leak at manifold connection!
- Stop ……..! Is oil escaping into the sea?
- No, oil ……..……..……. on deck.
- How much is spilled?
- Spill about 2 tonnes.
- Has spillage stopped?
- Spillage stopped.
- Stand by oil clearance team and …….. .
- Oil clearance team standing by.
- Treat spill with absorbent materials. All crew assist to ……. the spill.
- Spill …… with absorbent materials.
- Spill waste contained in buckets.

D. BUNKERING COMMUNICATIONS: The following is an exchange between the vessel and the bunker barge. Put the words in italics in the correct order to make full sentences.

- Are you ready to bunker?
- Yes, I am ready to bunker.

  ……..……
  [have / all / I / safety / prepared / measures]
- Connect barge hoses.
- Barge hoses are connected. What is the pumping pressure?
- The pumping pressure is 3 bars. Start pumping slowly.
- Are you receiving?
- Yes, I am receiving.

  ……..
  [not / a / do / pressure / exceed / of / of / bunker line / 3 bars]
- Pressure steady at 3 bars.
- ……
  [tank / we / reached / 90% of / have / capacity / a]
  Decrease pumping rate.

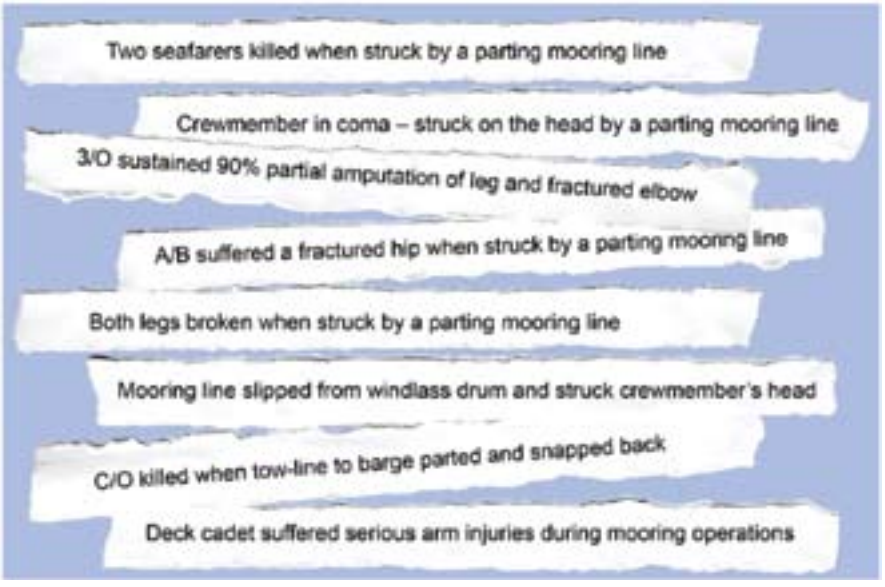
- I am decreasing pumping rate.
- 300 tones received – stop pumping. Disconnect the barge hoses.
- Barge hoses are disconnected.

E. Write a message marker for the following SMCPs.

1. ..... Containers with hazardous goods adrift at your wake.
2. ..... I require oil clearance assistance.
3. ..... Oil clearance operation in progress inside harbour waters.
4. ..... I intend to alter my course.
5. ..... The visibility is poor.
6. ..... The ship ahead of you is not under command.
7. ..... What is the depth in the outer fairway?
8. ..... The depth in the outer fairway is 20 meters.
9. ..... Reduce speed to five knots.
10. ..... The wind direction is NE force Beaufort 6.

5. Understanding mooring incidents

A. What type of accident do the following extracts / headings refer to?



B. Look at the extracts / headings above and fill in the missing verbs in the vocabulary usage table.

A mooring line can...	_____
	_____ somebody (on the head)
	_____ back
The victim can...	_____ serious injuries
	_____ or break a hip / leg / arm, etc.

C. What is shown in the following pictures[1]? Match the sentences below to the pictures (there is one extra sentence you will not need to use).

- ☐ Mooring station with effective hazard markings.
- ☐ Ropes correctly stowed off deck.
- ☐ Mooring equipment that is severely wasted.
- ☐ Ropes badly stored on wet deck.
- ☐ Well painted but poorly highlighted mooring station.

(a) 

(b) 

(c) 

(d) 

D. Read about the following incident and fill in the missing phrases.

efficient mooring arrangements	a hard hat
successful	during cargo operations

Who is at the mooring station?

A vessel moored alongside (1)..... was fully laden with her deck level below the dock level. It was noticed from the quayside that the forward spring was caught under a padeye located on the ship's side. An attempt was made to free the line by slacking it on the windlass but was not (2)..... .

1. Text and pictures from "Understanding Mooring Incidents", UK P&I Club, *Loss Prevention News*, Jan. 2009.

The line was then heaved taut in the hope that it might jerk free. When the line did free itself, the tension it was under caused it to oscillate up and down, passing 5 feet inboard of the ship's rail and striking a young engineering apprentice in the head.

The engineering apprentice was not involved in the operation and nobody involved was aware of his presence until after the accident. He was also not wearing (3)..... ..... . This incident highlights the need for control over people present at mooring stations, the wearing of PPE and (4)..... ..... .

Glossary

padeye	a fitting having an eye or ring to which a wire rope or line can be secured / attached
taut	stretched tightly or pulled back; not slack
jerk	move with a quick, sharp, sudden movement
oscillate	swing back and forth in a regular rhythm

6. Accident case: Slippery when wet

A. Read the case below and fill in the missing words in the summary sentences that follow.

Slippery When Wet

(From MAIB Safety Digest 2007)

Narrative

The duty AB had just come on duty in port when he was assigned to lashing/unlashing operations. This involved using a portable aluminium ladder to climb on top of containers to carry out the required task. The AB was alone and unassisted during this task.

The weather was overcast; in fact it had rained recently, leaving the decks wet and slippery.

The Lessons

1. The Code of Safe Working Practices for Merchant Seamen stipulates that portable ladders should be properly secured against slipping or shifting, yet this was not practised.

The AB propped the portable ladder against the container and, without securing it, climbed up to lash the container. The ladder slipped from underneath him. The AB fell from the top of the container and landed on his feet, which resulted in a compound fracture to his left leg.

As he was working alone, there was nobody to assist him immediately. However, he was fortunate that his personal radio survived the fall and this enabled him to call for assistance. Being in port, he was also lucky to have immediate access to medical attention.

2. If working at a height of more than 2 metres, a safety harness with a life line should be worn. However, as in this case, where this was not possible due to the nature of the work involved, consideration should be given so that at least two people are involved in this kind of operation.

1. The accident happened in ..... .
2. The duty of the AB was to ..... a container.
3. The AB fell off a ..... and broke his leg.
4. He used a portable ladder which he hadn't ..... .
5. The decks were wet and ..... due to prior rain.
6. He used his ..... to call for assistance.
7. The injured man was given ..... attention relatively quickly because the vessel was in port.
8. We was working at a significant height but a safety ..... could not be used in this particular case.
9. There are two things that should have been done: firstly, securing the ladder against slipping and secondly, ... two people to this operation / duty.

B. The following phrases come from the text. What do they mean? Choose the correct alternative.

1. "he was assigned"
   a. he was given some work (a task) to do
   b. he was relocated to another duty
2. "unassisted"
   a. isolated
   b. not helped by anyone
3. "propped (the ladder) against (the container)"
   a. attached (the ladder) to (the container)
   b. supported (the ladder) by leaning it against (the container)
4. "stipulates"
   a. analyzes in depth
   b. states clearly and firmly how something must be done
5. "consideration should be given"
   a. careful thought (when you are planning or deciding something) should be given
   b. priority (when you are planning or deciding something) should be given

C. Imagine you are calling the Port Authorities to ask for hospital transfer for the injured seafarer. They ask you about the type of injury and the type of medical assistance that is required. In pairs, act out the communication.

D. Imagine you are the Chief Officer on the particular vessel. An investigator from the Coast Guard is asking you what each member of the crew was doing at the time of the accident. In pairs, ask and answer about different members of the crew.

e.g. What was the Bosun doing at the time of the accident? He was.....

7. Terminology Work

A. What tools / objects can you see in the pictures below? Write their names. For extra help you can use the words in the box.

drill	chuck	bit	hammer	mallet
bolt	nut	washer	spirit level	head
thread	nail	screw	vice	scissors
spanner/wrench	ladder	chisel	file	step
pliers	hacksaw	rung	roller	screwdriver
stepladder	paintbrushes	adjustable wrench/monkey wrench		

B. Draw arrows to match the injury to the cause and the prevention.

Injury	*Cause*	*Prevention*
Back strain	Sharp machinery	Wear safety boots
Eye injuries	Wet and oily decks	Wear protective goggles
Hand cuts	Lifting heavy objects	Wear proper gloves
Broken arms and legs	Dust, spark, chemicals	Use hoists to lift properly

C. Write up the missing words in the following first aid instructions.

FIRST AID: Burns

Cool the burn down. Pour large amounts of water for at least 10 minutes over the burn. Explain what you're doing to the casualty, r _ _ _ _ _ _ e them and make them comfortable. Remove any clothing around the burned area unless it is directly over the burn or stuck to the s _ _ n. Do not put any c _ _ _ _ s, oils or lotions onto the burn. Loosely cover the burn to protect it from i _ _ _ _ _ _ _ n; do not wrap the wound up t _ _ _ _ _ y, do not encircle the wound with the covering.

FIRST AID: Unconscious but breathing

Place victim on their side to protect their breathing. Do not move the victim if you suspect they've hurt their b _ _ k or neck, unless their breathing is noisy and their mouth is blocked with blood or v _ _ _ t. If you do so try to keep their head in alignment with their neck. When victim is on their side, check for signs of c _ _ _ _ _ _ _ _ _ n, i.e. coughing, movement and normal breathing. Check for a p _ _ _ e at the neck. If the victim is b _ _ _ _ _ _ g, press firmly on the wound. Continue to check that the victim is breathing normally every minute or so. This is the most important thing to remember.

D. Fill in the missing words.

notices	validity	ventilated	confirmed	performing
approved	enclosed	duration	satisfied	good

Permit-to-work

Work to be done _____ _____

Period of (1)…….. of permit _____

Location _____

Person in charge of the work _____

Persons (2)…… the work _____

Responsible officer (*signature*) _____

Date _____ Time _____

Master's signature _____

Date _____ Time _____

Entry into (3) ..... or confined spaces

_____ Space thoroughly (4) ……..

_____ Atmosphere tested and found safe

_____ Rescue and resuscitation equipment available at entrance

_____ Responsible person in attendance at entrance

_____ Communication arrangements made between person at entrance and those entering

_____ Access and illumination adequate

_____ All equipment to be used is of a(n) (5)…… type

_____ When breathing apparatus is to be used:
(1) familiarity of user with apparatus is (6) ……
(2) apparatus has been tested and found to be satisfactory

Machinery or equipment

_____ Removed from service / isolated from sources of power or heat
_____ All relevant personnel informed
_____ Warning (7) …….. displayed

Hot work

_____ Area clear of dangerous material and gas free
_____ Ventilation adequate
_____ Equipment in (8) ……. order
_____ Fire appliances in good order

I am (9) …….. that all precautions have been taken and that safety arrangements will be maintained for the (10) ……. of the work.

Signature of person in charge: _____

E. Read about the first stage of the bunkering procedure and write up the missing words. The first letter is provided.

The Bunkering Process
(Text from www.marineinsight.com)

The chief officer along with the crew should ensure that the barge is taken a_____ safely and a safe means of access is provided to the barge crew. Once the barge is safely alongside and the bunker man is in the Engine Control Room (ECR), the Chief Engineer and his assistant (say 3rd Engineer) should check important specifications and discuss the following things:

1. The r_____ of filling (not exceeding 300 t/hr)
2. The p_____ on the bunker line (generally not exceeding 3 bars)
3. The sampling procedure
4. Which oil to be taken first (In case of more than one grade of oil is to be taken)
5. Meaning of emergency stop s_____ (to be mutually well understood)

While this is being done, the other bunkering team on the deck is receiving the h_____ and connecting it to ship's flange. This operation is generally carried out with the first engineer (or 2nd/E) along with the fitter (or 5th engineer) actively participating.

F. Match to make full phrases.

1. Sound	☐ the tanks
2. Put fenders	☐ the crew
3. Connect	☐ warning signs
4. Decrease	☐ in position
5. Clean up	☐ barge hoses
6. Inform	☐ spill with SOPEP kit
7. Display	☐ precautions
8. Take	☐ pumping rate

G. The Chief Officer is checking with the Bosun if the ratings have completed the following tasks. Use the checklist below to ask about the duties and then answer yes if there is a tick (✓) or no if there is a cross (×) in the list.

Maintenance check list

• Mop the floor in the messroom	✓
• Scrape the rust off the hatch covers	✓
• Paint the railings	×
• Wash the deck	✓
• Check the mooring ropes for damage	✓
• Dress the wire ropes with grease	×
• Crop the worn ends of mooring ropes	✓
• Clean the anchor chain	×

e.g. *Have they mopped the floor in the messroom?*
Yes, they have.

H. What can you see in the following pictures? Write the phrases in the box as legends under the pictures.

scaffold plank	drain bucket	parted line	oxygen cutter	sand blasting	chipping hammer

(a) 

(b) 

(c) 

(d) 

(e) 

(f) 

I. Choose one of the pictures above and talk about the type of accident / injury that can happen. What PPE must be worn for the work done?

APPENDIX I
English for Marine Engineers

Part One

1. Workshop Tools

Lead-in: Which of the tools in the following drawings is used to...

1. drive in a nail?
2. drive a screw?
3. drill a hole?
4. cut metal?
5. cut or bend wire?
6. measure the diameter?
7. loosen a nut?

pliers

callipers

electric drill

hacksaw

screwdriver

combination spanner

hammer

In the following pages you will find ***hand tools*** useful in an engineer's workshop for repairing and maintaining machine parts, as well as ***machine tools*** for activities included in machining, like measuring, cutting, shaping, drilling, finishing, etc.

measuring

Feeler gauges
used for measuring narrow gaps or clearances; they consist of a number of thin blades

Screw pitch gauges
used for determining the pitch of screw threads

(pair of) Calipers
used for measuring thickness(es) and linear dimension; consist of two adjustable (in-turned or out-turned) legs

(pair of) Compasses
used for drawing circles and arcs and measuring distances between points; consist of two arms linked by a movable joint

Vernier calipers
used for precision measurement of small distances by comparing a fixed scale to a sliding one

Micrometer (calipers)
used for measuring small distances or thicknesses, typically for precision measurement of wires, spheres, shafts etc.

(pair of) Dividers
a measuring compass, especially one with a screw for making fine adjustments

1. Calipers (firm joint)
2. Compasses for setting and maintaining a precise radius
3. Beam and regular compasses
4. Chart dividers

cutting

Pliers
pincers with parallel flat jaws, used for gripping small objects and bending or cutting wire

Tinsnips or tin cutters
a pair of clippers for cutting sheet metal

Cutter
a tool for cutting

Side cutter
diagonal cutting pliers, used for cutting wire

Hacksaw
a saw with a narrow blade set in a frame, used for cutting metal

Cutting torch
a device that uses fuel gases and oxygen to cut metals

machining and ... hammering

Mallet
a hammer with a large wooden (or plastic) head

Straight-peen (or "pein") hammer
a hammer with a flat striking face on one end of the head for striking punches and chisels

Ball-peen (pein) hammer
a hammer with one end of the head flat and the other end rounded, used for forming soft metal

Centre punch
a small steel tool with a conical tip used to punch a small indentation at the location of the centre of a hole to be drilled

Cold chisels
tools with cutting edges used for cutting and shaping cold metal (they are struck with a hammer)

Fitter's vise (or vice)
a metal tool with movable jaws which are used to hold an object firmly in place while work is done

Conventional lathe
A lathe is a machine tool which turns cylindrical material, touches a cutting tool to it, and cuts the material in order to shape it. It is used to perform various operations such as sanding, drilling or deformation.

CNC lathe
CNC means Computer Numerical Control. This means a computer converts the design into numbers which the computer uses to control the cutting and shaping of the material.

Hand grinder (electric)
mechanical device which allows you to reshape, form, sharpen metal cutting tools or other tools

Bench grinder
a device with a rotating abrasive disc, used to grind, polish or cut metal and other materials

– Which of the mechanical devices above:

1. has a large wooden or plastic head?
2. is driven with a hammer or mallet in order to shape or work (soft) metal?
3. marks the spot you will drill and starts the hole?
4. can be used to cut wire and thin rods and also for bending and holding?
5. can be used for cutting thin sheet metal and comes in three basic types, straight, left hand and right hand?
6. is used for cutting and welding?

drilling

– Write the tool under each picture.

heavy duty drill, breast drill, electric drill, drilling machine, drill bits

(a) _____

(b) _____

(c) _____

(d) _____

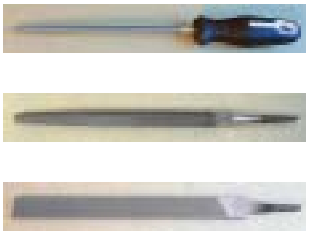
(e) _____

reaming

Reamer
After you drill a hole, you can finish it to an accurate dimension with the use of a reamer, a tool that can shape and enlarge holes with precision. To achieve the correct size and finish, you drill a hole to slightly undersize and then use a reamer.

1. Reamers
2. Spiral fluted machine reamer
3. Straight fluted chucking reamer

finishing: filing, scraping, rasping



Files
tools with a roughened surface, used for smoothing or shaping a hard material

1. Round file with handle
2. Triangular file
3. Flat file

Rasps
coarse files for use on metal, wood or other hard material

Scrapers
hand tools used for scraping off paint or other adherent matter

spanners / wrenches

- **Spanner** (British English) or **wrench** is a hand tool (sometimes adjustable) with a shaped opening or jaws for holding and twisting a nut or bolt.

Monkey wrench
a spanner with one fixed and one adjustable jaw, in some countries also called "French" or adjustable spanner

Pipe wrench
adjustable wrench with two toothed jaws for gripping and turning a pipe

Single German (open-ended) spanner
a tool with a U-shaped opening (or jaw) on one end for gripping and turning a nut or bolt

Double German (open-ended) spanner
a tool with fixed open jaws on both ends of the handle; it usually has different sized openings at each end

Ratchet wrench
a wrench activated by its handle through a hinged catch (pawl) that causes the wrench to rotate in one direction only (may be adjusted for either direction)

Ratchet ring spanners
a type of ring spanners whose end sections ratchet

Combination spanners
double-ended tools with one end being like an open-end spanner and the other end like a ring spanner. Both ends usually fit the same size of bolt.

Ring spanner (hex)
double-ended spanner, with an enclosed opening that grips the faces of the bolt or nut, usually with offset handles to improve access to the nut or bolt

Ratchet wrench and sockets
a wrench with an interchangeable socket to fit over a nut or bolt

Allen key (or hex key)
a (usually L-shaped) wrench for Allen screws

nuts and bolts

Bolts
long metal pins with a head that screws into a nut, used to fasten things together

Nuts
small flat pieces of metal, typically square or hexagonal, with a threaded hole through them for screwing on to a bolt

Washers
flat discs with a hole, placed beneath a nut to relieve friction, prevent leakage or distribute pressure

Taps (machine screw taps: taper, plug, bottoming)
used for cutting internal threads in metal, plastic or hard rubber

screws

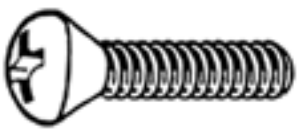
A. Study the two pictures below showing the types of screws. Then do the exercise that follows.

Types of screw head

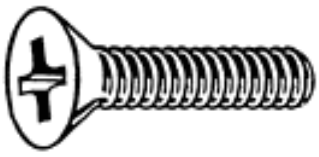
Types of machine screw drive

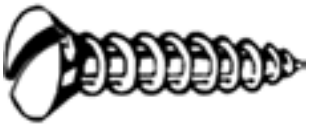
Now, match the pictures to the type of screw.

1. Philips flat machine screw
2. hex head slotted sheet metal screw
3. slotted oval sheet metal screw
4. Philips oval machine screw
5. slotted flat machine screw

(a) 

(b) 

(c) 

(d) 

(e) 

Screwdriver
a tool with a shaped tip that fits into the head of a screw to turn it

Spiral screwdriver
ratcheting screwdriver with a "spiral ratchet" mechanism to turn pressure (linear motion) into rotational motion

B. Quiz. Write the tool next to the description. First try this exercise without looking at the list below. Then match to the words provided in the box.

1. a tool with a narrow fine-toothed blade set in an adjustable frame, used for cutting metal
2. a tool with a heavy metal head mounted at the end of a handle, used for breaking things and driving in nails
3. a tool with which you can shape and enlarge holes with more precision than a drill; it cannot be used to start a hole
4. a device resembling a compass, used for dividing lines and transferring measurements
5. a tool which rotates a grindstone at high speed to sharpen tools
6. a cutting tool used to create holes, held in a drill which rotates it
7. sets of thin steel strips of accurate thicknesses; they measure the gap between two surfaces
8. a piece of equipment for measuring something by adjusting movable arms to enclose it
9. a machine useful for fabricating parts that have a circular cross section; it rotates a part against cutting tools, controlling their position
10. a coarse file for use on metal, wood, or other hard material
11. an instrument used for cutting as well as welding metal
12. pincers with parallel flat jaws, used for gripping small objects or bending wire
13. a small flat piece of metal or other material, typically square or hexagonal, with a threaded hole through it for screwing on to a bolt
14. tools used for cutting threads in metal for inserting a screw

Cutting torch	Calipers	Lathe	Dividers
Pliers	Rasp	Reamer	Drill bit
Feeler gauges	Bench grinder	Hacksaw	Hammer
	Taps	Nut	

C. Naming game. Try to identify the tools you know. In groups of three, take turns and quickly say what hand tools you can see. The one who finds more tools wins.

D. What is shown in each picture?

sand paper, digital calipers, rubber mallet with wooden handle, grip pliers, chipping hammer, mini lathe

(a) 

(b) 

(c) 

(d) 

(e) 

(f) 

E. Describe what is happening in the pictures.

Student A: match the phrases to the pictures and write them in the space provided; then help your partner describe the pictures to you by giving him/her some key words.

1. processing material on a drilling machine
2. measuring with a micrometer
3. marking with a centre punch
4. cutting with a hacksaw
5. loosening a nut with an adjustable wrench
6. measuring an outer diameter with Vernier's calipers
7. working on the lathe

Student B: say what is happening in each picture. If you need help, ask your study partner to provide key words for each picture. Take notes and write them next to each picture before you start your description.

(a) 

.....
.....
.....
.....

(b) 

.....
.....
.....
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(c) 

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(d) 

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(e) 

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(f) 

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(g) 

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Review of machine and hand tools used in metal work

Engine room workshop

The workshop is found on the top platform of the engine room. There is a ***working bench*** in it and the workshop usually contains the following machines (for fitting and maintenance purposes):

⇨ ***Lathe***
⇨ ***Drilling machine***
⇨ ***Grinding machine***
⇨ ***Bench vice***

a) Which of the items mentioned above are described below? Write them next to each description (one has been done as an example).

1. ……: a strong worktable in the workshop, providing workspace and tool storage.
2. ……bench vice ……: a fitter's vice fixed to a workbench.
3. ……: a motor driven device fitted with an end cutting tool that is rotated with sufficient power either to create a hole or to enlarge an existing hole in a solid material.
4. ……: a machine tool that uses a rotating abrasive wheel to change the shape or dimensions of a hard, metallic workpiece.
5. ……: a machine tool which turns cylindrical material, touches a cutting tool to it, and cuts the material in order to shape it.

b) Identify the above-mentioned items in the pictures below. Write the names below each picture.

(a)

(b)

(c)

(d)

(e)

c) What is the name of the items shown in the following pictures? Match the pictures to the words. Draw arrows.

Machine accessories

(a) 

Bolts

Nuts

Washers

Taps (machine screw taps: taper, plug, bottoming)

(b) 

(c) 

(d) 

d) What are the names of the tools shown in the pictures? Circle the correct name of each tool.

straight-peen hammer / ball-peen hammer

mallet / hammer

pliers / screwdriver

callipers / feeler gauges

hacksaw / cutting torch

scrapers (to scrape off paint) / cold chisels (struck by a hammer to cut and shape cold metal)

e) Match (draw arrows).

Filing

Triangular file Flat file Rasp

f) Which tool do you use to do the following actions? Circle the correct tool.

1. _____ reamer / file_____ ⇨ shape and enlarge holes
2. _____ wrench / hacksaw _____ ⇨ cut metal
3. _____ pliers / hammer_____ ⇨ cut or bend wire
4. _____ spanner / washer_____ ⇨ gripping and turning a nut and bolt
5. _____ screwdriver / hammer_____ ⇨ drive in a nail
6. _____ feeler gauges / calipers _____ ⇨ measure the diameter
7. _____ pliers / rasp _____ ⇨ smooth, file metal and other hard material
8. _____ bolts / feeler gauges _____ ⇨ measure narrow gaps and clearances

g) Quiz: Choose the correct word to fill in the blanks.

1. Tools worked by air under pressure (such as chipping and hammering tools): …… **tools**
   pneumatic / pressurized
2. A machine for the removal of metal by feeding a workpiece through the periphery of a rotating circular cutter: …… **machine**
   press / milling
3. A tool used to drive rivets (rivet: a permanent mechanical fastener): …… **gun**
   nailing / riveting
4. Brushes, grinding wheels, sand paper, etc. that you use to abrade surfaces: ……
   abrasives / scrapes
5. Drill bitts, reamers, saw blades, etc. and other replaceable items that you use in cutting tools: **cutting tool** ……
   usables / consumables

h) Look at the following pictures and match the items to their names (there are two extra names you won't need to use).

bench grinding wheels	milling machine	abrasive brushes	
coupling for bunker hose	cutter	T-bolt clamp	hose nozzle


(a)


(b)


(c)

(d)

(e)

i) What tools do we use to…

…tighten / loosen / twist (a nut, bolt)?
…drive in (a screw, a nail)?
…drill a hole?
…cut / weld metal?
…measure?
…grind?
…sharpen?
…polish?
…rivet?
…saw?

2. Marine Diesel Engine Components

Lead-in: Check what you know.

A. Discuss in class and choose the correct alternative.

1. The Diesel engine is...
   a) an internal combustion engine
   b) an external combustion engine
2. The Diesel engine is...
   a) a spark ignited engine
   b) a compression ignited engine
3. Marine Diesel engines burn...
   a) heavy fuel oil
   b) petrol
4. Two-stroke marine Diesel engines work on...
   a) slow speed – up to 300 rpm
   b) high speed – over 900 rpm
5. In the figure below, find the following and show them with an arrow
   a) the crankshaft
   b) the pistons
   c) the cylinders
   d) the flywheel

6. This is a picture of main engine spare parts. What parts can you identify?
   a) Piston rings, bearing and connecting rod
   b) Cylinder liners, piston and piston rod

7. This is a picture of...
   a) a purifier room
   b) main engine cylinders

B. Vocabulary assessment.

i. Use the vocabulary development scale to rate the following words:

5 can explain and use in different contexts
4 use in a limited way in speaking/writing
3 understand the "gist" of it
2 recognize but don't understand
1 is unknown to me

combustion	operation	cycle
ignition	strokes	slide
component	friction	compression
rotate	reduce	principle
reciprocate	support	consist of

ii. Search the vocabulary assessment list to find the words defined below:

- move back and forth alternately: ……..…..
- the process of burning: ……
- travels, a series of repeated upward or downward movements: ……
- move in a circle, turn around an axis: ……

Diesel Engines

The Diesel engine is a type of internal combustion engine. This means that the combustion of the fuel takes place inside the cylinder of the engine. The principle of operation of a Die-

sel engine is based on the fact that when the air in the cylinder is compressed, its pressure and temperature rise. Therefore, when the fuel is sprayed into the cylinder, it is self-ignited because of the compression heat.

There are two types of Diesel engines:

- the ***four-stroke diesel engine*** and
- the ***two-stroke diesel engine***.

In the four-stroke Diesel engine one cycle of operation of the engine is completed in four strokes of the piston. In the two-stroke Diesel engine the cycle is completed in two strokes of the piston.

The main parts of a Diesel engine are

– the pistons,
– the piston rods,
– the cylinders,
– the connecting rods,
– the crankshaft,
– the camshaft and
– the cylinder head with the valves.

C. Look at the following pictures of the main parts of Diesel engines and write the appropriate term under each picture. If you need help, look at the words in the box below.

(a) 

(b) 

(c) 

(d) 

(e) 

(f) 

(g) 

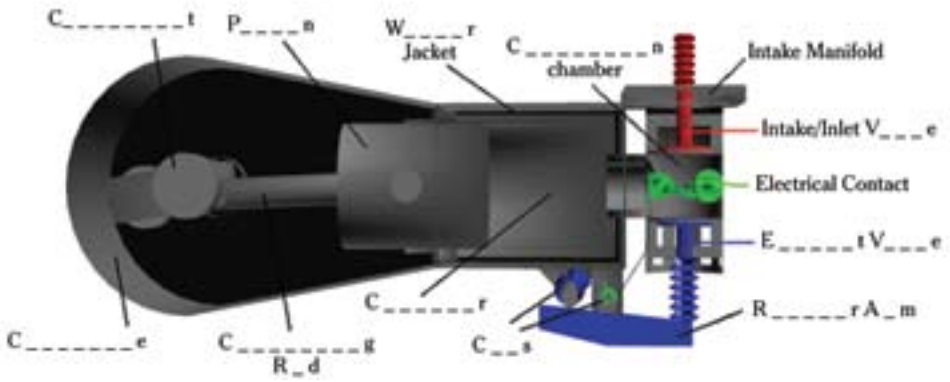
(h)

(i)

(j)

camshaft / bearings / piston / piston rings / connecting rod / bedplate / crankshaft(s) / frame / cylinder head / cylinder liner

D. i. Write up the names of the components in the following graph.
ii. Work with your partner to say what each of these parts of the engine does. In your sentences use verbs such as those in the box below:



rotate, reciprocate, connect, change, compress, give motion, reduce, support, open, slide

E. Read the passage below and insert the correct form of the above mentioned verbs in the blanks. Use each verb only once.

The ***piston*** _____ inside the ***cylinder***. It _____ the air and _____ to the ***connecting rod***.

The cylinder has a ***cylinder liner*** which protects the cylinder and _____ friction.

The connecting rod _____ the piston to the ***crankshaft***. It is joined to the piston with the ***gudgeon (piston) pin*** and to the crankshaft with the ***crank pin*** and ***bottom end bearing***. The connecting rod gives motion to the crankshaft which _____ the reciprocating motion of the piston into rotating motion. The crankshaft consists of the

cranks, ***crank webs, crank pins*** and ***crank journals***. It _____ inside the crankcase which houses and _____ the crankshaft.

In two-stroke diesel engines the piston is attached to the piston rod which reciprocates in the ***stuffing box***. In these engines the ***crosshead*** connects the piston rod to the connecting rod. The crosshead _____ on the ***guider***.

The camshaft takes motion from the crankshaft through ***gear wheels*** or a ***chain*** and it _____ and closes the ***inlet*** (intake) and ***outlet*** (exhaust) valves in order to operate the cycle. The shaft is circular but the cams have an irregular shape. The inlet valve, exhaust valve and fuel injection valve are all housed (fitted) in the ***cylinder head***. The inlet valve is similar to the exhaust valve while the fuel valve is rather different in design.

F. Match the parts of a diesel engine to their function:

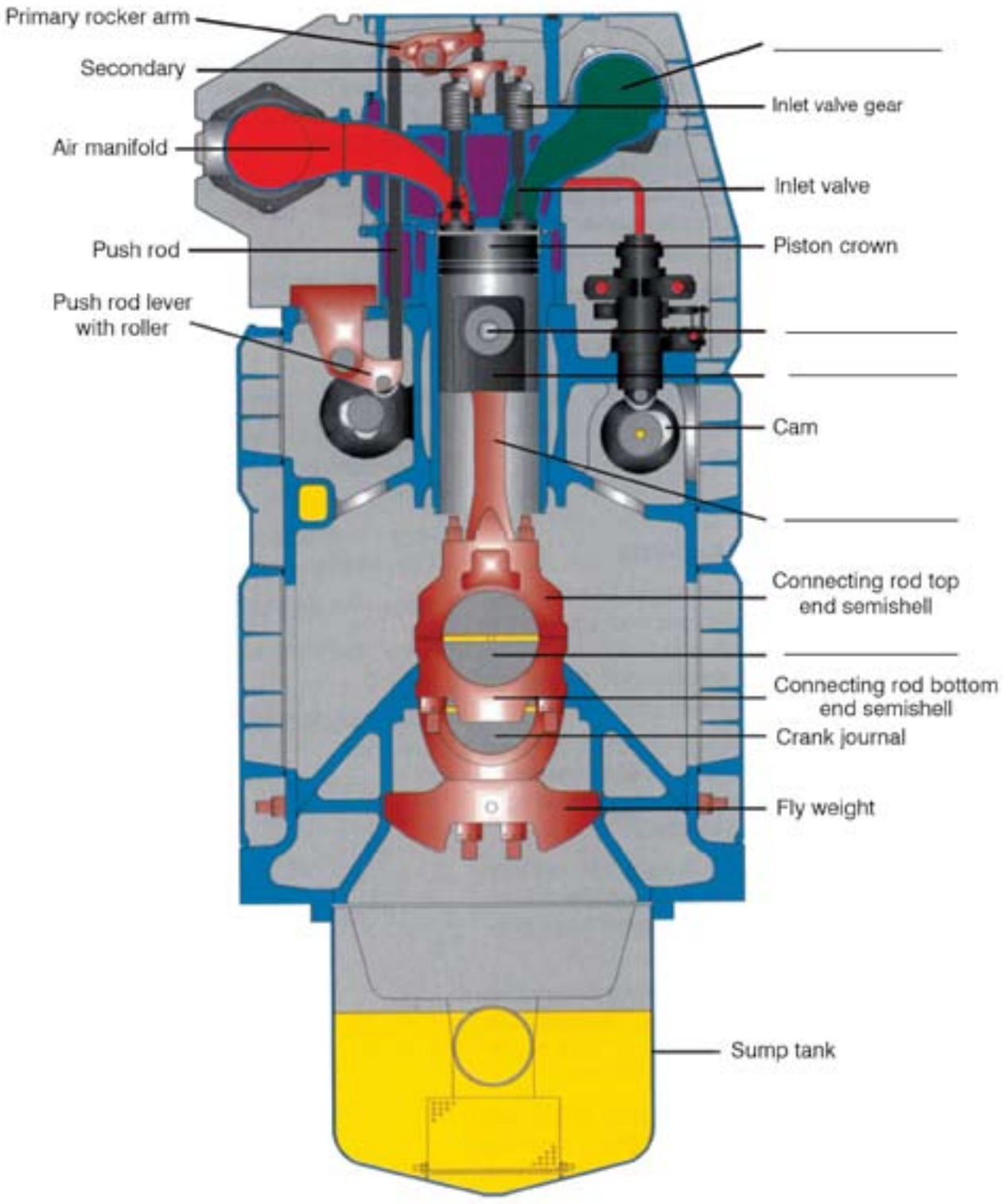
1. camshaft	_____ it gives rotating motion to the crankshaft
2. piston	_____ it rotates and gives motion to the propeller
3. cylinder liner	_____ it connects the piston rod to the connecting rod
4. connecting rod	_____ it supports the whole engine
5. gudgeon pin	_____ it opens the valves
6. crankshaft	_____ it reduces friction
7. crank pin	_____ it reciprocates in the stuffing box
8. crosshead	_____ it compresses the air
9. bedplate	_____ it connects the piston to the connecting rod
10. piston rod	_____ it connects the connecting rod to the crankshaft

G. Find the terms that the following definitions correspond to.

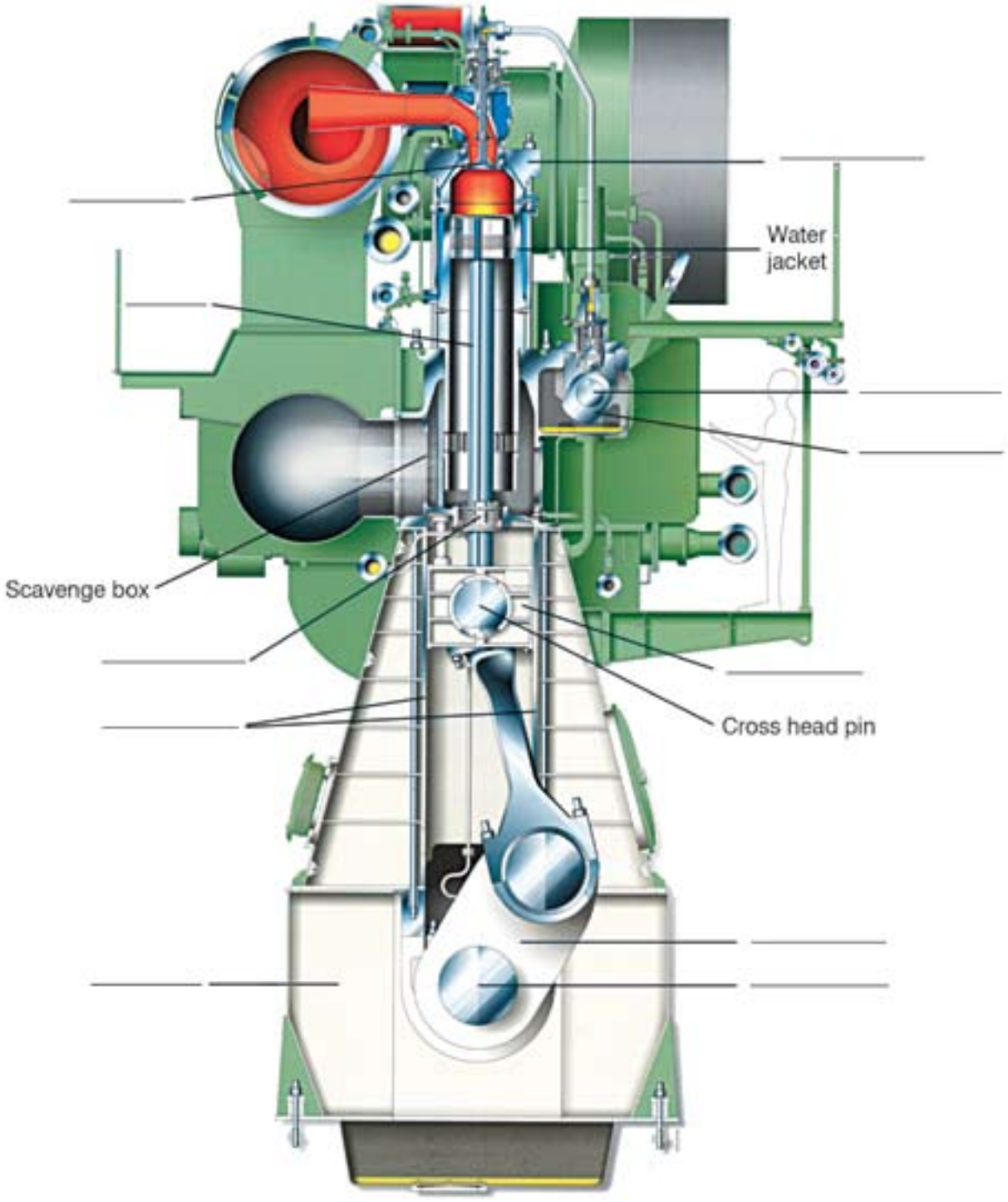
1. The crankshaft rotates in it: _____
2. The air is drawn into the cylinder through this valve: _____
3. The lubricating oil is in here: _____
4. The crosshead slides on them: _____
5. The gases escape through this valve: _____
6. It cools the cylinder externally: _____
7. The valves are fitted in it: _____
8. Parts of the camshaft having irregular shape: _____
9. It connects the piston rod to the connecting rod: _____
10. The camshaft opens the valves with the help of this rod: _____

H. Look at the cross section of a four-stroke Diesel engine and a two-stroke Diesel engine on the next pages. Work with your study partner to insert the following missing terms.

- Crankpin
- Cylinder head
- Connecting rod
- Stuffing box
- Piston
- Crank web
- Bedplate
- Piston rod
- Guides
- Cam
- Crosshead
- Crank journal
- Air manifold
- Gudgeon pin
- Camshaft
- Exhaust valve



Four-stroke Diesel engine

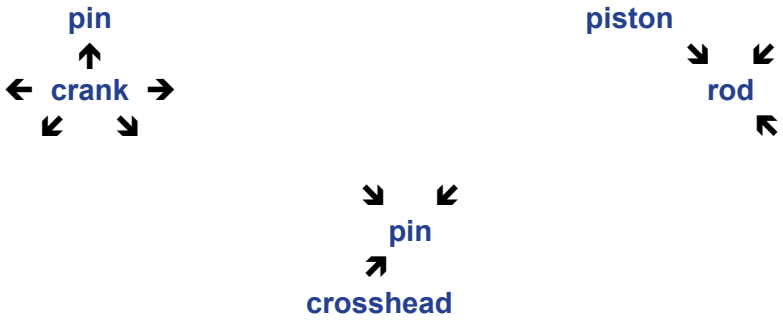


Two-stroke Diesel engine

• We can form compound nouns by combining two words

e.g. crank + pin = crank pin
piston + rod = piston rod

I. Complete the missing words in the diagrams below:



J. Form more compound nouns by matching the words in the 1st column with appropriate ones in the 2nd column.

1. air	_____ board
2. water	_____ proof
3. free	_____ list
4. fly	_____ tight
5. water	_____ ship
6. fire	_____ plate
7. check	_____ weight
8. diesel	_____ proof
9. light	_____ oil
10. bed	_____ line

The Most Powerful Diesel Engine in the World.

Two-stroke Diesel engines such as the Wärtsilä-Sulzer RTA96-C and the MAN B&W K108ME-C, are the most powerful Diesel engines in the world today, designed primarily for very large container ships. One type of the RTA96-C, for instance, powers Emma Maersk, a 11,000 TEU container vessel.

The Wärtsilä-Sulzer RTA96-C turbocharged two-stroke Diesel engine is available in 6 through 14 cylinder versions. Some facts on the 14 cylinder version[1]:

Total engine weight:	2300 tons
	(The crankshaft alone weighs 300 tons)
Length:	89 feet
Height:	44 feet
Maximum power:	108,920 hp at 102 rpm
Fuel consumption:	1,660 gallons of heavy fuel oil per hour.

1. Source of text and pictures: "The Most Powerful Diesel Engine in the World!" by Todd Walke.

– Look at the following pictures showing the building of the RTA96–C. Put the correct caption under each picture:

- Pistons
- Piston rods
- Piston and piston rod (the large square plate at the bottom is where the structure attaches to the crosshead)
- Cross section of the RTA 96–C
- The completed 12–cylinder engine
- The cylinder deck (10–cylinder version)
- The crankshaft sitting in the bedplate
- The bearings; crank and rod journals are 38” in diameter and 16” wide.

(a)

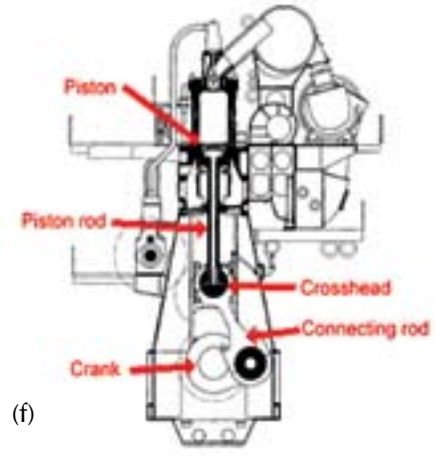
(b)

(c)

(d)

(e)

(f)



(g) 

(h) 

3. Follow-up

A. Fill in the missing words. The first letter is given.

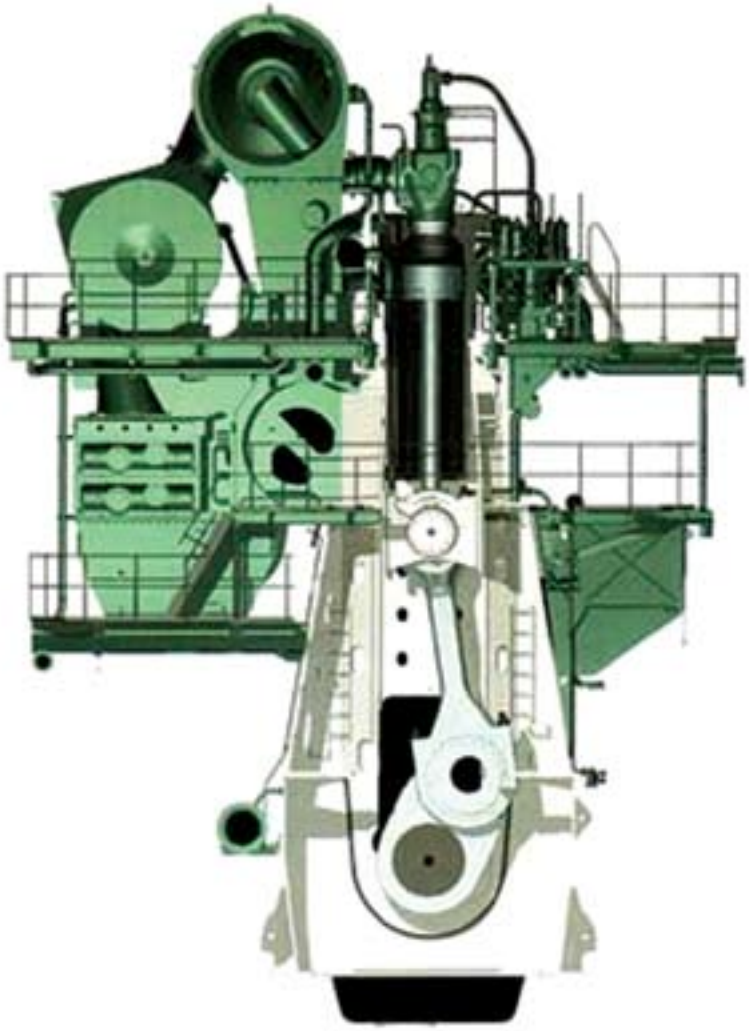
1. The c_____ liner forms the cylindrical space in which the piston reciprocates.
2. The b_____ is the foundation on which the engine is built; it supports the weight of the rest of the engine and houses the huge crankshaft.
3. The c_____ carries the cams which operate the fuel pumps and exhaust valves.
4. The c_____ is the part of an engine which translates reciprocating linear piston motion into rotation.
5. The Diesel engine is a CIE: C_____ Ignition Engine.

B. Ask and answer the following questions with your partner orally.

1. What / piston / do?
2. Where / piston rod / reciprocate?
3. Where / crankshaft / rotate?
4. Where / be / valves?
5. What / gudgeon pin / do?
6. What / the cylinder liner / do?
7. What / the crank pin / do?
8. What / open / valves?

C. Look at a two-stroke power plant. How many components can you show on this picture?

1. Draw arrows and write the names of the parts on the picture.
2. Use the picture to make a presentation. Show as many parts as you can to your class and try to explain their purpose.
   e.g. This is the …. It …. It is connected to ….



D. Marine Engine Types

Task: understand information on marine engine types and the particular features of a marine engine.

Lead-in: check what you know.

a) There are four main types of marine engines. Match the following words to find out:

The diesel _____	turbine
The steam _____	plant
The gas _____	engine
The marine nuclear _____	turbine

b) Which one of the four types of marine engines above is not used in merchant ships, but is mainly used in submarines?

i. Propulsion Diesel Engines

a) What do the abbreviations in the chart that follows stand for?

RPM .....

dwt .....

Ro-Ro .....

Study the following chart on propulsion diesel engines. Then do exercises (a) and (b).

	High-Speed	Medium-Speed	Low-Speed
RPM	Above 960	240-960	Below 240
Ship Types	Harbour tugboats Ships for inland navigation	Middle-size ships Seagoing tugs Ro-Ro ships	Ships over 30,000 dwt

b) Use the chart to fill in the text with the missing words.

Engine types[2]

Propulsion diesel engines can be divided into three groups:

– High-speed four-stroke diesel engines, RPM above 960.
– Medium-speed four-stroke diesel engines, RPM ranging 240-960.
– Low-speed (crosshead) two-stroke diesel engines, RPM range below 240.

The fast-running and medium-speed engines drive the propeller after being reduced in RPM in a reduction gearbox. The fast-running engines are found in small ships, such as (1)……, and ships for inland navigation.
Medium-speed engines are found in the various middle-size ships and (2)……..., or in ships where the height of the engine room is limited, such as (3)…….. . This engine also drives the propeller after being reduced in RPM.
The slow-running engine is directly coupled to the propeller, and is normally installed in (4)…… .

ii. A presentation of the MAN Diesel 48/60B engine[3]*. Listen to the presentation and do the following tasks:*

1. Circle the correct one:
   a) The engine has *14 / 16 / 18* cylinders.
   b) Its power is at *1015 / 1050 / 1500* kilowatts per cylinder.
   c) It is a *2-stroke / 4-stroke* engine.

2. What fuel does the 48/60 use? (tick ☑ as many as you can hear)
   a) crude oil
   b) heavy fuels
   c) kerosene
   d) bio-fuels

2. Source: Van Dokkum, K. (2005). *Ship knowledge: Covering ship design construction and operation*, 2nd Ed. The Netherlands: Dokmar.
3. A Virtual Tour of the 48/60B, GMD Multimedia, MAN Diesel, 2009.

Part Two

1. Diesel Engine Operation

Lead-in: Check what you know.

I. The engine room

A. With your partner, write up the missing words.

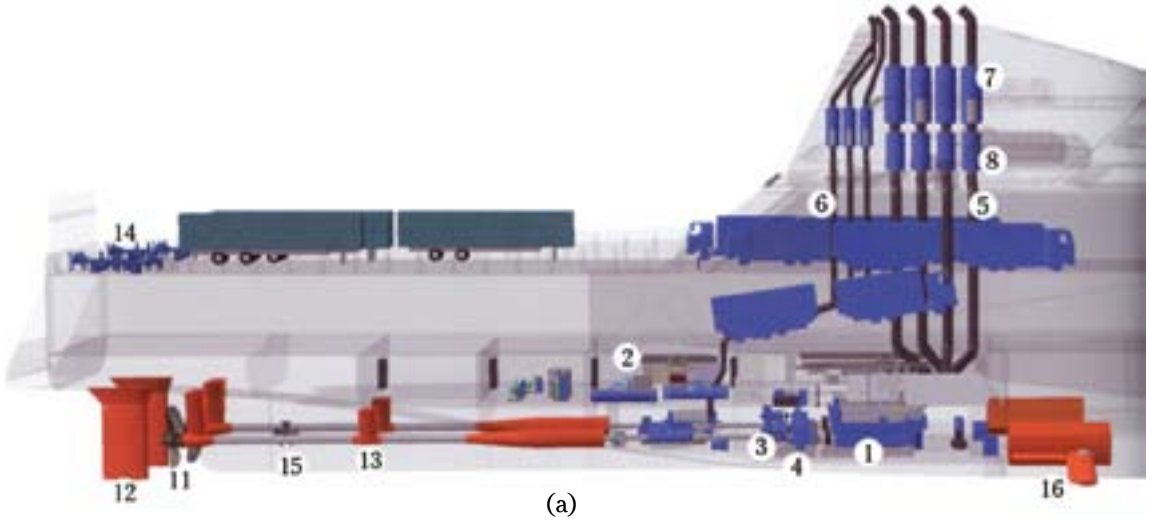
All engine rooms consist of at least:

• Main engine(s) (for p _ _ _ _ _ _ _ _ n) • Auxiliary engines (for power g _ _ _ _ _ _ _ _ _ n) • Cooling water system • L _ _ _ _ _ _ _ _ _ g oil system • Fuel system • Compressed air system (starting-, control- and working air) • Drinking w _ _ _ r system • Sewage system • Bilge system	• B _ _ _ _ _ t system • Boiler (heating of tanks, accommodation, etc) • Refrigerating system • F_ _ e-f _ _ _ _ _ _ g system • Storage t _ _ _ s for lubricating oil • Hydraulic oil • Fuel oil • S _ _ _ e parts store • C _ _ _ _ _ l room • Workshop

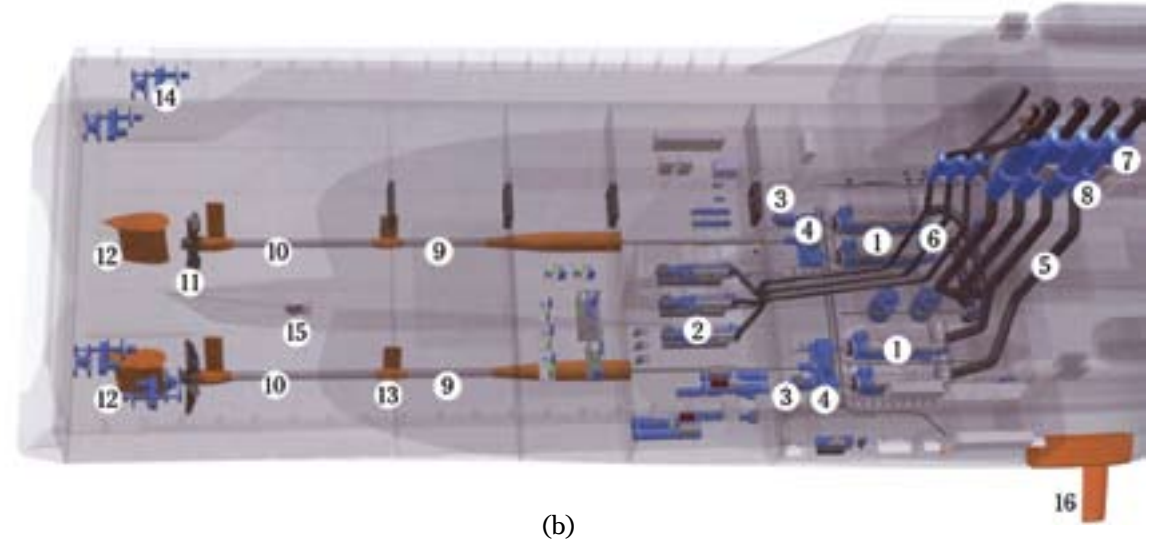
B. Look at the 3-D drawing of the engine room and the propulsion system of a cruise ship on the next page. Identify the components shown and write them down. The names listed in the box will help you.

1. .....
2. .....
3. Shaft generator (2)
4. .....
5. .....
6. Auxiliary exhaust lines
7. .....
8. .....
9. .....
10. Tail shaft
11. .....
12. .....
13. Intermediate shaft bearing
14. .....
15. .....
16. .....

Shafting
Stern thruster
~~Auxiliary exhaust lines~~
Main exhaust lines
Gearbox
Auxiliary diesel generators
~~Tail shaft~~
Main engines (4)
CPP (Controllable Pitch Propeller)
Mooring winch
~~Shaft generator (2)~~
Silencer
Stabilizer
Rudder (2)
Exhaust gas boilers / economizers
~~Intermediate shaft bearing~~



(a)



(b)

II. Diesel engine components

A. Listen about a marine Diesel Engine and answer the questions.

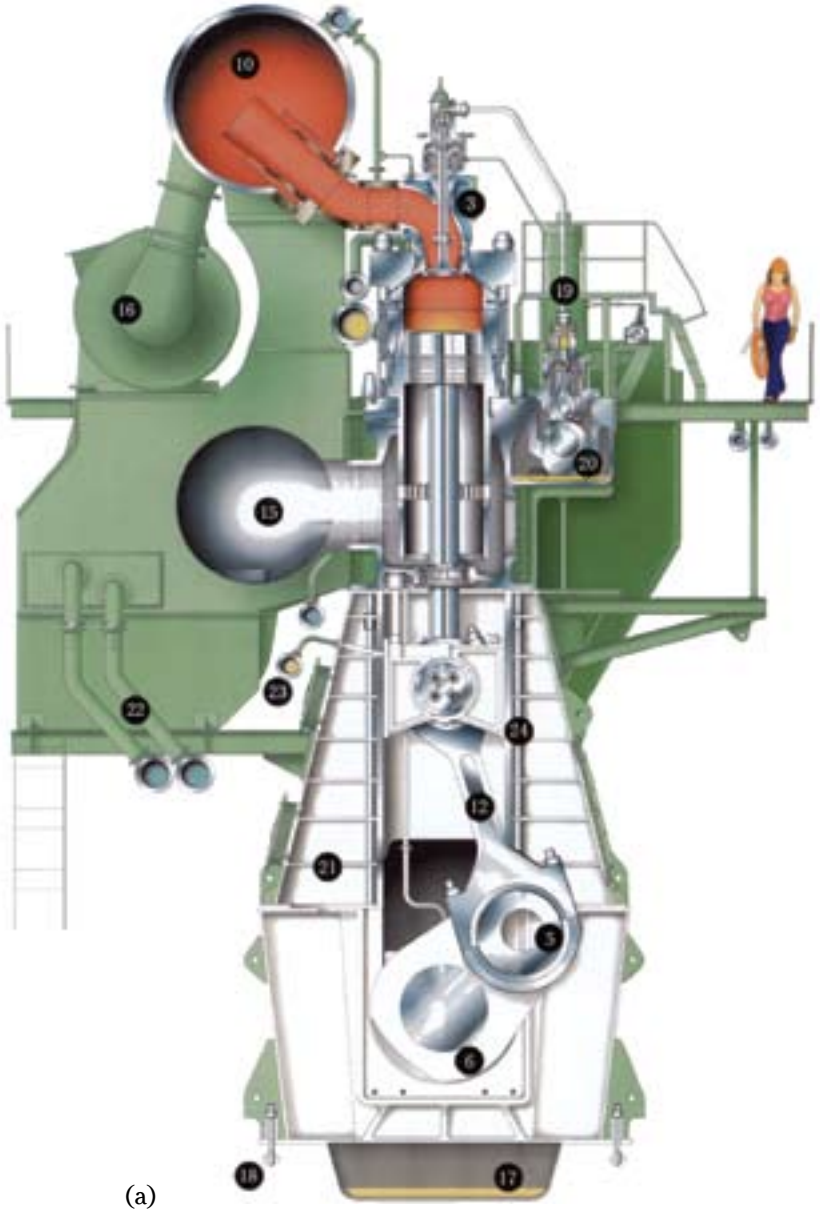
1. What types of ships is it used on?
2. What is its horsepower?
3. What is its weight?
4. What is its daily fuel consumption?
5. What is the maximum speed it can propel vessels to?
6. What are the components mentioned in the clip? Underline.

Valves	Scavenge box	Piston	Piston rod
Crankshaft	Crosshead	Camshaft	Cylinder

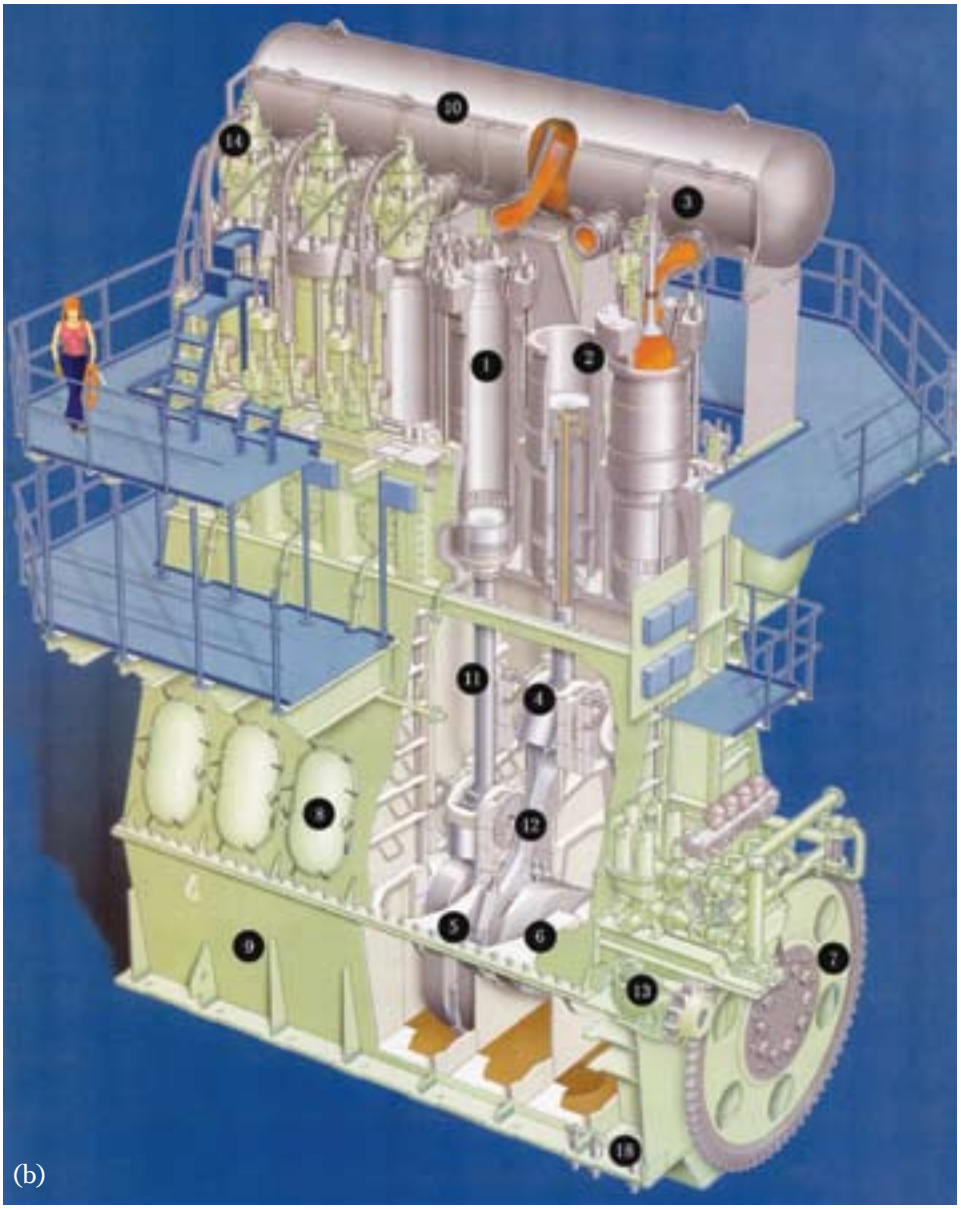
B. In pairs, identify the components of the engine in the pictures that follow. It is a low speed crosshead engine for a bulk carrier or a tanker.

Student A: Write the names of the components in the numbered list below. If you need help ask Student B for a suggestion.

1. ……
2. ……
3. ……
4. ……
5. ……
6. ……
7. ……
8. ……
9. ……
10. exhaust gas receiver
11. ……
12. ……
13. turning gear
14. ……
15. ……
16. ……
17. ……
18. foundation bolt
19. ……
20. ……
21. ……
22. ……
23. ……
24. ……



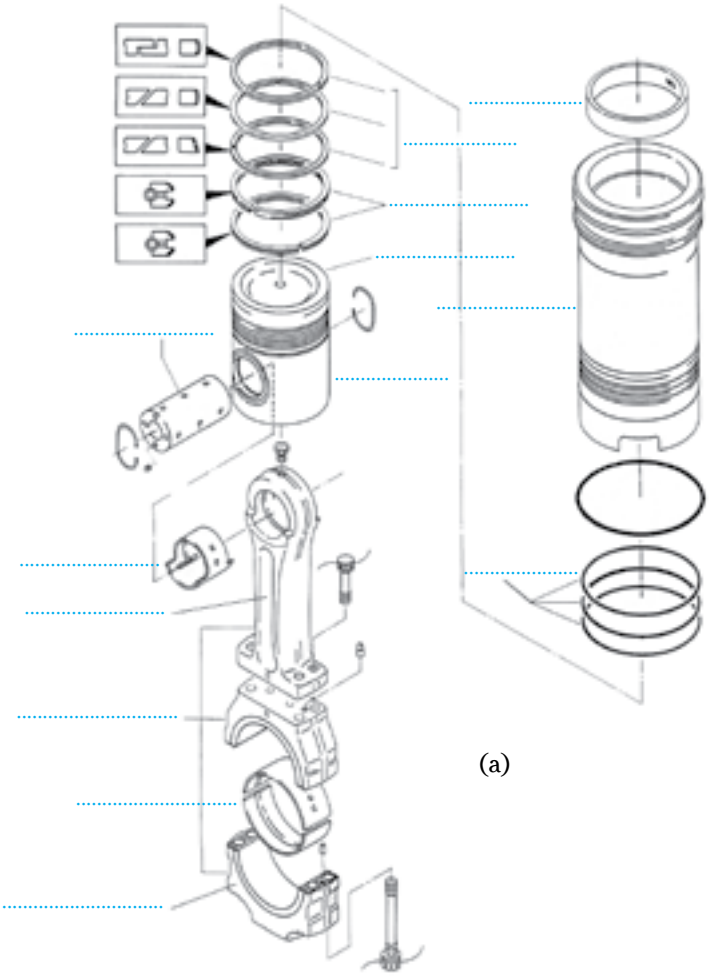
(a)



Student B: Look at the components in the box on page 496 and suggest which one is shown in the picture.

C. Insert the following terms in the correct picture.

piston skirt or trunk, pin, crown	**rings** compression, oil scraping, sealing, additional	**connecting rod** head bearing, top-end semi-shell, bottom-end semi-shell, top and bottom end bearings
cylinder liner	**cylinder head**	**valve** stem or spindle, head or mushroom, seat



(a)

(b)

(c)

D. Underline the correct choice.

1. In a 4-stroke Diesel Engine the piston is connected to the connecting rod with the.....
   a. crank pin
   b. gudgeon pin
   c. connection pin
2. In a 2-stroke Diesel Engine the piston rod is connected to the connecting rod with the....
   .....
   a. connection pin
   b. crosshead pin
   c. crank pin
3. The connecting rod is connected to the crankshaft with the.....
   a. crank pin
   b. connection pin
   c. crosshead pin
4. The piston ..... in the cylinder.
   a. reciprocates
   b. rotates
5. Diesel Engines are.....
   a. ICE (Internal Combustion Engines)
   b. ECE (External Combustion Engines)

6. The piston rod reciprocates into and out of the……
   a. stuffing box
   b. scavenge box

7. The …… opens the valves with the help of the ……
   a. crankshaft
   b. camshaft
   a. piston rod
   b. push rod

8. The 2-stroke DE does not have an …… valve; it has scavenge …….
   a. inlet
   b. exhaust
   a. valves
   b. ports

9. The crankshaft changes the …… motion into …… with the help of the …….. rod.
   a. reciprocating
   b. rotating
   a. reciprocating
   b. rotating
   a. connecting
   b. piston

10. The cylinder block, the frame of the engine and the bedplate are all three connected together with the……
    a. frame rods
    b. tie rods

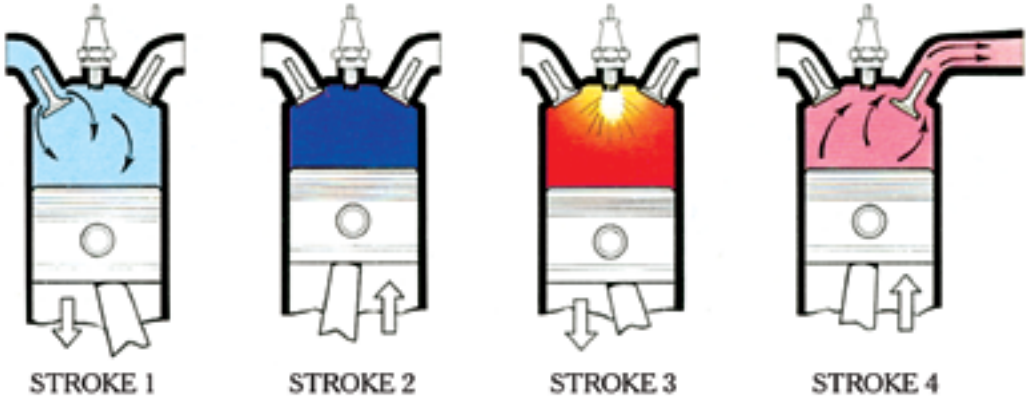
11. The valve seats are housed on the……
    a. cylinder liner
    b. cylinder head

12. The piston of a 2-stroke Diesel Engine does not have a……
    a. crown
    b. skirt

III. The 4-stroke and 2-stroke cycles

A. Listen to a description of a four-stroke cycle. Look at the words in the box below and circle the names of the strokes that you can hear. Then write them under the correct picture underneath.

compression	condensation	injection	intake
power	fire	exhaust	outlet



B. What do the following terms mean? Match.

1. stroke	☐ to fill up (with air)
2. T.D.C	☐ hole on the cylinder liner
3. B.D.C	☐ travel of the piston between the T.D.C and B.D.C
4. port	☐ to force liquid into (as by syringe)
5. to inject	☐ bottom dead centre
6. to charge	☐ top dead centre

C. What do the following terms mean? Match.

1. suction	☐ drawing in
2. ignition	☐ squeezing
3. combustion	☐ firing
4. exhaust	☐ burning
5. compression	☐ escape

The 4-stroke Diesel Engine

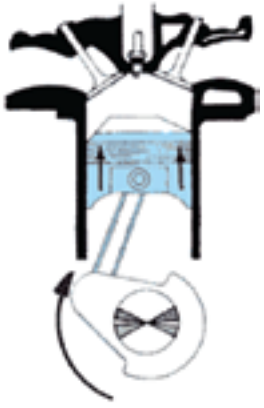
In a 4-stroke Diesel Engine the cycle is completed in four strokes of the piston or two revolutions of the crankshaft.

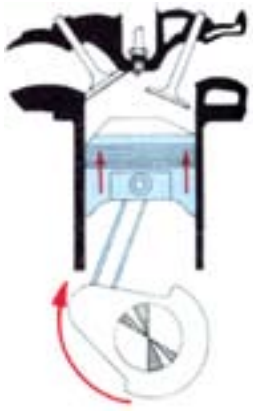
D. Use the terms in the box to complete the passage below which describes the four strokes of a 4-stroke Diesel Engine.

inlet	BDC	upwards	compresses	exhaust
compression	suction	rise	combustion	ignited
downwards	upwards	injection	TDC	power

During the (1)_____ **(or intake or induction) stroke** the intake valve is open and the piston is moving (2)_____. Air is drawn into the cylinder and when the piston reaches the (3)_____ the cylinder is full of air and the (4)_____ valve closes.

In the (5)_____ **stroke** the piston is moving (6)_____ and (7)_____ the air. The pressure and the temperature (8)_____. All valves are closed when the piston is almost at the (9)_____ the fuel is sprayed into the cylinder by the fuel (10)_____ valve. It is self (11)_____ because of the high temperature of the compressed air (over 500°C).



Then fuel is burnt and the (12)_____ gases push the piston down. This is the **combustion or** (13)_____ **stroke** – only this stroke provides power for the propulsion of the ship.	
Finally, in the (14)_____ **stroke** the piston is moving (15)_____ and the exhaust valve is opened, through which the exhaust gases are driven out.	

E. For more information about the 4-stroke Diesel Engine, underline the correct choice.

– Four-stroke Diesel Engines are **medium-speed / slow-speed** Diesel Engines, operating between **100 / 200** and **900 /1500** rpm.
– They are connected to the propeller **with / without** reduction gears. They are **small / big** in size and weight and they basically burn **heavy fuel oil / refined oil**.
– They are used in **medium-size / large** ships.

The 2-stroke Diesel Engine.

- In a 2-stroke Diesel Engine the cycle of operation is completed in two strokes of the piston or one revolution of the crankshaft.
- The 2 strokes are called compression and power (or expansion) stroke. However, the phases in the cycle do not differ from those in the 4-stroke Diesel Engine.
- The conventional 2-stroke Diesel Engine does not have inlet or exhaust valves. It has scavenge and exhaust ports instead, which are openings on the cylinder liner near the B.D.C. (the exhaust port being a little higher than the scavenge one).
- However modern very powerful 2-stroke Diesel Engines are built with an exhaust valve.

F. Read the passage on the operation of a 2-stroke Diesel engine.

i. Write the missing sentences in the correct space.

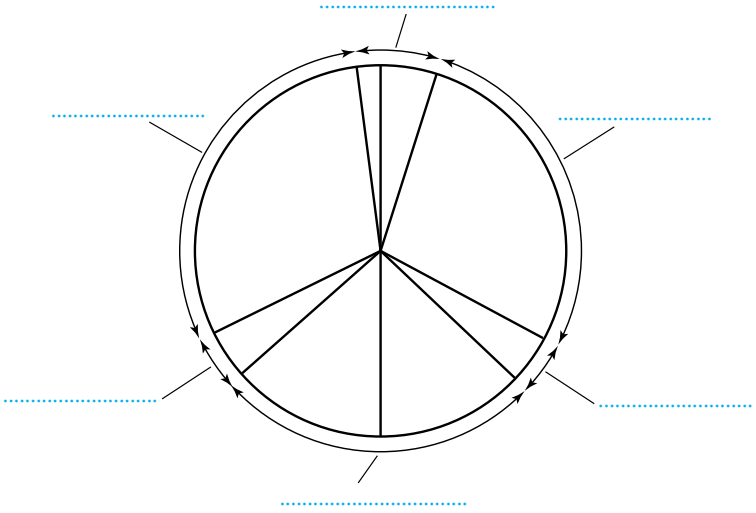
Pressure drops	Pressure and temperature rise

When the piston is at the BDC and before it starts its upward movement on its 1st stroke, the scavenge and exhaust ports (or exhaust valve) are already open. Pressurized air has already entered the cylinder expelling the remaining gases through the exhaust port (or valve). As the piston moves upwards on its first stroke it covers the scavenge ports first and then the exhaust port. Compression starts. ..... When the piston is a little before the TDC at the end of its 1st stroke the fuel is sprayed into the cylinder and is self–ignited.

At the beginning of its 2nd stroke the fuel has already been burned. The combustion gases push the piston down. As the piston moves downwards, it uncovers the exhaust port first and the hot gases escape through the exhaust manifold. ..... So, when the piston uncovers the scavenge port right after, air enters the cylinder under pressure to push the remaining gases out during the scavenge phase.

ii. Complete the time diagram below with all the phases of the cycle :

scavenge	post scavenge	expansion	exhaust	compression	ignition



G. Put the sentences (a–d) in the correct space to complete the description of the strokes.

Four-stroke engine	**Two-stroke engine**
1. Piston moves down. …….. 2. Piston moves up. Air is compressed. Fuel is injected and combustion takes place. 3. Piston moves down. 4. Piston moves up. ……	1. Piston moves down. …… 2. Piston moves up. Air is compressed by the piston. …… Fuel is injected and combustion takes place.

a) Air is taken in at the bottom of the cylinder.
b) Simultaneously, exhaust gases are forced out through valves at the top of the cylinder.
c) Air is taken in through the valves at the top of the cylinder.
d) Exhaust gases are forced out of the cylinder through valves at the top.

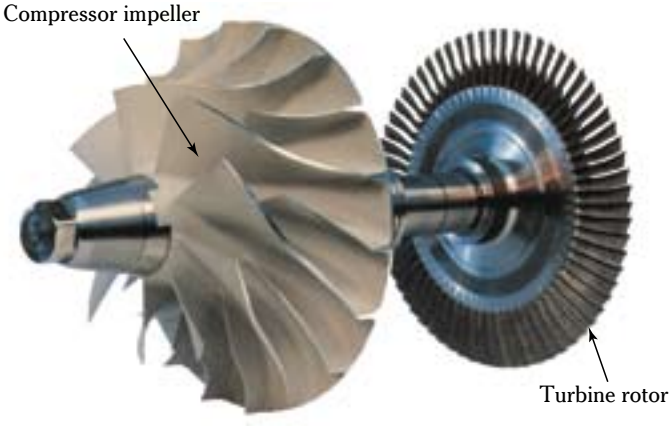
H. You will hear about the "Miller cycle" of operation in a Diesel Engine by Wärtsilä. Decide whether the following statements are True or False according to the clip.

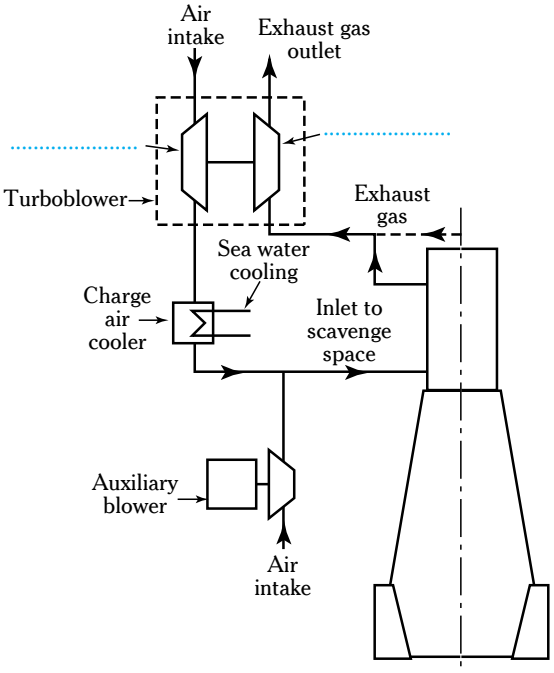
True	False	
☐	☐	1. In Wärtsilä engines the inlet valves close just before the piston reaches the bottom dead centre.
☐	☐	2. This method increases the work of compression and the combustion temperature.
☐	☐	3. The "Miller timing" method results in higher engine efficiency but also higher emissions.

IV. The turbocharger

A. Check what you know.

– How is the pressurized air, which is needed for the operation of a 2-stroke Diesel Engine, obtained?
– What are the two main components of a turbocharger? Identify them in the diagram below and then answer the questions underneath.





a) How is the turbine driven?

b) How is the compressor driven?

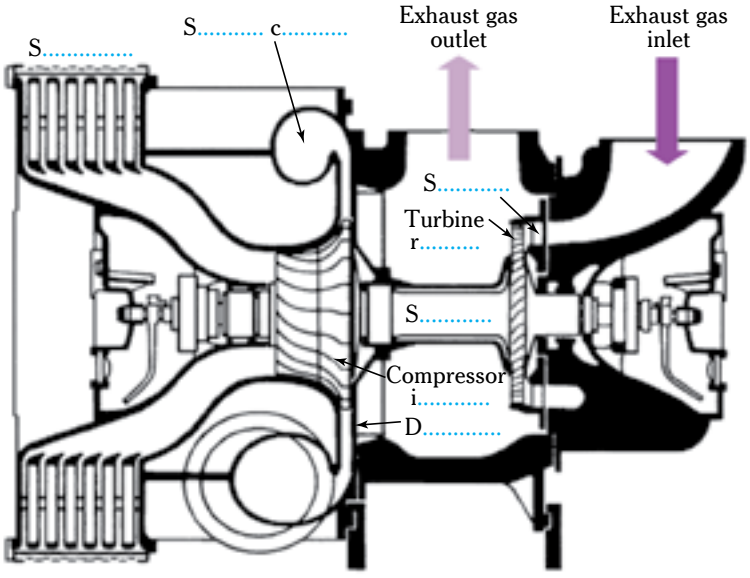
c) What does the compressed air pass through before it is charged into the cylinder?

B. Read the passage on the turbocharger and see if your answers to the previous questions were correct.

A turbocharger consists of a single turbine wheel, the rotor of which is mounted on the same shaft as with the impeller of a centrifugal compressor.

The turbocharger uses some of the energy of the hot exhaust gases of the engine to drive the turbine (35% of the total heat energy in the fuel is wasted to the exhaust gases). The turbine, being on the same shaft with the impeller of the compressor, transmits the power to the impeller and drives the compressor. The compressor compresses the incoming air which then is cooled and enters the scavenge air manifold. Besides the rotor, the turbine assembly has a stator too, that is, stationary vanes which direct the exhaust gases to the rotor. On the compressor's side on the other hand, there is a diffuser (where there may be more vanes) and a spiral casing, both of which contribute to further rising of the pressure of the compressed air. There is also a silencer to absorb the noise of the vibration of the running components.

C. The picture below is a cross section of a turbocharger of a diesel engine. With your study partner, try to identify the parts of the turbocharger underlined in the previous passage.



D. To summarize the differences between a 4-stroke and a 2-stroke Diesel Engine, tick appropriately in the following table.

	2-stroke Diesel Engine	4-stroke Diesel Engine
1. One cycle of operation needs one revolution of crankshaft		
2. One cycle of operation needs two revolutions of crankshaft		
3. Inlet valve exhaust valve		
4. Piston rod & crosshead		
5. Reduction gears		
6. Scavenge ports		
7. Low fuel consumption		
8. Slow speed		
9. Medium speed		
10. Heavier and more expensive		
11. Lighter and cheaper		
12. More powerful for the same size		

E. Write a paragraph comparing a 4-stroke Diesel Engine with a 2-stroke one. The previous exercise will help you. Add other differences you know, e.g. what kind of ships each engine is used on, the arrangement of cylinders, etc.

F. Project: Make a presentation.

- What features must a Diesel Engine (2-stroke or 4-stroke) have to make it most attractive in the Merchant Marine industry for main propulsion? Find such an engine and present it in class.

2. Boilers

Lead in: Discuss in class.

Can you identify the piece of machinery in the following two pictures?

– What does it do?
– Where is water kept?
– Where is steam kept?
– Where is the fuel burnt?
– Do you know any other parts?
– Do you know the types of boilers?

A. The following terms are related to boilers. Which of the definitions below describe the terms? Match.

economizer	superheater	steam drum	water drum
furnace	oil burners	steam	water tubes

1. The place where the fuel is burnt: .....
2. The vapour of water: .....
3. A great number of small tubes which super heat the wet steam: .....
4. They supply the fuel and air to the furnace: .....
5. Cylindrical chamber which holds water: .....
6. It preheats the feeding water: .....
7. Cylindrical chamber which holds mainly steam: .....
8. Water pipes which connect the steam drum with the water drums: .....

B. Read the following text on boilers and insert an appropriate term in the gaps from the list above (the terms in exercise A).

Boilers are used on board ships for producing (1)_____. This steam may be used for driving the main engines, when steam turbines are fitted, or for driving auxiliary machinery such as the windlass.

A steam generating plant consists of a furnace with the **oil burners**, **a boiler**, **a superheater**, **an economizer** and three separate **piping systems**: the **feed water system** which supplies the boiler with the required feed water, the **fuel oil system** which supplies the burners with fuel and the **steam system** which carries the steam from the boiler to the engine.

The (2)_____ is the space where the air and fuel oil mix and burn. The casing or shell is made of steel sheets and forms an airtight chamber. The walls and floor of the furnace have an insulation of fireproof bricks in two or three layers.

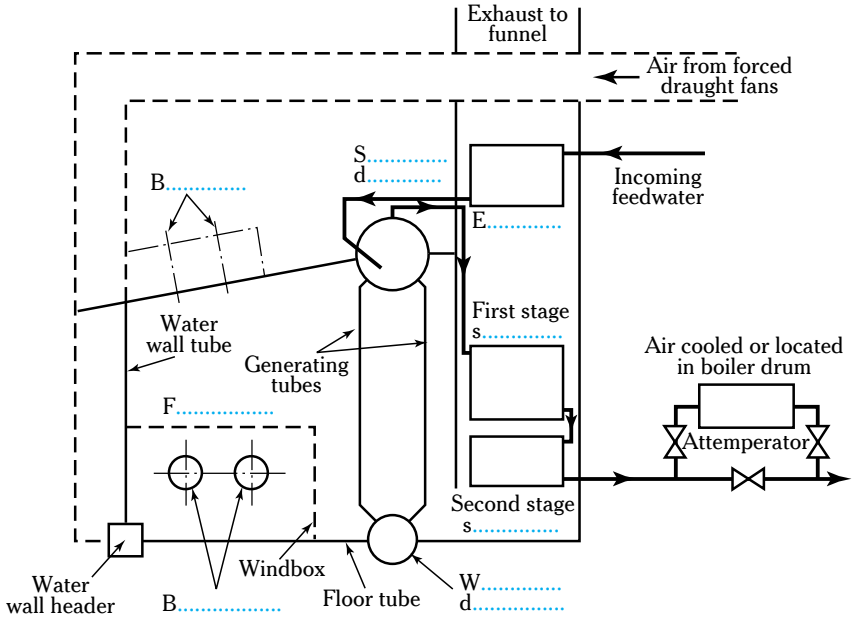
The (3)_____ in front of the fire-box supply the fuel oil and air to the furnace. Each burner has an atomizer and an air register.

The boiler holds the water and steam. It has three main parts, the **water drums**, the **steam drum** and the (4)_____ that connect them. It may also have a(n) (5)_____ which has a great number of small tubes and is used to super heat the wet steam before it enters the main steam pipe which leads to the

engines. The (6)_____ on the other hand serves to heat the feed water before it goes into the boiler.

When the boiler is in operation, the water circulates through the water tubes between the steam drum (at the top of the furnace) and the water drums (at the bottom of the furnace). The (7)_____ serves as a reservoir of water and the (8)_____ holds some of the boiling water but mainly serves as a storage space for steam.

C. Now look at the diagram of a simplified boiler arrangement and insert the missing terms.



D. Study the diagram again and answer the questions.

- How does the feed water circulate in the boiler?
- How is the steam generated? How does it circulate?

E. In pairs, use the boiler arrangement diagram, read the following passage on the operation of a boiler and fill in the missing terms.

The incoming feed water passes through a(n) (1)_____ first before it enters the lower part of the (2)_____. From there it enters the circulating tubes which take it in the water (3)_____, where water is heated by the combustion (4)_____.

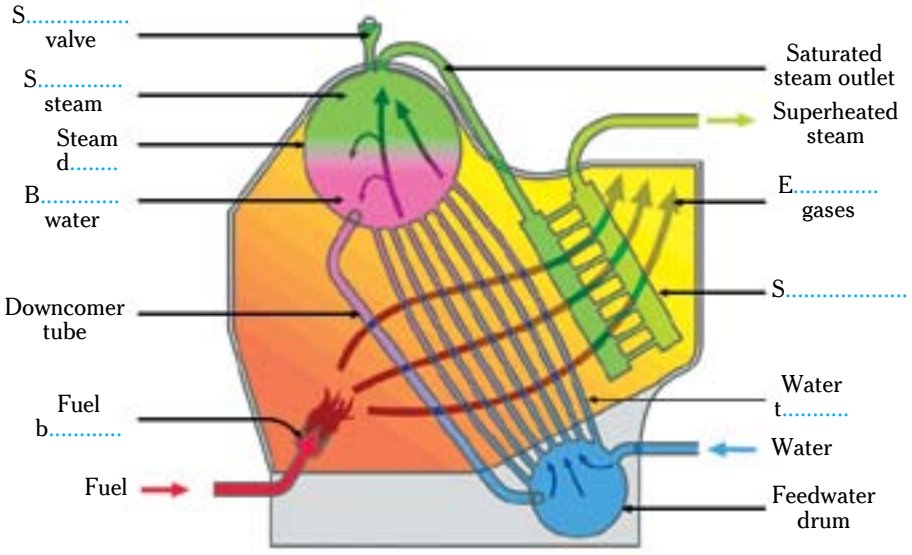
Then it enters the (5)_____ tubes where water changes into wet steam which enters the upper part of the steam drum and becomes saturated. From there the steam passes through the 1st and the 2nd stage (6)_____ where it becomes superheated and is led to the turbine.

Depending on the case there may be a(n) (7)_____ to decrease the temperature of the superheated steam. The side and the roof of the furnace form a(n) (8)_____ of tubes very near each other, which are supplied with water from a water wall (9)_____. The (10)_____ _____ may be placed either at the bottom of the boiler or at the top (preferably on modern boilers).

I. Types of boilers

The **water tube boiler** is one type of boiler in use. It is very efficient and because of this it is used for generating steam for main engines.

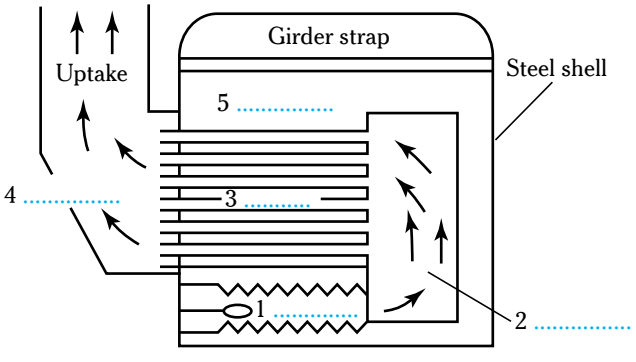
A. Fill in the missing terms in the schematic diagram of a marine type water tube boiler below. Then describe its operation.



Another type of boiler is the **fire tube** or **Scotch boiler**. The Scotch boiler is very strong but less efficient than the water tube. That is why it is used only for auxiliary purposes. In a fire tube boiler the water for generating steam does not circulate in the tubes but all around them, around the furnace and around the combustion chamber as well.

B. Here is a diagram of a Scotch boiler. Insert the following terms and describe its operation.

tubes	water	smoke box	furnace	combustion chamber

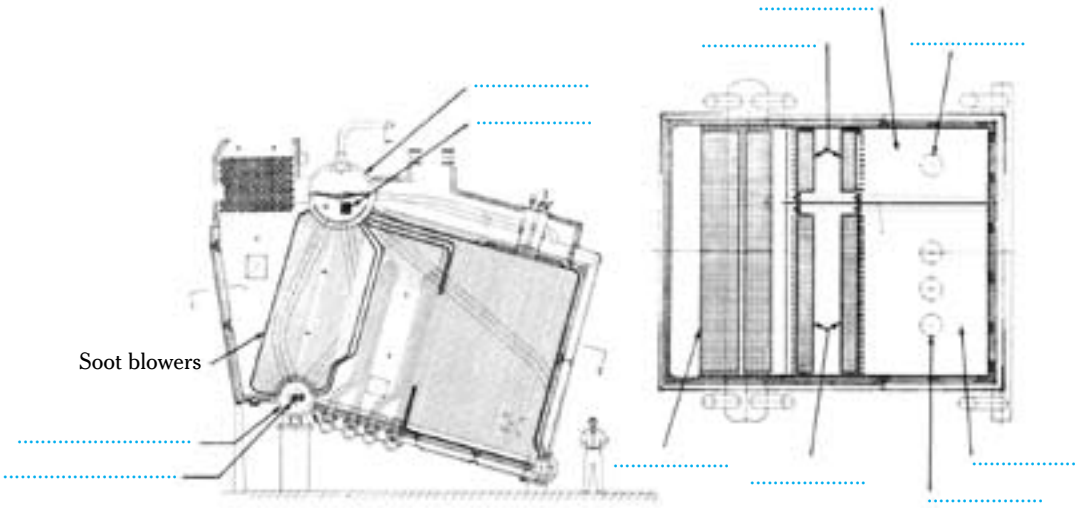


Scotch boiler

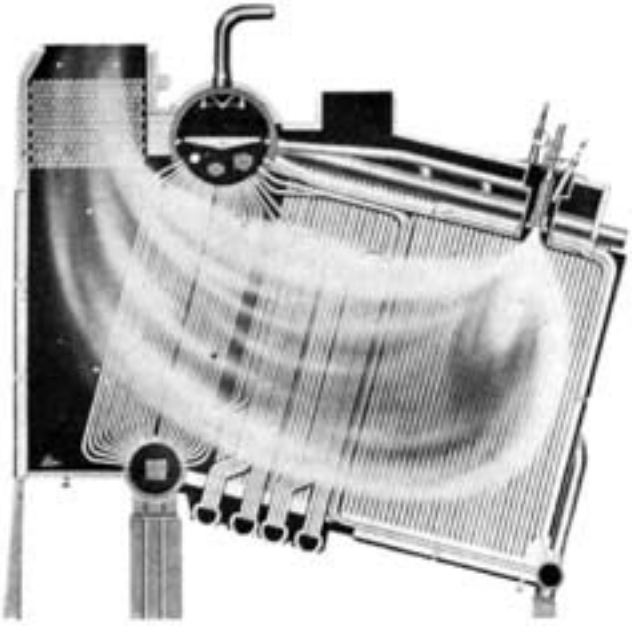
II. Boiler mountings

Various valves and gauges which are attached directly to the pressure parts of the boiler are known as boiler mountings. For a water tube boiler these include: **safety valves** which release any excess steam from the boiler, **feed check valves** which control the final entry of water into the boiler and a **main stop valve** which controls the passage of the steam to the engines. There are also **water level indicators** to show the level of water in the boiler, thermometers for showing the temperature inside the boiler, **drain valves** to drain water from the system, **salinometer valves**, in order to get samples of water for testing and **chemical dosing valves** for adding chemicals directly into the boiler.

A. Look at the vertical and horizontal cross section of a modern boiler below. Insert the terms in the first picture and present its operation using the second picture.



V2M-8R of the Combustion Engineering Co., with reheater



The boiler in operation

Note: the **soot blower** removes the soot that is deposited on the furnace tubes of a boiler during combustion [**soot**: the impure black carbon particles resulting from the incomplete combustion of a hydrocarbon].

B. Match the words to their definitions.

1. Fireproof	...Reservoir of water
2. Atomizer	...Apparatus which decreases the temperature
3. Water header	...Be in motion, move around
4. Attemperator / desuperheater	...Burning
5. Water wall	...Not affected by fire
6. Circulate	...Wall made of tubes of water
7. Combustion	...Filled with moisture
8. Saturated	...Part of the oil burner which sprays the fuel

C. Work in pairs to find the words which correspond to the following functions.

1. It shows the level of water in the boiler: .....
2. It can stop or start the flow of water into the boiler: .....
3. It measures the salinity of water: .....
4. It contains water and steam: .....
5. It allows the steam to pass to the engine: .....

D. Underline the best choice.

1. The steam which is generated in the tubes is **saturated / wet**, while the steam in the steam drum is **saturated / dry**.
2. Water changes into steam in the **circulating / generating** tubes.
3. Steam turbines need **superheated / saturated** steam.
4. The attemperator **increases / decreases** the temperature of the steam.
5. A desuperheater is the **same as / opposite of** a superheater.
6. The feed check valve controls the entry of the **steam / water** in the boiler.
7. The safety valve is actuated when there is **high / low** pressure.
8. The economizer is used to heat **the steam / the water** before it goes into the steam boiler.
9. The water wall header **supplies water to / is supplied with water from** the water wall tubes.
10. The Scotch boiler is **more / less** efficient than the water tube boiler.

E. Boiler safety systems[1]. Read the text and do the exercises that follow.

Marine boiler plants require adequate control systems to raise steam, maintain design conditions for steady steaming, secure the boiler units and (1) _____ *malfunctions* and failures. The automatic control arrangement on a shipboard boiler (2) _____ into two parts:

- **Safety system** which controls that all values are within the *predetermined* limits and give automatic alarm if some of them are not, and also *initiate* an automatic burner trip in case of a dangerous situation.

Continued

1. Lars Josefsson "Boiler safety systems".

- **Continuous control** of the different parameters for water level control, steam pressure control, fuel oil pressure control, fuel oil temperature control, blowdown control, superheat temperature control etc.

The combustion control system maintains *constant* steam pressure by (3)_____ of air and oil to the burner. The more advanced combustion controls transmit the air and oil loading simultaneously but with a slight *lag* between air and oil, so that with an increased boiler load, the air will lead the oil, and on a *decrease* in the boiler load the oil will lead the air. Such an arrangement makes it possible (4)_____ the *emission* of smoke during manoeuvring. All the classification societies have (5)_____ for marine *applications* due to the environment and the fact that one can't escape from an accident nor get service when the ship is (6)_____. Things just have to work.

i. Fill in the gaps in the text with the following phrases.

a) to minimize
b) sailing at sea
c) controlling the flow
d) detect promptly
e) is divided
f) special requirements

ii. Find the following words in the text (they are in italics) and try to guess what they mean. Then match them to the definitions below.

malfunction	initiate	application	decrease
predetermined	constant	lag	emission

1. A period of time between two events, a delay: _____.
2. When a piece of machinery fails to function normally: _____.
3. When heat, light gas or radiation is sent forth, given out or discharged: _____.
4. The practical use or relevance of something: _____.
5. Remaining the same and occurring continuously: _____
6. To cause to start: _____
7. Becoming smaller in amount: _____.
8. Decided in advance: _____

3. Steam Engines

Lead in: Check what you know.

A. Circle the correct alternative.

1. Steam engines are...
   a) internal combustion engines.
   b) external combustion engines.
2. In steam engines...
   a) heat energy and mechanical energy are produced in the same apparatus.
   b) heat energy and mechanical energy are produced in different parts.

3. In steam engines...
   a) the steam transmits the heat energy to the engine.
   b) the burning fuel transmits the heat energy to the engine.
4. The parts of a steam reciprocating engine...
   a) are similar to those of a two-stroke Diesel Engine.
   b) are completely different from those of a two-stroke Diesel Engine.
5. Steam turbines are...
   a) more efficient than reciprocating steam engines.
   b) less efficient than reciprocating steam engines.

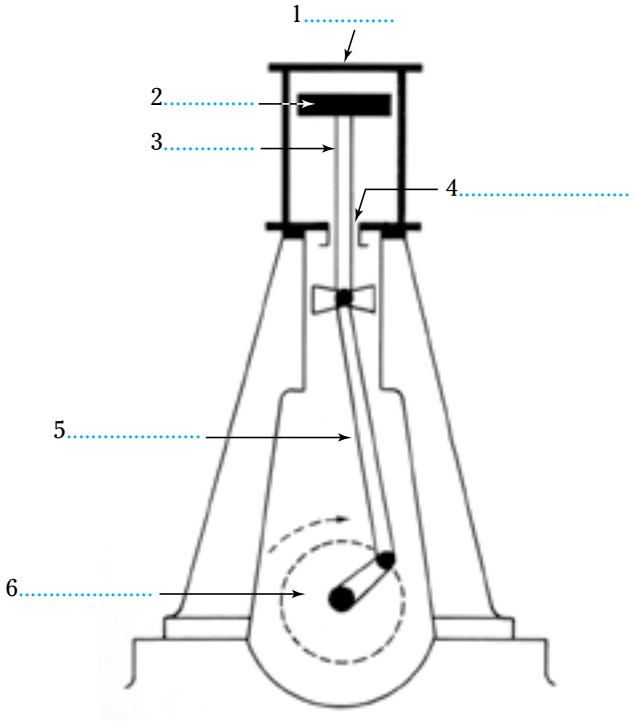
B. Write the correct word in the gaps.

Steam engines are (1)_____ combustion engines because the burning of the fuel takes place outside the engine. There are two types of steam engines, the (2)_____ steam engine and the steam (3)_____.

I. Reciprocating steam engines

A. In pairs, insert the following terms in the diagram of a single cylinder reciprocating steam engine.

Stuffing box	Cylinder	Piston
Piston rod	Connecting rod	Crankshaft



Single cylinder reciprocating steam engine

B. Read the passage on steam engines and insert the missing terms.

A **simple reciprocating steam engine** consists of a (1)_____ closed at both ends and a (2)_____ which moves back and forth in the cylinder by the force of steam. The piston is connected to a (3)_____ *[compound word]* that slides back and forth through a (4)_____ *[compound word]*. In each end of the cylinder there is a (5)_____ *[compound word]* to drain the water from the condensing steam.

Whatever the steam power plant is, beside the steam engine there must also be incorporated a boiler for the generation of steam. The steam generated in the boiler passes into the steam engine which converts the heat energy into mechanical work. After that the exhaust steam is condensed in a **condenser**, passes through a **deaerating feed tank** and is discharged by a **service pump** into a **preheater**. From there it passes into the boiler through the economizer and the cycle begins again.

C. In pairs, study the diagram of a steam power plant of a triple cylinder reciprocating steam engine and find the missing terms. The passage above and the list of terms in the box below will help you. Write the terms in the space provided; some are given for help.

Boiler	Condenser	Condensate pump	Steam pipe
Exhaust pipe	Deaerating Feed Tank - DFT	Preheater	Service pump

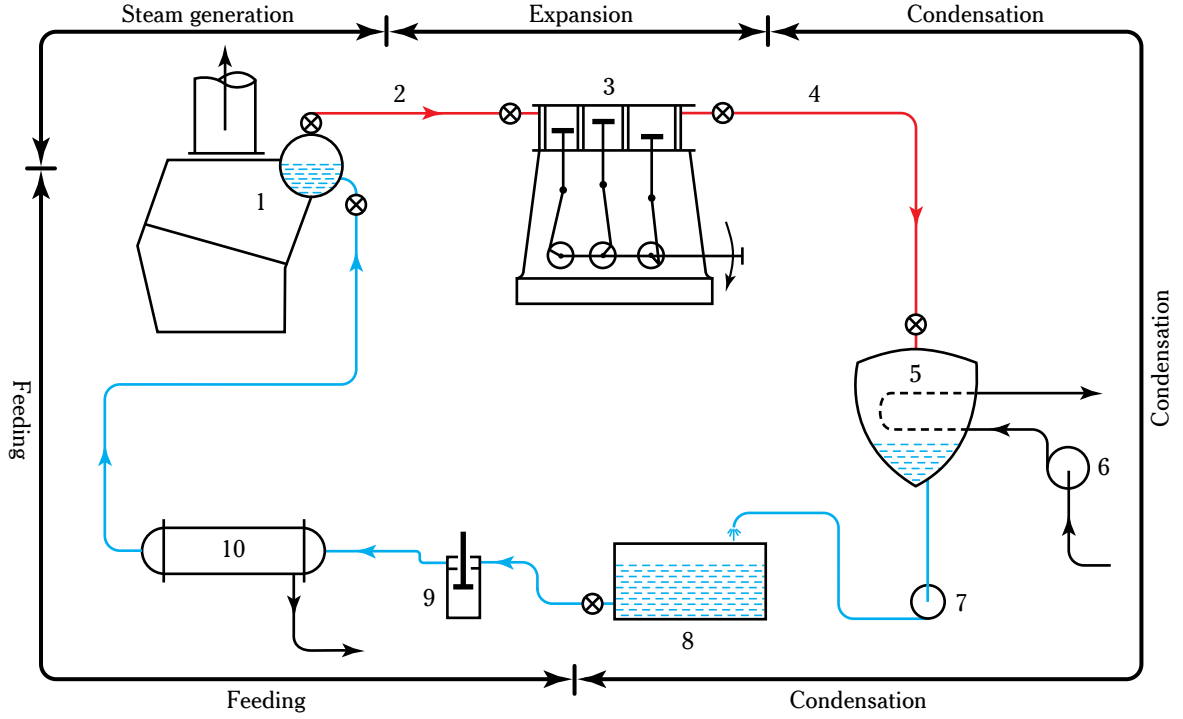


Diagram of steam power plant with triple cylinder reciprocating engine

1. .....
2. .....
3. reciprocating engine

4. .....
5. .....
6. sea-water pump
7. .....
8. .....
9. .....
10. .....

II. Steam turbines

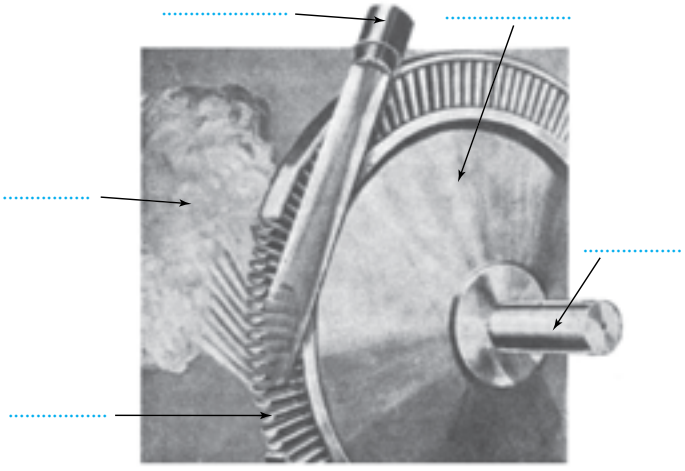
The **steam turbine** consists of a *rotor* mounted on a *shaft* that is free to rotate. The outer rim of the rotor has a set of curved *blades* and the whole system is enclosed in an airtight case. Several *nozzles* direct the *steam* against the blades and turn the rotor.

We have three types of steam turbines:

– the **impulse turbine**,
– the **reaction turbine** and
– the **action-reaction turbine**.

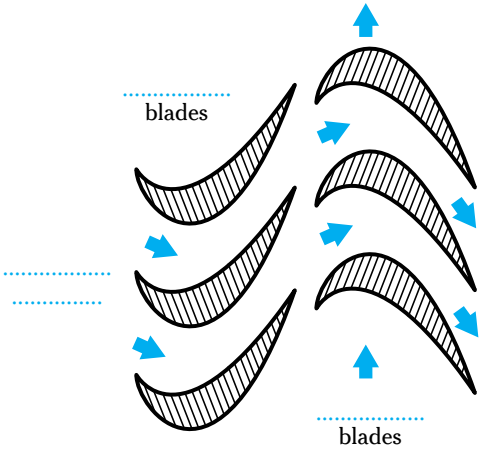
A. Identify the parts of a simple impulse turbine in the graph.

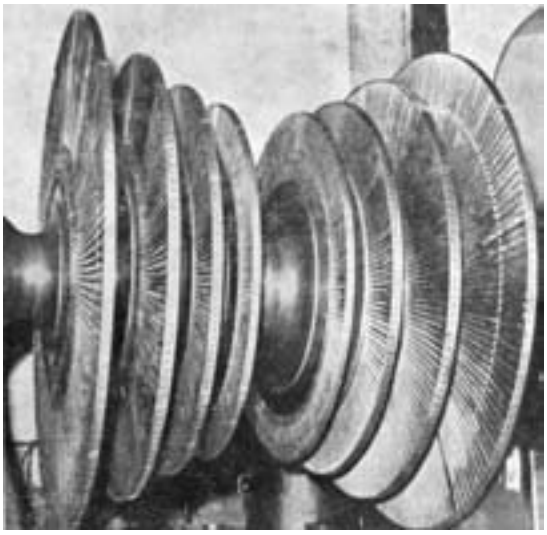
In the impulse turbine the steam from the nozzles is directed against the blades and turns the rotor.



B. Look at the following view of blades and insert their missing type.

In the reaction turbine the steam passes first through the stationary blades where it expands and with increased speed enters the rotating blades and turns the rotor (action). While being in the canals of the rotating blades, the steam expands again and turns the rotor with a force exerted on the blades in the opposite direction this time (reaction).





Double flow reaction steam turbine rotor

C. Read the following text and do exercises (i) and (ii) below.

*The **reaction-type turbine** has all the advantages of the impulse-type, plus a slower operating speed and greater efficiency.*

*The steam is fed from a high-pressure (H.P.) line into the high-pressure turbine through a throttle valve. After passing through this H.P. turbine where some of its energy is converted to useful work, the steam is fed to the low-pressure (L.P.) turbine. The larger diameter of the L.P. turbine is due to the increased volume of steam as it expands because of the decrease in pressure. The L.P. turbine usually consists of a combination of impulse and reaction elements. All of the stages of the L.P. turbine operate on the reaction principle. This rotor also carries the blading of the **astern element** which is used for backing down.*

*The **turbine bearings** require special attention. They support the weight of the rotor and are adjusted to maintain a close clearance between the stationary and rotating blades.*

i. Look at the diagram of a steam power plant of a reaction turbine. Can you identify the H.P. turbine and the L.P. turbine in the diagram?

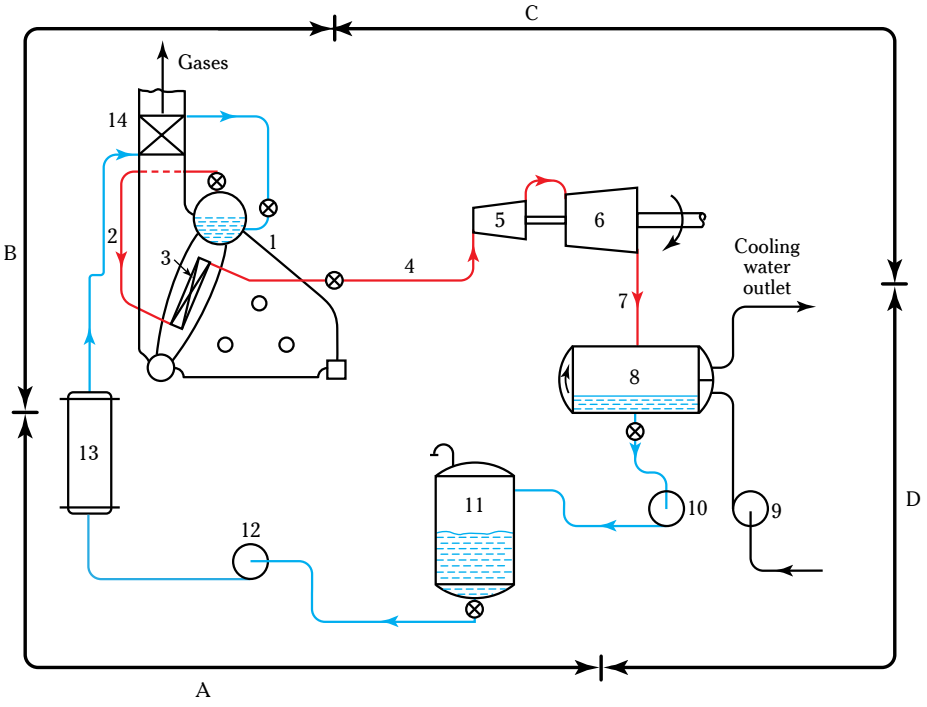


Diagram of steam power plant of reaction turbine

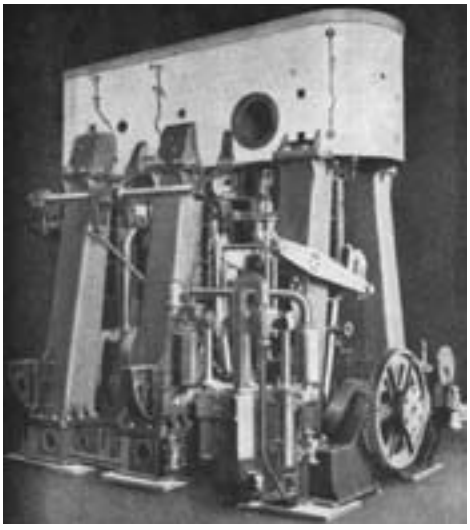
ii. Write what is shown in the diagram:

1. ……	8. ……	A. ……
2. ……	9. ……	B. ……
3. ……	10. ……..…	C. ……
4. ……	11. ……..	D. ……
5. ……	12. ……..	
6. ……	13. ……..	
7. ……	14. ……..	

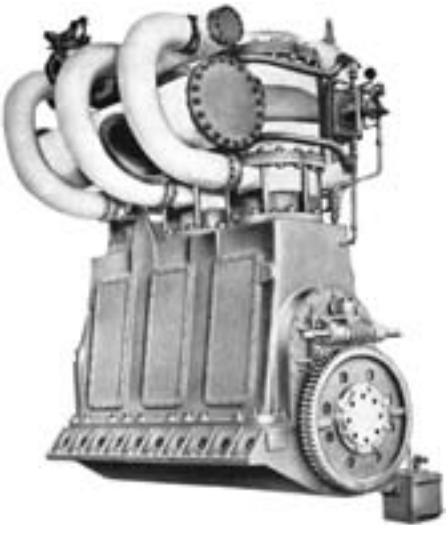
• If you need extra help, all the words you need are in the box below.

Economizer	Condensation	Feed pump	H.P. steam turbine
Preheater	Condensate pump	Condenser	Superheated steam pipe
DFT	L.P. steam turbine	Boiler	Saturated steam pipe
Steam generation	Expansion	Superheater	Sea water cooling circulating pump
Exhaust pipe	Feeding		

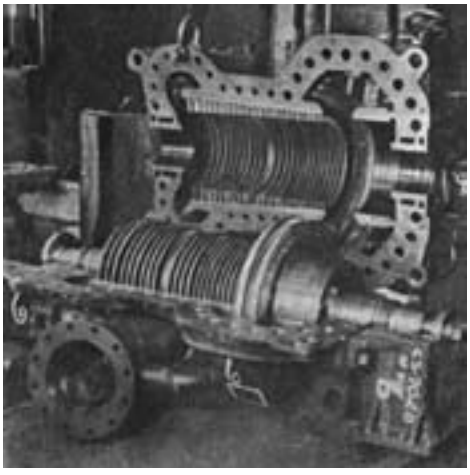
D. The following are pictures of steam engines. Can you distinguish between reciprocating steam engines and steam turbines (impulse, reaction, action-reaction)?



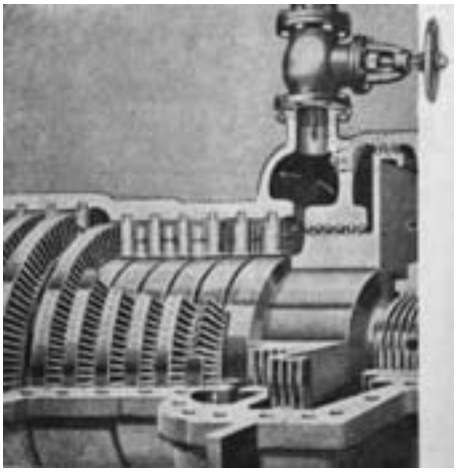
(a).....



(b).....

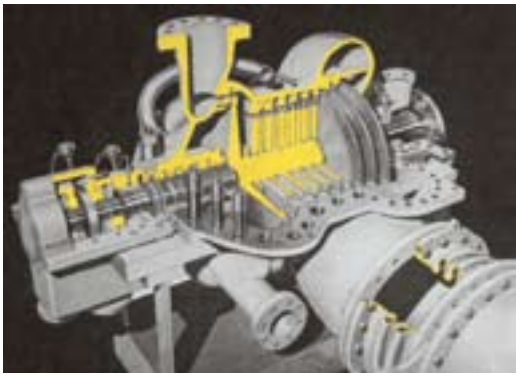


(c).....



(d).....

(e).....



E. Match the following terms to their definitions.

1. condenser	... the opposite of ahead
2. deaerating tank	... rotating drum
3. efficient	... action
4. rotor	... fixed, not in motion
5. blade	... apparatus which changes the steam into water by cooling it
6. impulse	... to change into something else
7. stationary	... capable of better output
8. to expand	... one of the flat thin (metal) parts (that turn around in a turbine)
9. astern	... to grow larger, spread out
10. to convert	... vessel where water gets rid of air and other gases

F. Match the words to make compound ones.

proof	valve	turbine	drum	cock (or valve)
chamber	drum	tube	heater	tight

1. Steam _____
2. Fire _____
3. Fire _____
4. Super_____
5. Combustion _____
6. Steam _____
7. Air_____
8. Water _____
9. Safety _____
10. Drain_____

G. We can also have three–word compound nouns such as "external combustion engine". Match the words to make 3-word compound nouns and write them in the space provided below. The first one is done as an example.

1. deaerating	proof	~~engine~~
2. low	check	bearing
3. fire	pressure	pump
4. sea	level	casing
~~5. reciprocating~~	feeding	turbine
6. water	end	header
7. feed	tube	valve
8. water	water	indicator
9. water	~~steam~~	tank
10. bottom	wall	boiler

1. reciprocating steam engine
2. bottom..... bearing
3. sea..... pump
4. fire..... casing
5. low..... turbine
6. water..... header
7. feed..... valve
8. water..... indicator
9. deaerating..... tank
10. water..... boiler

H. Underline the correct choice.

1. The steam which is collected in the steam drum of the boiler is _____.
   a) dry
   b) superheated
   c) saturated
2. Steam transmits _____ to the engine.
   a) kinetic energy
   b) heat energy
   c) mechanical energy
3. When the temperature of the steam falls below permissible limits, _____ takes place.
   a) evaporation
   b) condensation
   c) concentration
4. The main part of a reciprocating steam engine is _____.
   a) the piston
   b) the rotor
   c) the blades
5. In an impulse turbine the steam is directed from the _____ against the _____.

a) blades	a) blades
b) nozzles	b) nozzles
c) rotor	c) rotor

6. In an impulse turbine the blades are _____.
   a) stationary
   b) rotating
   c) stationary and rotating
7. In a reaction turbine the steam from the boiler comes into _____ first.
   a) a L.P. turbine
   b) a H.P. turbine
   c) a high pressure line
8. The L.P. turbine is larger due to the _____ of the steam because of the _____ in pressure.

a) extension	a) decrease
b) exhaust	b) increase
c) expansion	c) raise

9. The reaction turbine is _____ than the impulse turbine.
   a) more efficient
   b) faster
   c) less advantageous

I. Reorder the letters to form the word which corresponds to the definition.

1. Move back and forth: [t, p, i, e, r, c, a, e, r, o, c] _____
2. A cooler where the steam changes into water again: [n, s, c, e, n, r, o, d, e] _____
3. The steam comes out of these at a high pressure: [z, l, n, z, o, e, s] _____
4. A kind of turbine: [p, l, u, s, e, m, i] _____
5. The support of the rotor of the turbine: [a, n, i, e, r, g, b, s] _____

J. Fill in the gaps with the correct word from the box.

mounted	deaerating	volume	throttle	boiling
astern	liquid	stationary	gas	packing gland
	blades	rotating	solid	

1. We can produce steam by heating water to its _____ point.
2. The water can exist in three stages: as _____ it is water, as _____ it is ice, and as _____ it is steam.
3. On the rim of the rotor there are curved _____.
4. The rotor is _____ on a shaft.
5. In the reaction turbine the blades can be both _____ and _____.
6. The piston rod slides into the _____.
7. In the _____ feed tank the condensate gets rid of air.
8. The high pressure steam passes from the H.P. line into the H.P. turbine through a _____ valve.
9. The rotor of the L.P. turbine has additionally the _____ blades for backing down.
10. When the pressure of the steam is decreased its _____ is increased, because the steam expands.

K. Choose the correct term for each definition.

1. A device by means of which a liquid is reduced to very fine spray.
   a) Atomizer
   b) Economizer

2. A vessel in which boiler feed water is heated under reduced pressure in order to remove dissolved air.
   a) Combustion chamber
   b) Deaerator

3. A device for removing all or part of the superheat from steam by spraying water into it or by use of a heat exchanger.
   a) Desuperheater
   b) Superheater

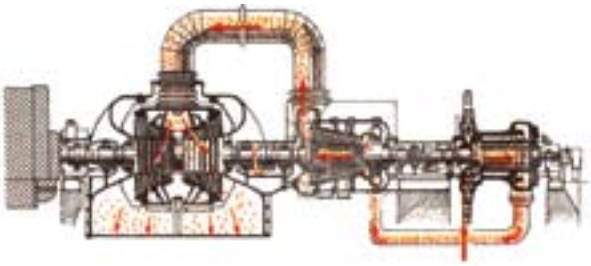
4. A device which cools exhaust steam back into water.
   a) Condenser
   b) Deaerator
5. A heat exchanger that transfers heat from the gases of combustion to the Boiler Feedwater.
   a) Economizer
   b) Resuperheater
6. A type of boiler design in which combustion gases flow inside the tubes and water flows outside the tubes.
   a) Fire-tube boiler
   b) Water tube boiler
7. An enclosed space provided for the combustion of fuel.
   a) Furnace
   b) Funnel
8. The upper drum of a water tube boiler where the separation of water and steam occurs.
   a) Header
   b) Steam drum

L. Complete the missing word.

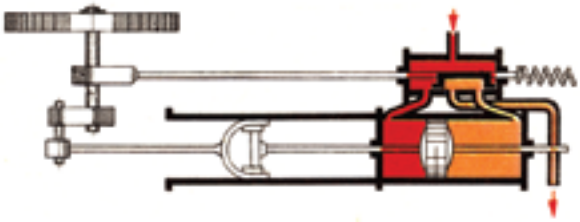
1. S _ _ _ _ h M _ _ _ _ e boiler: fire-tube boiler equipped with an internal furnace, fire chamber and return tubes completely surrounded by water.
2. W _ _ _ r T _ _ e boiler: a boiler having a heating surface consisting of a large number of relatively small diameter tubes which contain water. The heat is applied on the external side of the tubes.
3. R _ _ _ _ _ _ _ _ _ _ _ g engine: any engine which employs a piston working in a cylinder, the piston being caused to oscillate by the periodic pressure of the working fluid.
4. S _ _ _ _ _ _ _ d water: water at its boiling point.
5. S _ _ _ _ _ _ _ _ _ r: a bank of tubes in the exhaust gas duct after the boiler, used to heat the steam above the saturation temperature.
6. S _ _ _ _ y valve: a spring loaded valve that automatically opens to prevent excessive pressure from building up in a boiler.

M. Project: Make a presentation. Choose one of the following.

- Draw a diagram of a steam power plant and explain how it works.
- Pick one of the two engines shown below and describe its parts and operation.



External combustion steam turbine engine



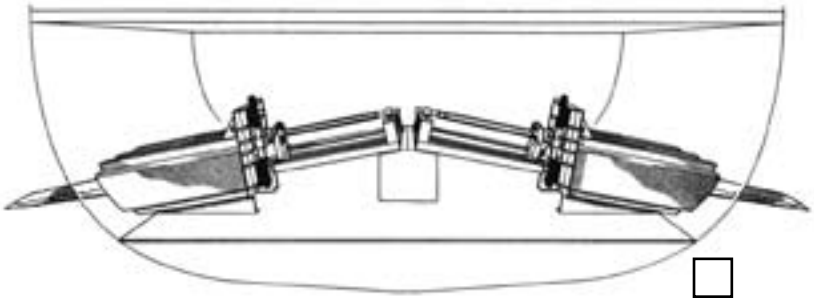
External combustion reciprocating steam engine

4. Auxiliary Machinery

Besides the main engines which are used for the propulsion of the ship there is also auxiliary machinery on board which covers everything mechanical on board, plus all the pipes and fittings and the equipment needed to carry out various functions.

A. Which of the auxiliary machinery can you identify in the pictures below? Label them with an appropriate term from the list in the box.

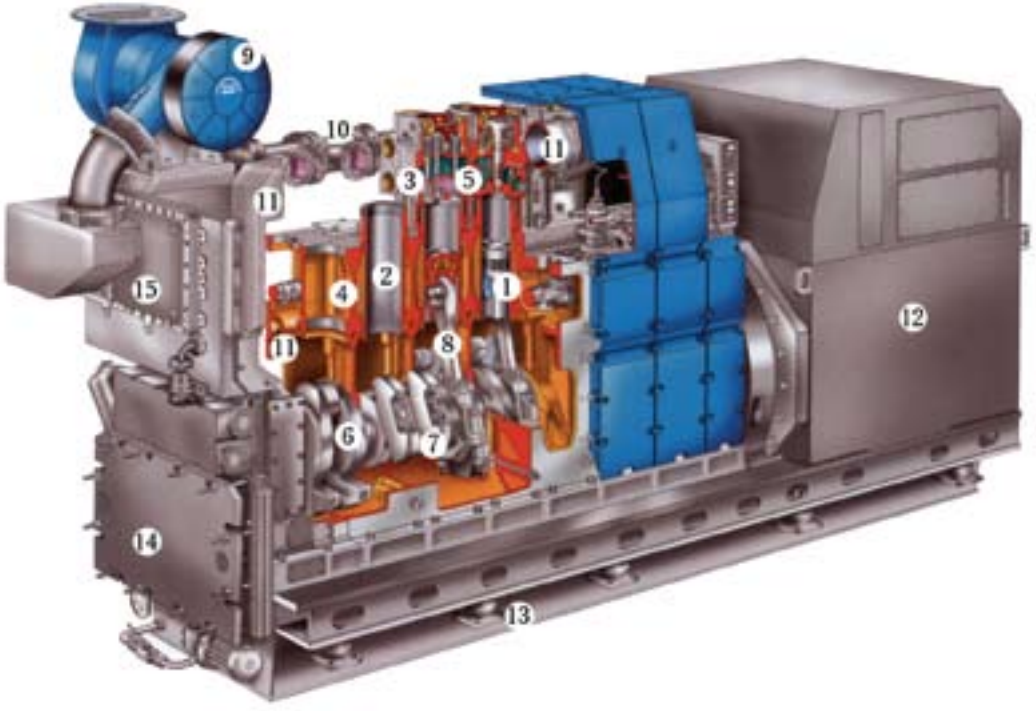
Generator [1]	Windlass [3]	Fire extinguisher [5]	Capstan [7]
Crane [2]	Pumps [4]	Fin stabilizers [6]	Electric motor [8]



B. Which of the auxiliaries in exercise A is used for...

1. Handling the anchor: _____
2. Handling the cargo: _____
3. Handling the ropes for mooring the ship: _____
4. Supplying the ship with electrical power and lighting: _____
5. Fire-fighting: _____
6. Transferring liquids from one place to another: _____
7. Reducing rolling of the ship: _____
8. Driving another machine: _____

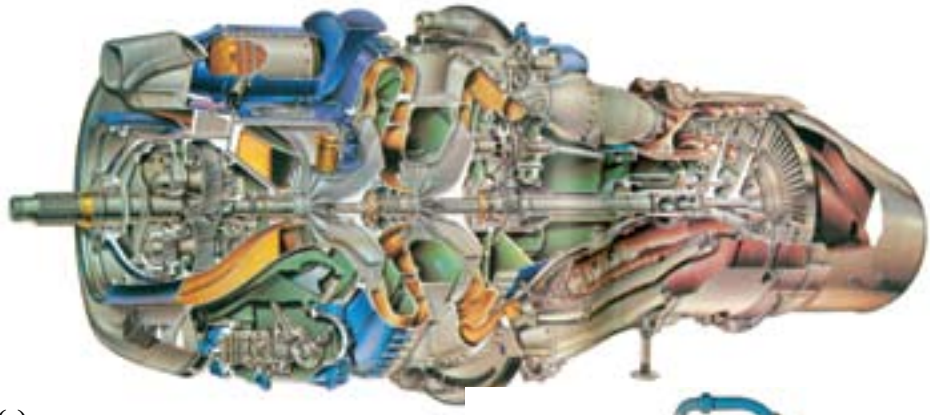
C. Show the different components in the diesel generator below. Write them in the space provided. The first letter is given for help.



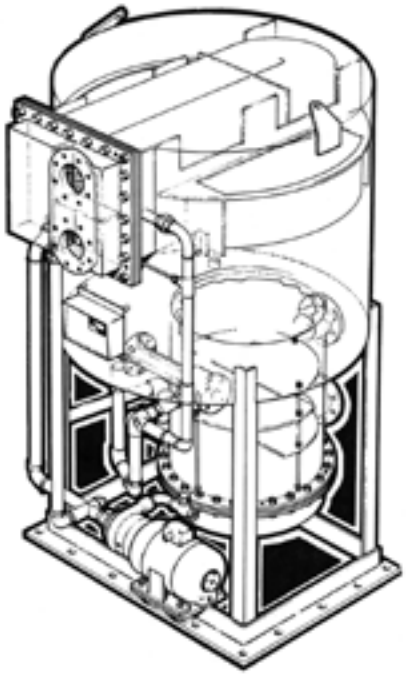
1. p……..
2. c……..
3. c…….. h……..
4. entablature with cooling space
5. i……./ o…… v……..
6. c…….
7. balancing weight
8. c…….. r……
9. t…… c……
10. exhaust ducting
11. s…….. air duct
12. g……
13. flexible m……..
14. w…….. c…..……
15. a…… c……..

There are various auxiliaries which supply the needs of the main engines and boilers such as **coolers**, **heaters**, **air compressors**, **oil-water separators (purifiers)** and **evaporators**.

D. Choose an appropriate term from the ones mentioned above to fill in the gaps in the sentences and label the corresponding machines in the pictures as well.



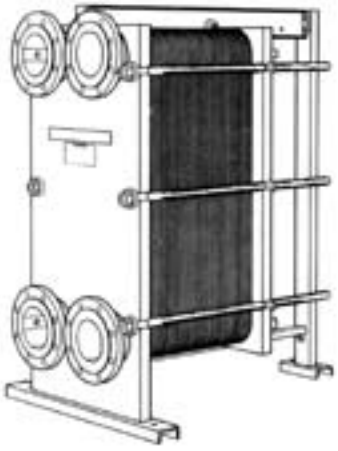
(a).....



(b).....

(c).....

(d).....



(e).....

1. We use a(n) _____ to supply compressed air for starting the engine. Picture ☐
2. _____ are used for cooling either oil or water. Picture ☐
3. We use a(n) _____ to heat the oil and improve the viscosity. Picture ☐
4. The oil gets rid of water and other harmful substances in a(n) _____ . Picture ☐
5. We can have distilled water from a(n) _____ . Picture ☐

E. Read about fresh water production on board and fill in the missing parts in the text.

Ships navigating deep sea, make their own fresh water.

Salt water, evaporated into steam and then brought into a condenser produces condensate, which is fresh water. When the pressure in the boiler is reduced below atmospheric pressure, the boiling temperature is lower than 100°C. This phenomenon allows the hot cooling water, after having done its work in cooling the main engine, to make fresh water. The cooling water is led through a heat exchanger inside the lower part of a drum, where the pressure is reduced using an ejector. The heat exchanger is submerged in clean seawater, which boils in the low-pressure atmosphere. (1) ..... Condensate drips from the tubes. Below this condenser a conical dish collects condensate. Through a drain line in the centre of the dish, the fresh water is transferred outside the drum. This system is called (2) ..... .

A second way of making fresh water is filtering. (3)..... The water passes and comes out as fresh water. This process is called (4)..... .

(a) Salt water is pumped under high pressure through a membrane with openings so small that salt molecules cannot pass.	(b) The vapour goes to the high part of the drum, where another heat exchanger with cold seawater acts as a condenser.	(c) reverse osmosis	(d) an evaporator

F. Complete the Glossary with the following words, found in the text above.

condensate	drip	transfer	evaporate	drain line	submerge

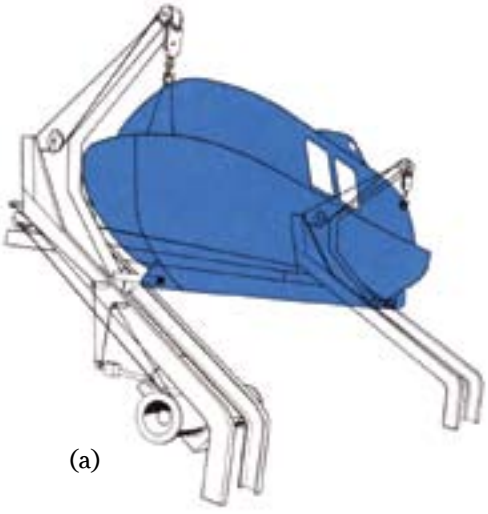
Glossary

.....	to turn from liquid into vapour
.....	the liquid collected by condensation (=the conversion of vapour or gas to liquid)
.....	to place under water
.....	to fall in drops
.....	pipes that carry away liquid waste
.....	to move from one place to another

Reverse osmosis plant

Other auxiliaries include **fans**, **ventilators** or **blowers** which supply air for the engines or cargo spaces. The **steering gear** is also necessary to operate the rudder for manoeuvring and the **launching gear (davits)** for lowering lifeboats to sea.

G. Can you identify the fan (or blower), the steering gear (ram steering gear), and the launching gear (gravity davits) in the following pictures?



(a)

(b)

(c)

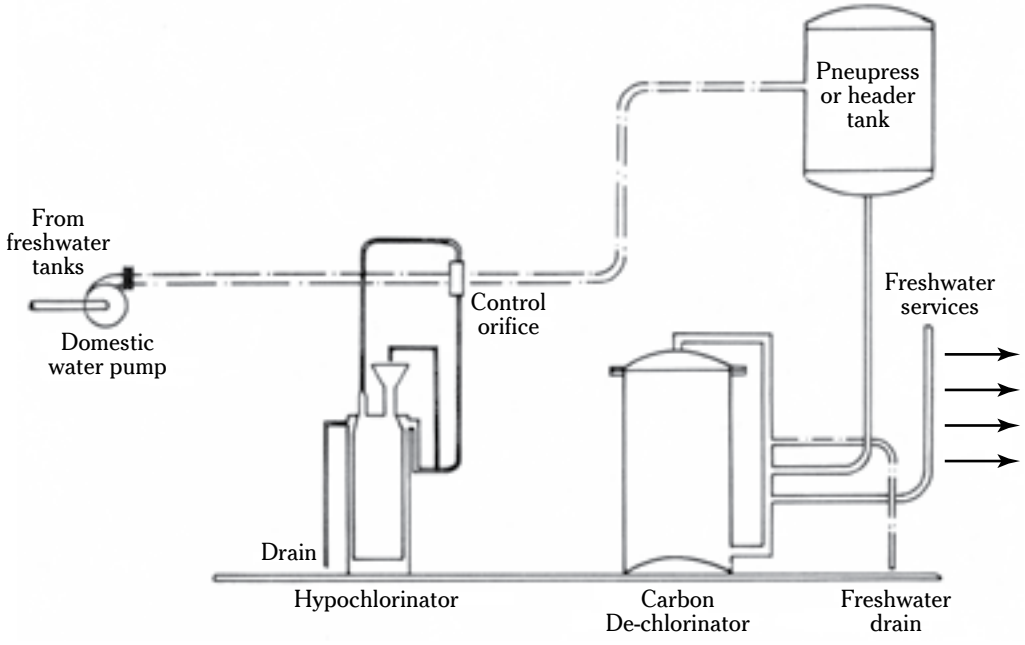
To supply domestic needs there is a **sewage treatment plant** where human body waste is treated biologically before being discharged into the sea and an **incinerator** where garbage is burnt. Fresh water is produced in a distillation plant but it can be used for drinking only after appropriate treatment to meet purity standards.

H. Which picture shows the incinerator and which one the sewage treatment plant?

(a).....

(b).....

I. What treatment is carried out in the diagram below?



J. Circle the correct choice.

1. In order to lower the boats to the sea we use the **steering gear** / **launching gear**.
2. **Fire extinguishers** / **fire detectors** warn us of a fire in a place.
3. Fuel oil is cleaned in **a separator** / **an evaporator**.
4. Steam changes into water in a **compressor** / **condenser**.

5. If lub oil has high viscosity, a **heater / cooler** can regulate it.
6. **Pumps / cranes** are used for loading and unloading liquid cargo.
7. The economizer of a boiler is a **cooler / heater** of the feeding water.
8. To remove water from the machinery space we use a **bilge pump / service pump**.
9. **Motors / generators** supply electricity on board.
10. Evaporators produce water which can be used for **drinking / boilers**.
11. We use the **windlass / capstan** for pulling in mooring lines.
12. **Electric fans / generators** provide forced ventilation to holds.
13. A lot of trash (waste) can be burnt in the **incinerator / evaporator**.
14. To manoeuvre the ship we use the **turning gear / steering gear**.
15. Fin-stabilizers improve the ship's **stability / instability**.

K. Ask and answer questions about the function of different auxiliaries.

e.g. A: What does an air compressor do?
B: It compresses the air which is needed to start the engine.

L. Project: Make a presentation.

- Choose one of the auxiliary machinery. Find more about its parts and operation and present it in class.

5. Pumps

Lead-in: Discuss in class.

– What does a pump do?
– What liquids can it transfer?
– How is a pump driven?

A. Here's a list of duties pumps carry out on board. Find the name of the pump for each duty. Look at the list that follows for help.

1. Supply water to the boiler: _____
2. Transfer the condensate from the condenser: _____
3. Supply the engine with fuel oil: _____
4. Supply the engine with lub oil: _____
5. Supply the engine with cooling water: _____
6. Evacuate the tanks and other compartments of water: _____
7. Transfer ballast from one tank to another: _____
8. Load and unload cargo: _____
9. Supply the firemain with water: _____
10. Supply sanitary spaces with water: _____
11. Supply fresh or (salt) water on board: _____
12. Serve general purposes: _____
13. Draw remains from a tank or apparatus: _____

Cooling water circulating pump	Ballast pump	Bilge pump	Fresh water pump
Air pump or condensate	Lub-oil pump	Drain pump	Feed water pump
General service pump	Fuel oil pump	Cargo pump	Sanitary pump
Emergency fire pump			

B. Read the following passage on pumps and insert an appropriate word in the gaps. Use the words in the box.

A pump is a (1)_____ which is used to (2) _____ liquids from one point to another under (3)_____.

There is a great variety of (4)_____ on board which are all moved by pumps; such as:
- (5)_____ and (6)_____ water,
- (7)_____ oil and (8)_____ oil,
- boiler (9)_____ water, etc.

Pumps can be driven by
- (10)_____ engines,
- (11)_____ engines,
- (12)_____ engines and to a great extent by
- electric (13)_____.

A pumping system on board consists of a (14)_____ branch, a pump and a discharge branch.

feed
transfer
device
suction
pressure
motors
diesel
steam
petrol
liquids
fresh
lub
sea
fuel

Types of pumps.
There are two main groups of pumps in maritime use: **displacement pumps** and **centrifugal pumps**.

- In the displacement pump the increase or decrease of the **volume** of the pump chamber causes the **suction** or **discharge** of the liquid (or gas).
- In the centrifugal pump there is an **impeller** rotating at high speed inside the pump casing. The liquid enters the pump through the suction pipe, is thrown against the surrounding casing by centrifugal force and finally is discharged through the delivery outlet.

I. Displacement pumps

The displacement pumps can be subdivided into:

i. **reciprocating pumps** in which a piston (or ram, or plunger) is mechanically reciprocated in a liquid cylinder and
ii. **rotary pumps** (or volumetric pumps) where the liquid is forced through the pump casing by means of **gears**, **screws**, **vanes** (or lobes, or pistons).

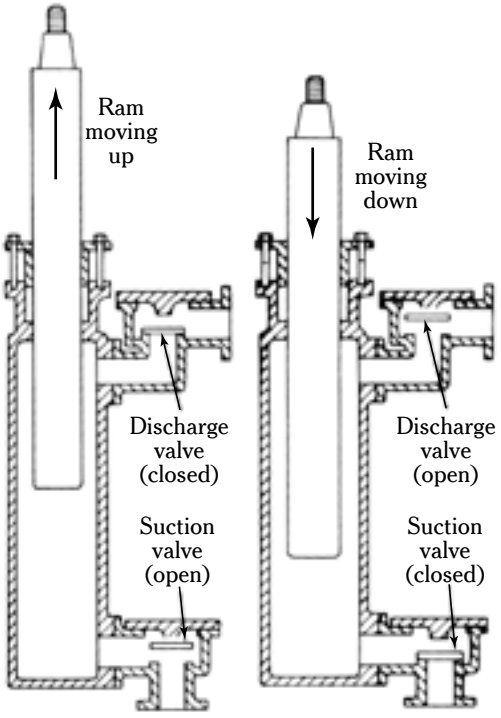
A. Find the words in the passages (and information) above which mean.

1. Removal off position from an object: .....
2. Throwing away from the centre: .....

3. Delivery: .....
4. Rotary unit: .....
5. Moving back and forth: .....
6. Turning round and round: .....
7. Toothed wheels: .....
8. Blades: .....
9. Capacity, cubic content: .....
10. Shell: .....

i. Reciprocating pumps

A simple kind of reciprocating pump is the single-acting ram pump. This is the diagram of such a pump:



B. Using the diagram above, read the paragraph underneath and insert the missing terms.

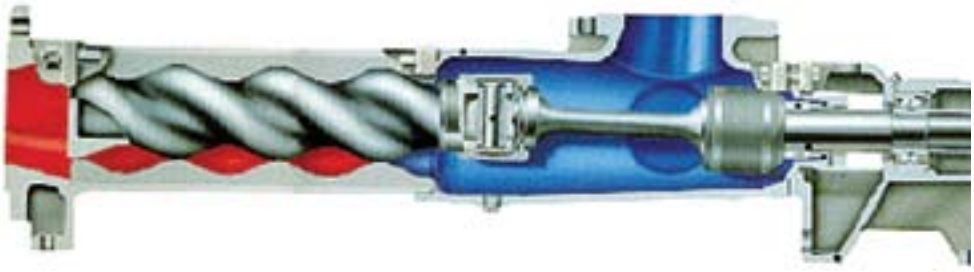
A single-acting ram pump consists of a (1)_____ moving (2)_____ and (3)_____ inside a pump chamber which is fitted with a non-return (4)_____ valve and a non-return (5)_____ valve. When the piston moves up a vacuum is formed in the chamber. The liquid is drawn into this vacuum through the (6)_____ valve. Then the piston moves down. This decreases the (7)_____ of the pump chamber creating a force on the liquid which closes the (8)_____ valve and forces the liquid out through the (9)_____ valve.

The **double-acting piston pump** works on the same principle as the single-acting pump. The chamber, however, is fitted with suction and discharge valves at the top and bottom, so the liquid can be drawn in and discharged on each stroke.

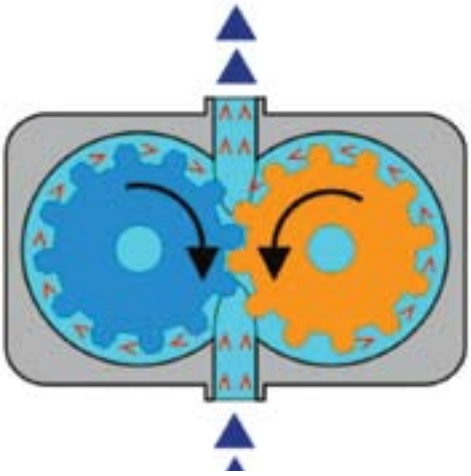
ii. Rotary pumps

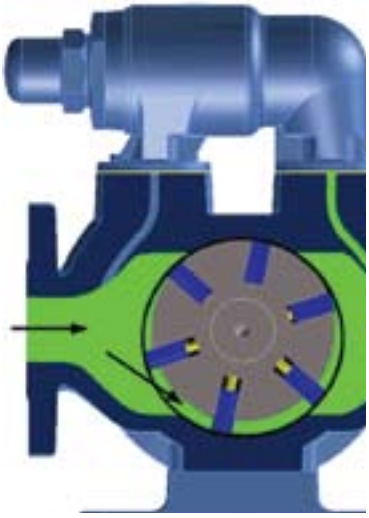
The rotary pumps operate on the same principle of displacement, but their moving part does not reciprocate; it rotates. According to the type of their rotating part they are divided into: **gear-wheeled pumps**, **screw pumps**, **vane pumps**, **lobe pumps**, etc. Rotary pumps are used mainly for oil or viscous fluids.

C. Label the diagrams of rotary pumps below. Write the correct title under each picture.



a) .....





II. Centrifugal pumps

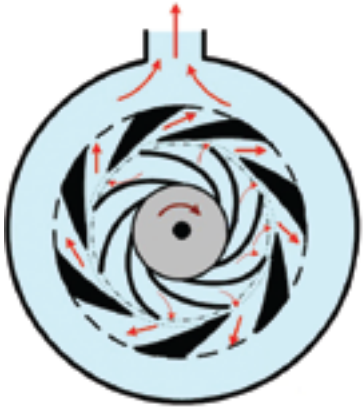
A. Read the passage and identify the types of centrifugal pumps below.

i. Write the correct type under each diagram.
ii. Write the terms shown in diagram [c]. The first letter is given.

There are three main types of centrifugal pump: the **volute**, the **diffuser** and the **regenerative**.

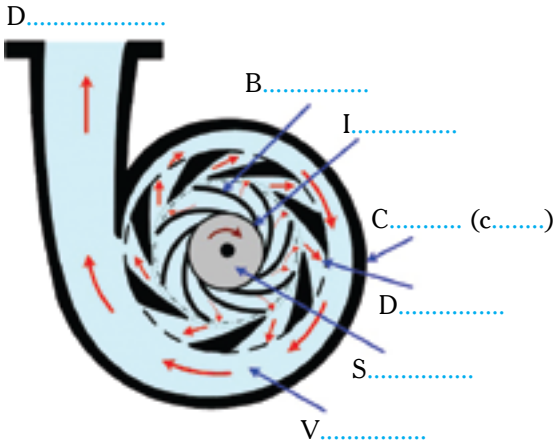
- In the volute type, the impeller is surrounded by a spiral case called volute. It is the most common type of centrifugal pump.
- The diffuser pump is a version of the volute type, but here the impeller is surrounded by diffusion vanes which are stationary (fixed). Because of this slight similarity to a reaction turbine it is often called turbine pump. The diffuser type is used on high pressure e.g. boiler feed and the regenerative type, where high pressure and small capacity are required.

- The regenerative pump is a combination of the volute around the impeller and it is surrounded by a spiral casing.



(a).....

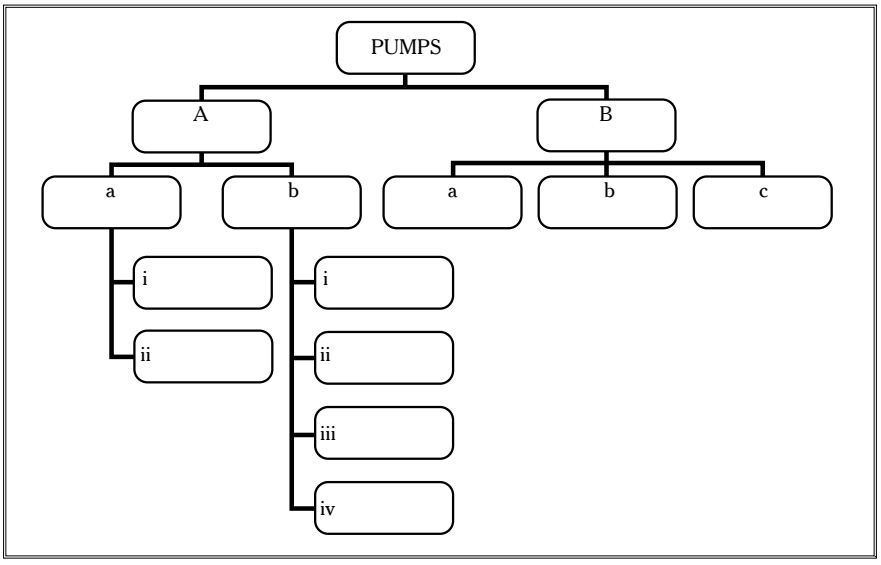
(b).....



(c).....

Centrifugal pumps can be **single-stage** (with one impeller) or **multistage** (with two or more impellers on the same shaft). With the multistage pumps we can have high capacities and high discharge pressure which is needed in cases such as boiler feeding. Centrifugal pumps, in general, are suitable for all duties except very small capacities or very low speeds. Displacement pumps, on the other hand, are not suitable for very high speeds or large capacities.	 *Multistage centrifugal pump*

B. Complete the diagram on pumps.



C. Underline the correct choice.

1. Centrifugal pumps consist of _____ inside a casing.
   a) a ram
   b) an impeller
   c) a gear wheel
2. A gear-wheeled pump is an example of a _____ .
   a) centrifugal pump
   b) displacement reciprocating pump
   c) displacement rotary pump
3. A single acting ram pump is a _____ .
   a) displacement reciprocating pump
   b) displacement rotary pump
   c) displacement centrifugal pump
4. A double acting ram pump has _____ .
   a) double pistons
   b) double suctions and one discharge
   c) double suctions and double discharges
5. In a _____ pump, the liquid is thrown against the casing of the pump.
   a) gear-wheeled
   b) centrifugal
   c) displacement
6. In a _____ pump, the vacuum is formed by the teeth on both wheels.
   a) gear-wheeled
   b) centrifugal
   c) displacement
7. In reciprocating displacement pumps there is always a(n) _____ which moves up and down in the pump chamber.
   a) piston
   b) gear
   c) impeller

8. A gear-wheeled pump is used to pump mostly _____ .
   a) water
   b) lub-oil
   c) all kinds of liquids
9. The diffuser type of pump is a _____ .
   a) rotary pump
   b) centrifugal pump
   c) reciprocating pump
10. The vane type of pump is a _____ .
    a) rotary pump
    b) centrifugal pump
    c) reciprocating pump

D. Find the pumps which the following functions correspond to.

1. It sucks and discharges liquid in each stroke of the piston: .....
2. The variation of the pump chamber volume causes the suction and discharge of the liquid: .....
3. Screws force the liquid through pump casing: .....
4. Its necessary component is the impeller: .....
5. They are not used where very high speeds are required: .....

E. In pairs, tick only the correct statements below.

1. A volute pump is a centrifugal pump. ☐
2. A vane pump is a displacement pump. ☐
3. Centrifugal pumps are not used for boiler feeding. ☐
4. All displacement pumps consist of a piston or ram. ☐
5. A screw pump is a rotary displacement pump. ☐
6. Rotary pumps are used for lub oil. ☐
7. A double-acting piston pump has two pistons. ☐
8. The diffuser pump has stationary vanes. ☐
9. In a centrifugal pump the vacuum which is formed in the pump chamber causes the suction of the liquid. ☐
10. In a reciprocating pump the liquid is thrown against the casing. ☐

F. Form 3-word compounds with the word "pump". Write them beneath.

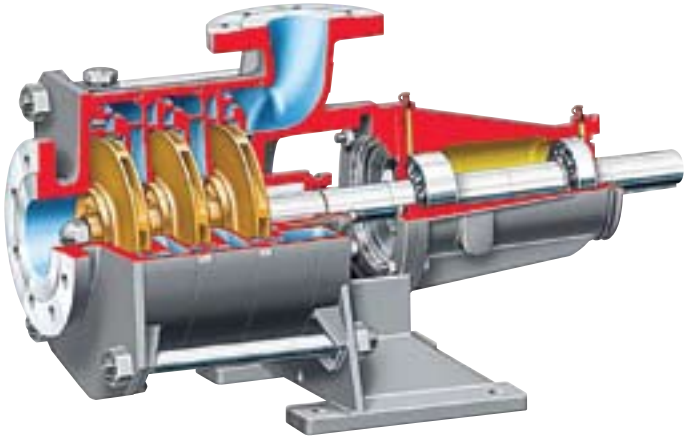
feed water fuel oil reciprocating single-acting rotary centrifugal gear emergency ~~regenerative~~	circulating displacement multistage water wheeled transfer reciprocating fire ~~centrifugal~~ vane	pump

1. ……..
2. ……..
3. ……..
4. ……..
5. ……..
6. ……..
7. ……..
8. ……..
9. ……..
10. regenerative centrifugal pump

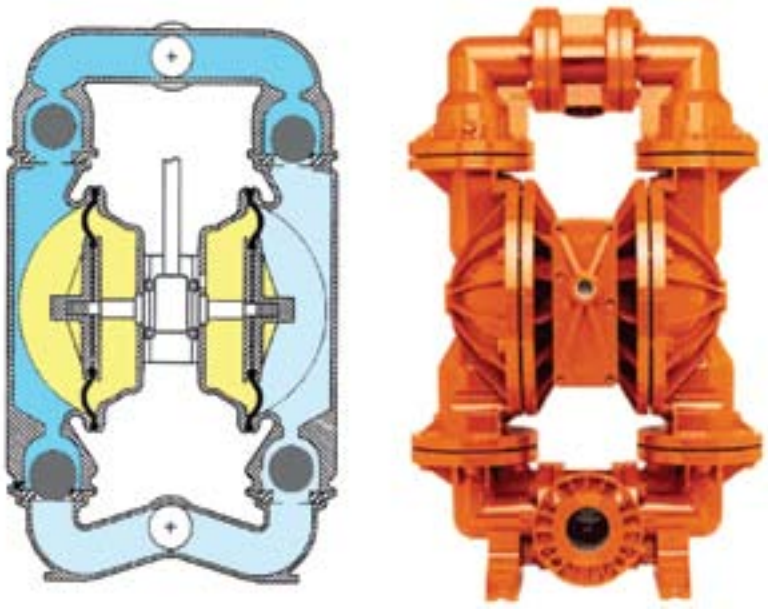
G. Discuss in class. Think of some 4-word compounds with the word "pump".

e.g. cylinder lub-oil pressure pump

H. Project: In groups of three or four, pick up one of the pumps below and prepare a presentation of its parts and operation.



Triple-stage centrifugal pump



Rotary positive displacement pump

I. Self-assessment checklist. Can you talk in English on the following topics?

Tick ☑ accordingly. Write 3-4 key words for each question and then answer the questions orally.

	Very well	Moderately well	Poorly	Key words or phrases
1. What are the names of the strokes in the four-cycle operation?				compression,
2. What are the phases of a 2-stroke cycle?				scavenge,
3. What is the turbocharger?				impeller,
4. What is the difference between a water tube and a Scotch boiler? (in terms of operation, efficiency, use)				furnace,
5. What are boiler mountings?				drain valves,
6. What are the main parts of a steam turbine?				rotor,
7. Which auxiliary machinery supply the needs of the main engine?				air compressor,
8. What are the main types of pumps?				centrifugal,
9. What are the duties carried out by pumps on board?				ballast transfer,

J. Identify what is shown in the following pictures of the Engine Room of a tanker. What is the correct caption for each picture?

Purifier room [1]	Steam turbine cargo pumps [3]	Diesel generators [5]
Air compressors [2]	Main boiler [4]	Bilge pump [6]

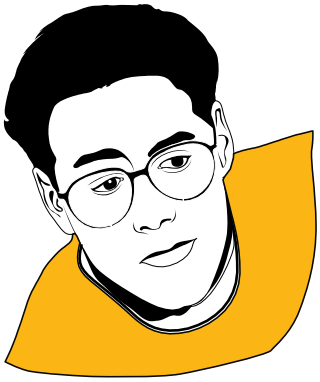





6. Visitors on board

a. Listen to the dialogue. Look at the pictures and identify the people mentioned in the dialogue. Which one is the agent? Who is the superintendent?





b. IS or HAS? Fill in.

1. The agent …….. quite thin.
2. He …….. short grey hair.
3. The superintendent …… a beard.
4. He …… bald.

c. Say the following sentences aloud. What does the "**'s**" mean in each sentence? Write "is" or "has" in the space provided.

"'s" can be the contracted form of **is** or **has**.

	is or ***has***?
Do you know Bill? He's tall and thin.	
Linda's of medium height.	
Nick's got straight, brown hair.	

I. What does s/he look like? People's physical appearance

His name is Lionel Messi.

He is from Argentina. He is a young football player (forward) who plays for Barcelona FC.

What does he look like?

He is short. He has brown eyes and straight brown hair.

To ask about a person's appearance, we say:

What does s/he look like?	S/he is	short. thin. fair.	S/he has	brown hair. full lips. blue eyes.

A. *Adjectives for describing looks and appearance. Complete the missing letters to form correct adjectives.*

1. A _ _ _ _ _ _ _ _ e : a person who is good-looking (man or woman).
2. B _ _ _ _ _ _ _ l : a person who is extremely good looking (mainly used to describe women).
3. G _ _ _ _ _ _ s : very attractive, for men and women.
4. H _ _ _ _ _ _ e : a man who is extremely good looking.
5. O _ _ _ _ _ _ y : someone who is very plain; not beautiful.
6. P _ _ _ n : someone who is very ordinary-looking.
7. S _ _ _ _ _ y : someone whose appearance is very untidy.
8. S _ _ _ t : someone who takes a lot of care over their appearance.

To describe someone's appearance use the following adjectives:

a) HEIGHT: tall, short, of medium height
b) EYES: brown, hazel (= green + brown), blue, black, etc
c) HAIR: use three different adjectives to describe size, hairstyle and colour in that order

I have	long short medium-length	straight curly wavy	black blonde brown, etc.	hair.

d) BUILD: slightly overweight, slim, slender, medium-built, etc.

B. *Adjectives that describe build. Complete the missing letters to form correct adjectives.*

1. W _ _ l-b _ _ _ t : someone whose body shape or size is bigger that the average person.
2. S _ _ _ _ y : used to describe someone who is very thin (impolite).
3. T _ _ n : someone who weighs less that the average person.
4. C _ _ _ _ y : a polite way of describing someone who is a bit overweight.
5. F _ t : a negative way to describe someone who is overweight (impolite).
6. F _ t : someone who gets a lot of exercise and is very healthy.
7. F _ _ _ _ y : someone who doesn't get much exercise, with poor muscle tone.
8. L _ _ _ e : someone who is overweight (neutral).
9. M _ _ _ _ _ _ r : someone who is very strong and has well defined muscles.
10. P _ _ _ p : a tactful way of describing someone who is overweight (British English).
11. S _ _ _ _ y : short, with a strong, solid body.

e) COMPLEXION / SKIN COLOUR: fair, dark, light brown
- Asian; light-brown skin
- Black; dark skin [*Black* in British English, *African American* in American English]
- White; fair skin

f) OTHER FEATURES (Facial features): glasses, moustache, freckles, scar, etc.

C. *Additional words. Put the words in the correct list.*

tanned	fringe	pale	big forehead	ponytail
bald	receding hairline	thin / thick eyebrows	beard	long nose

Skin: ……, ……, ……
Hair: ……, ……, ……, ……
Facial features: ……, ……, ……, ……

D. *What about you? What do you look like?*

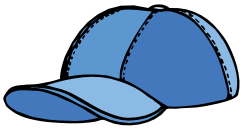
- I am ..... (HEIGHT)
- I have ..... eyes (COLOUR)
- I have ..... hair (LENGTH, HAIRSTYLE, COLOUR)
- I am ..... (BUILD)
- I have ..... (SKIN COLOUR, COMPLEXION)
- I have ..... (FEATURES)

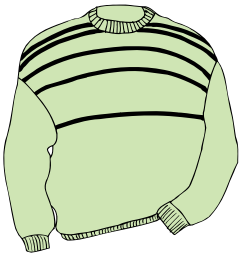
II. What is s/he wearing? Clothing for work and casual wear

A. *Match the words to the pictures of clothes.*

(a) 

(b) 

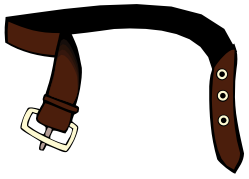
(c) 

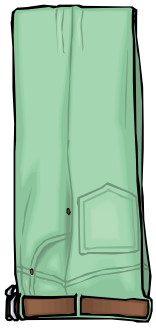
(d) 

Boots
Hat
Cap
Belt
T-shirt
Trousers
Shirt
Sweater

(e) 

(f) 

(g) 

(h) 

B. *Write the words for the clothes shown in each picture.*

(a)

(b)

(c)

(d)

(e)

(f)

(g)

(h)

a) R _ _ _ _ _ _ t
b) J _ _ _ _ t
c) S _ _ _ s
d) J _ _ _ s
e) U _ _ _ _ _ _ _ _ s
f) U _ _ _ _ _ m
g) O _ _ _ _ _ _ s
h) T _ _ _ _ _ _ s (or sneakers, sport shoes)

C. *Talk about yourself now. What are you wearing?*

D. ***Describe the person in the picture.***

- What does he look like?
- What is he wearing?

III. What is s/he like? People's character

To ask about people's character, we say:

What is s/he like?	S/he is	clever. lazy. serious.

A. ***Adjectives that describe people's personality. Complete the missing letters to form correct adjectives.***

a) Positive qualities:

1. B _ _ _ e : someone who is not afraid of danger or pain and shows courage.
2. C _ _ _ _ r : good at learning things.
3. E _ _ y-g _ _ _ g : someone who is easy to get along with.
4. G _ _ _ _ _ _ s : someone who shares his/her things with others.
5. H _ _ d-w _ _ _ _ _ g : someone who works very hard.
6. H _ _ _ _ t : someone who is truthful and who does not cheat or steal.
7. K _ _ d : someone who behaves in a caring way towards other people.
8. P _ _ _ _ e : someone who has good manners.
9. T _ _ y : a person who is very neat and well-organized.

b) Negative qualities:

1. L _ _ y : an inactive person who avoids work.
2. M _ _ n : (a) someone who is a nasty person.
   (b) someone who does not like spending money.
3. M _ _ _ y : someone who behaves differently every time you meet him/her.
4. R _ _ e : bad mannered, impolite.
5. S _ _ _ _ _ h : someone who only thinks about himself/herself.
6. S _ y : quiet and a little bit nervous around other people.
7. G _ _ _ _ y : bad-tempered.

8. V _ _ n : someone who thinks too much of his/her own appearance, abilities or worth.

B. *Choose from the adjectives above (in the previous exercise) to fill in the gaps.*

1. Tina is very _____. Yesterday she said hello; today she just ignored me.
2. Coastguards must be very _____. One of their duties is to rescue people in difficult circumstances.
3. My niece is a very _____ teenage girl. She always says please and thank you. But as she is growing up I think she is becoming a bit _____, she spends too much time looking in the mirror!
4. The manager gave all the employees of the company a really big bonus. It is the first time he is being so _____.
5. If you want to find out what really happened, ask Tom. He is very _____, he always tells the truth.

C. *Match the adjectives to the definitions.*

talkative	creative	bossy	ambitious	anxious
~~sociable~~	dependable	bad-tempered	impulsive	~~introvert(ed)~~

1. _____ – someone who is very reliable.
2. _____ – someone determined to be successful, rich, powerful, etc.
3. introverted – someone who is quiet and shy (≠ extroverted, out-going).
4. _____ – someone who acts before thinking.
5. _____ – someone who worries a lot.
6. _____ – someone who gets angry a lot.
7. _____ – someone who tries to control other people.
8. _____ – someone who is an original thinker or who has artistic skills.
9. sociable – someone who enjoys mixing with people.
10. _____ – someone who talks a lot.

D. *Choose from the words in the previous exercise to fill in the gaps.*

1. The Chief Mate is really …… . He is always shouting at the ratings.
2. He is very …… . He is hoping to be promoted soon.
3. My girlfriend is a bit …….. . She's always ordering me around.
4. The new cadet is very ……..; he has a lot of friends.
5. She's a …….. child who'll talk to anyone.
6. My brother can be a bit ……; he doesn't always think before he acts.

Modifiers for adjectives:

Very, *quite*, *slightly* are modifiers; they change (modify) the adjectives. You can use modifiers for the descriptive adjectives you are using, like:

S/he is	very / really quite slightly / a bit, etc.	selfish.

E. *Personality Questionnaire: In pairs, ask each other the following questions and describe each other's character.*

a) Ask your partner the following questionnaire questions and note down his/her answers.

What are you like?	YES	NO	Character trait
Do you often give presents, or pay for lunch or a coffee?	☐	☐	
Do you work hard?	☐	☐	
Do you often change opinion about things?	☐	☐	
Do you think the future will be good?	☐	☐	
Are you usually in a good mood?	☐	☐	
Can people trust you with a secret?	☐	☐	
Is it important for you to be successful in whatever you do?	☐	☐	
Do you become angry or annoyed if you have to wait for something or someone?	☐	☐	

b) Which of the following adjectives describe the quality asked about in each of the survey questions? Write them in the "character trait" column of the questionnaire.

- Cheerful
- Ambitious
- Generous
- Hard-working
- Impatient
- Trustworthy
- Optimistic
- Indecisive

c) Tell the class what you have learnt about your study partner. Try to use adjective modifiers.

e.g. S/he is quite optimistic as a person.

F. *Word Grid.*

a) Find 10 adjectives that describe personality in the following word grid. Look for them horizontally and vertically.

S	E	L	F	I	S	H	B	I	T	P	U
A	T	H	E	N	H	Z	U	B	L	O	W
G	R	U	M	P	Y	E	L	R	O	L	A
E	C	K	O	F	R	I	E	A	D	I	M
B	A	N	O	S	M	A	R	V	O	T	E
I	B	A	D	T	E	M	P	E	R	E	D
L	A	Z	Y	F	A	R	I	K	O	N	T
O	X	Y	G	E	N	E	R	O	U	S	E

b) Which of the adjectives are positive and which ones are negative character traits? List them in the space provided below.

(+)	(–)
……..	……..
……..	……..
……..	……..
	……..
	……..
	……..
	……..

G. *Use adjectives to describe your character and your best friend's character.*

1. What are you like?

I'm……
……
……
……

2. What is your best friend like?

S/he's ……
……
……
……

H. *Read the letter. The cadet is writing about two of the ship's officers.*

MV Pride
Esperance,
March 2011-03-07

Dear George,

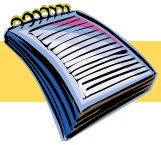
We are in Australia now, and we are **bound for** China tomorrow. Thank you for the magazines you sent me. I'm slowly **getting used to** the routine onboard. The people here are fine; I have no particular problem with any of them.

The Captain's name is Kostas. He is very young, only 34 years old and he is single, I think he is engaged to be married. He is tall, with short black hair. He is very fit, he exercises in the gym a lot. He never drinks alcohol or smokes. He is **committed**, and he takes his work very seriously. He is very dependable **work-wise**. I trust him completely. And he is **fair,** he does not do injustice to anyone.

The Chief Engineer, Sotiris, is around 48 or 50. He is short and **stout**, with a **beer belly**. He smokes a lot. He is very easy-going and you can talk to him about anything. He is like a father to me. He has two young daughters and says he might become my father-in-law one day. He is very helpful, hard-working, creative and good at his job.

Talk to you soon,
Fanis

a) Use the words that are written in bold in the letter to fill in the glossary below.



Glossary

.....	willing to work hard and give his time and energy to something; dedicated
.....	rather fat, plump
.....	ready to travel to a particular place
.....	treating people equally
.....	a man's fat stomach caused by drinking a lot of beer over a long period
.....	as regards work
.....	becoming familiar with something so that it no longer seems new or strange to you

b) Write sentences comparing the Captain to the Chief Engineer.

The Chief Engineer **is older than** the Captain.

.....
.....
.....
.....
.....

I. ***Write detailed descriptions of two people you worked with during your training voyage (the Master, Chief Officer, Second Officer, Chief Engineer, Second Engineer, Bosun, etc.) What do they look like? What are they like? Compare them.***

.....
.....
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Part Three

1. Fuels

Introduction: Bunkering procedure

A. Explain what the following keywords mean.

- ⇨ Secure alongside
- ⇨ Bunker hose
- ⇨ Fenders
- ⇨ Manifold
- ⇨ Drip sampling
- ⇨ Pumping
- ⇨ Supply tanker/barge

B. High Seas Bunkering: Listen to the steps of a high seas bunkering procedure (as described by a bunker supply company).

i. Put the procedure steps in the correct order. Write the appropriate number (1-7) in the space provided. Two numbers are given for help.

_____ Connecting bunker hose to manifold.
_____ Using the ship's crane to hoist the bunker hose.
__3__ Vessel's deck crew opening the manifold.
__5__ Attaching bottle for drip sampling in the supply tanker.
_____ Securing supply tanker alongside the vessel.
_____ Pumping starts.
_____ Vessel drip sampling for quality control.

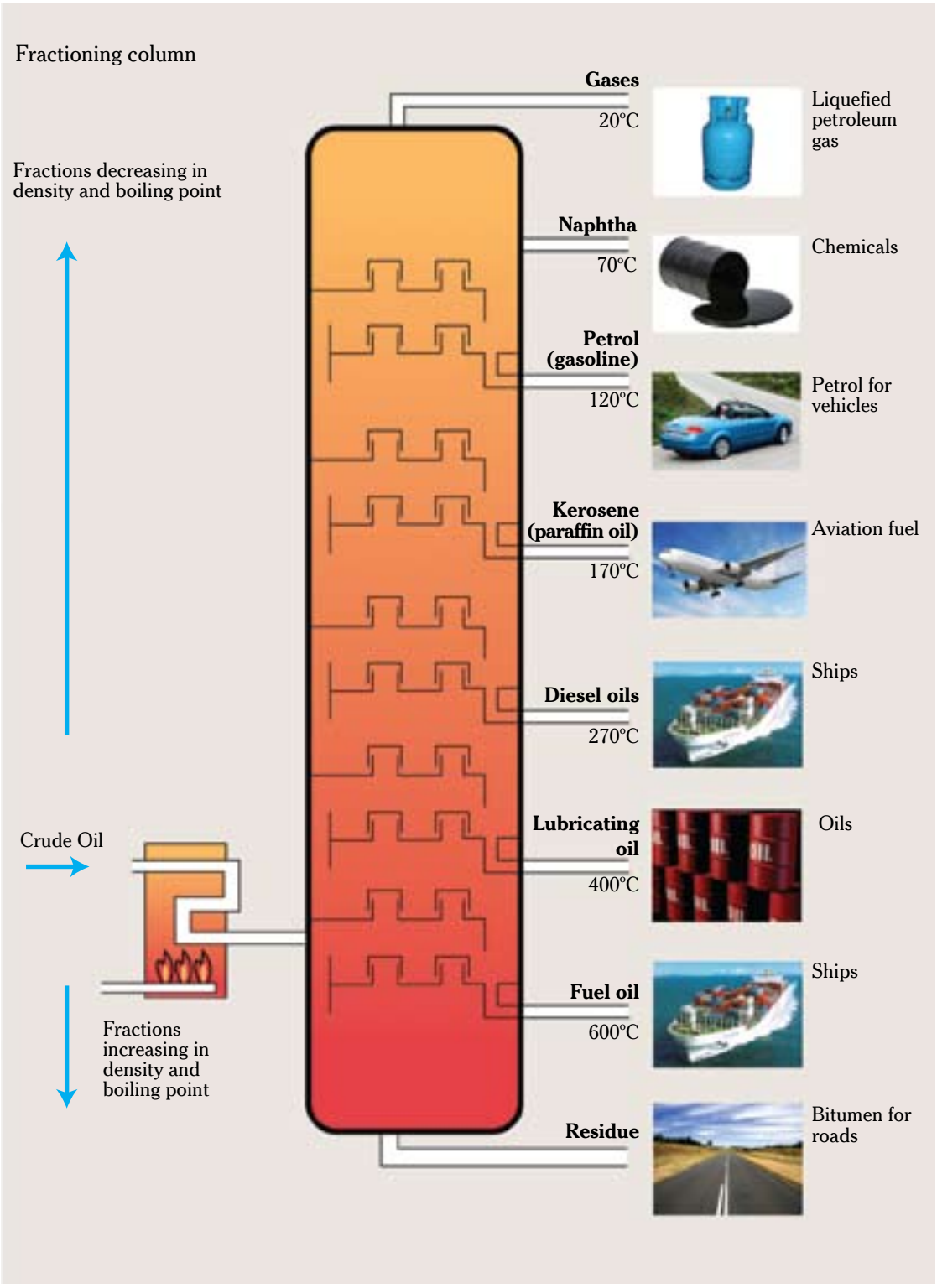
ii. Listen again to fill in the gaps with the correct words / phrases in the following sentences.

1. An adequate number of Yokohama _____ are placed on the supply tanker depending on weather conditions.
2. After the manifold is opened, the supplier hands over the _____ button to the vessel.
3. Samples are sealed for later verification of supplied product quality in case a _____ _____ arises.
4. The _____ is up to 600 m^3/h.
5. There is _____ between the crews about pumping speed.
6. The supply tankers are _____-hulled, state of the art tankers.

I. HFO / MDO

Lead-in:

A. What is going on in this tower (column)?



Fractional distillation is the process through which the products (fractions) of crude oil are obtained at different points of the distilling tower (column), according to their boiling temperatures.

B. Useful vocabulary: Write the following words in the glossary below.

distillate / treatment / crude oil / viscosity / sludge / distil / residue

Glossary

.....	the oil as it is obtained from an oilfield
.....	refine
.....	product of distillation
.....	process for improving quality
.....	what remains left over
.....	mud, dirt
.....	property of a liquid showing how easily it flows

C. Quiz. Answer the following questions. For extra help, choose the answers from the list that follows.

1. What do marine fuels come from?
2. Through what process are they obtained?
3. Which fuels are mainly used in marine diesel engines?
4. How do we call the fuels that are refined petroleum products?
5. How do we call the fuels that come from the residues of petroleum distillation?
6. The quality of a fuel is expressed by this word, which basically indicates how well a fuel will burn in the cylinders. Which word is it?
7. Which fuel is a low-grade oil and has a high viscosity?
8. Which fuel is a high-grade oil of lower viscosity than HFO (which means that it is thinner than HFO, and therefore it will flow more easily)?
9. How do we call any fuel whose grade lies between HFO and DO?

• residual fuels, e.g. Heavy Fuel Oil (HFO)	• crude oil	• Heavy Fuel Oil (HFO)
• fractional distillation	• Marine Diesel Oil (MDO/DO)	• distillates, e.g. gasoline (petrol)
• Intermediate Fuel Oil (IFO)	• grade	• Marine Diesel Oil (MDO) & Heavy Fuel Oil (HFO)

D. Work with your partner to compare the two types of marine fuels in terms of use and properties by putting the characteristics of each type of fuel in the correct list below.

no special treatment needed	produces sludge	expensive	it needs treatment (heating & purifying) due to its higher viscosity
cheaper	used in manoeuvring	less dirty	produces dirtier exhaust gas

MDO	HFO
.....	.....
.....	.....
.....	.....
.....	.....

E. Read the text below to check your answers. Do you agree with the writer? Underline the properties of the fuel in the text.

Fuel is an important criterion for the choice of the engine, since more than 50% of the total running cost of the ship is due to fuel consumption. Marine diesel oil is best because it produces less dirt and does not need special treatment, but it is expensive. It may be used when the vessel is manoeuvring. Heavy fuel oil is much cheaper but it produces sludge and dirtier exhaust gases. It contains more sulphur than diesel and, having a higher viscosity, it cannot be pressed through injectors without treatment. It needs heating to decrease viscosity and purifying to eliminate water and dirt particles, too big to pass through the injector. Heating is done in fuel heaters mostly by electric heating, and cleaning is done in separators, centrifuges, where water and heavy particles are separated from the oil.

Do you agree with the following statement? Discuss in class.

"Nowadays diesel oil is no more used in marine diesel engines (due to its high cost). Heavy fuel oil is used in all cases (with a slight addition of diesel)."

F. When assessing the quality of a fuel, we must take into consideration a large number of standard properties of fuels that will determine its grade. The following list of terms includes the most important parameters of fuel oils for Diesel engines. In pairs, match the terms with the appropriate explanation.

cetane number, viscosity, specific gravity, pour point, flash point, sulphur, carbon residue, ash content, water and sediment, heating value

1.
2.

1. The lowest temperature at which the oil will flow.
2. Chemical element(s) which can be very injurious to engine parts during combustion because it/they change(s) into acid.

3.	3. The temperature (approx. 150° F) at which the fuel vapors produce a flash (ignite) when a flame is applied to it.
4.	4. Unburned carbon (C) during combustion which can deposit on engine parts.
5.	5. The measure of the resistance of the fuel to movement. The higher it is, the more difficult for the fuel to flow.
6.	6. Non-combustible solid material in the fuel which scratches the rubbing surfaces it comes in contact with.
7.	7. The amount of heat (e.g. B.t.u.) given off on complete combustion of one pound of fuel (also called "specific energy").
8.	8. A measure of the density or weight of the fuel. It also serves as a rough check on viscosity, carbon content and other qualities.
9.	9. An indication of the quality of the ignition of the fuel.
10.	10. Content in water and solid particles. The higher it is, the more possible it is to cause erratic combustion and corrosion.

G. Are the following statements True or False? Discuss with your study partner.

1. The higher the viscosity of a fuel oil, the more heating it needs to reduce it.
2. Around the pour point the fuel can hardly be pumped and needs heating.
3. Sulphur is extremely harmful to metal surfaces when it turns into sulphuric acid.
4. Heavy fuel oils form more carbon deposits because they have a lower carbon residue figure.
5. Carbon deposits can be formed in every part of the engine.
6. The cetane number of a fuel oil should be proportional to the engine speed.
7. High water content in the fuel does not affect combustion whatsoever.
8. High specific gravity does not necessarily imply highly viscous fuel.
9. Sediment is formed when suspending solid particles in the fuel coagulate and sink down.
10. Heating value is the amount of heat given off on complete combustion of one litre of fuel.

Note: Remember the following comparative structure: ***the more..., the more...***
"The higher the viscosity of a fuel, the more heating is needed to reduce it."
"The higher the r.p.m. of the engine, the higher the required cetane number."

II. Marine Fuel Oil Standards

The international ISO-standard is used in order to be able to assess the quality of marine fuels. The following table[1] displays the latest standards for marine distillate fuels and marine residual fuels.

Marine Distillate Fuels

Parameter	*Unit*	*Limit*	*DMX*	*DMA*	*DMZ*	*DMB*
Viscosity at 40°C	mm^2/s	Max	5.500	6.000	6.000	11.00
Viscosity at 40°C	mm^2/s	Min	1.400	2.000	3.000	2.000
Micro Carbon Residue at 10% Residue	% m/m	Max	0.30	0.30	0.30	-
Density at 15°C	kg/m^3	Max	-	890.0	890.0	900.0
Micro Carbon Residue	% m/m	Max	-	-	-	0.30
Sulphur[a]	% m/m	Max	1.00	1.50	1.50	2.00
Water	% V/V	Max	-	-	-	0.30[b]
Total sediment by hot filtration	% m/m	Max	-	-	-	0.10[b]
Ash	% m/m	Max	0.010	0.010	0.010	0.010
Flash point	0°C	Min	43.0	60.0	60.0	60.0
Pour point, Summer	0°C	Max	-	0	0	6
Pour point, Winter	°C	Max	-	-6	-6	0
Cloud point	°C	Max	-16	-	-	-
Calculated Cetane Index		Min	45	40	40	35
Acid Number	mgKOH/g	Max	0.5	0.5	0.5	0.5
Oxidation stability	g/m^3	Max	25	25	25	25[c]
Lubricity, corrected wear scar diameter (wsd 1.4 at 60°C[d])	um	Max	520	520	520	520[c]
Hydrogen sulphide[e]	mg/kg	Max	2.00	2.00	2.00	2.00
Appearance			Clear & Bright[f]			[b, c]

a. A sulphur limit of 1.00% m/m applies in the Emission Control Areas designated by the International Maritime Organization. As there may be local variations, the purchaser shall define the maximum sulphur content according to the relevant statutory requirements, notwithstanding the limits given in this table.
b. If the sample is not clear and bright, total sediment by hot filtration and water test shall be required.
c. Oxidation stability and lubricity tests are not applicable if the sample is not clear and bright.
d. Applicable if sulphur is less than 0.050% m/m.
e. Effective only from 1 July 2012.
f. If the sample is dyed and not transparent, water test shall be required. The water content shall not exceed 200 mg/kg (0.02% m/m).

1. ISO 8217 Fourth Edition 2010, Source: DNV (Det Norske Veritas) Managing Risk, www.dnv.com

Marine Residual Fuels

Parameter	***Unit***	***Limit***	***RMA***[a]	***RMB***	***RMD***	***RME***	***RMG***				***RMK***		
			10	***30***	***80***	***180***	***180***	***380***	***500***	***700***	***380***	***500***	***700***
Viscosity at 50°C	mm^2/s	Max	10.00	30.00	80.00	180.0	180.0	380.0	500.0	700.0	380.0	500.0	700.0
Density at 15°C	kg/m^3	Max	920.0	960.0	975.0	991.0	991.0				1010.0		
Micro Carbon Residue	% m/m	Max	2.50	10.00	14.00	15.00	18.00				20.00		
Aluminium + Silicon	mg/kg	Max	25	40		50	60						
Sodium	mg/kg	Max	50	100		50	100						
Ash	% m/m	Max	0.040	0.070			0.100				0.150		
Vanadium	mg/kg	Max	50	150			350				450		
CCAI	-	Max	850	860			870						
Water	% V/V	Max	0.30	0.50									
Pour point (upper)[b], Summer	°C	Max	6	30									
Pour point (upper)[b], Winter	°C	Max	0	30									
Flash point	°C	Min	60.0										
Sulphur[c]	% m/m	Max	Statutory requirements										
Total Sediment, aged	% m/m	Max	0.10										
Acid Number[e]	mgKOH/g	Max	2.5										
Used lubricating oils (ULO): Calcium and Zinc; or Calcium and Phosphorus	mg/kg	-	The fuel shall be free from ULO, and shall be considered to contain ULO when either one of the following conditions is met: Calcium > 30 and zinc >15; or Calcium > 30 and phosphorus > 15.										
Hydrogen sulphide[d]	mg/kg	Max	2.00										

a. This residual marine fuel grade is formerly DMC distillate under ISO 8217:2005.
b. Purchasers shall ensure that this pour point is suitable for the equipment on board, especially in cold climates.
c. The purchaser shall define the maximum sulphur content according to the relevant statutory requirements.
d. Effective only from 1 July 2012.
e. Strong acids are not acceptable, even at levels not detectable by the standard test methods for SAN. As acid numbers below the values stated in the table do not guarantee that the fuels are free from problems associated with the presence of acidic compounds, it is the responsibility of the supplier and the purchaser to agree upon an acceptable acid number.

A. Study the tables on the previous two pages and answer the following questions.

1. Which parameters of the fuels have not been mentioned so far? Underline them on the tables.
2. How do they affect combustion or engine parts?
3. CCAI in residual fuels stands for *Calculated Carbon Aromaticity Index*. What does it affect? How?
4. Which parameters (new specifications) came into force on 1 July 2012?

B. What do the following words mean? Match them to the definitions below.

emission, applicable, effective, ~~statutory~~, purchaser, corrosion, eliminate, content, inadmissible, fuel grade

1. type of fuel .....
2. able to be applied and to be done .....
3. unacceptable, beyond the limit .....
4. get rid of, expel, remove .....
5. discharge of gases, smoke, etc. .....
6. oxidation leading to rust .....
7. what is included, contained .....
8. brought into force, valid .....
9. the person who buys something .....
10. laid down by law, legislated statutory

C. Circle the odd word out.

1. refine, purify, prepare, clean, distil
2. deposit, residue, sludge, froth, sediment
3. adjust, regulate, compare, control, check
4. corrosion, wear, rust, scoring, grinding
5. define, include, contain, enclose, comprise

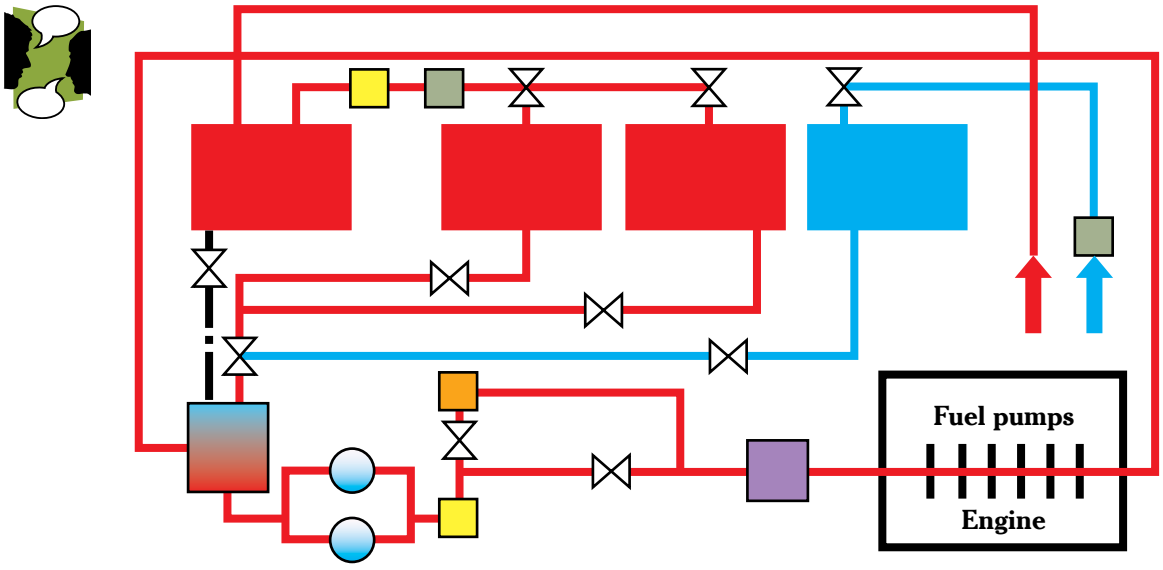
III. Fuel Oil System

A. Quiz. Answer the following questions. For extra help, choose the answers from the list that follows.

1. Where are the fuels (heavy or diesel) stored?
2. When is the engine run on diesel oil?
3. How is the fuel cleaned?
4. What is the function of the settling tank?
5. What is the function of the buffer tank? How else is this tank called?
6. What does the booster pump do?
7. What does the viscosity regulator do?
8. How is the change over from diesel to heavy fuel oil done?

• for manoeuvring	• it allows the used oil from the engine to be mixed with a new charge / mixing, balancing, venting tank	• with a three-way valve
• in the double bottom tanks	• it allows water and thick particles to sink down	• it raises the pressure of fuel
• by centrifuge	• it adjusts the temperature of the fuel	

B. The following is a simplified diagram of the fuel oil system of a diesel engine. Work with your partner to show the parts in the diagram (draw arrows and write the names of the parts; some of the terms are used twice).



settling tank, DO tank, HFO service tank, buffer tank, booster pumps, viscosity regulator, strainer (fine filter), centrifuge (separator), heater, drain valve of the settling tank

⇨ Describe the circulation of HFO / DO.

C. Trace the circulation of heavy fuel oil on the diagram, mark it and explain it in simple sentences. Your study partner will do the same with the circulation of diesel oil.

D. The following sentences describe the circulation of HFO/DO. Look at the diagrams below. They show different stages of the circulation (marked with a darker colour). Which sentence describes what is shown in each diagram? Write the correct sentence (1-8 or a-d) under each picture.

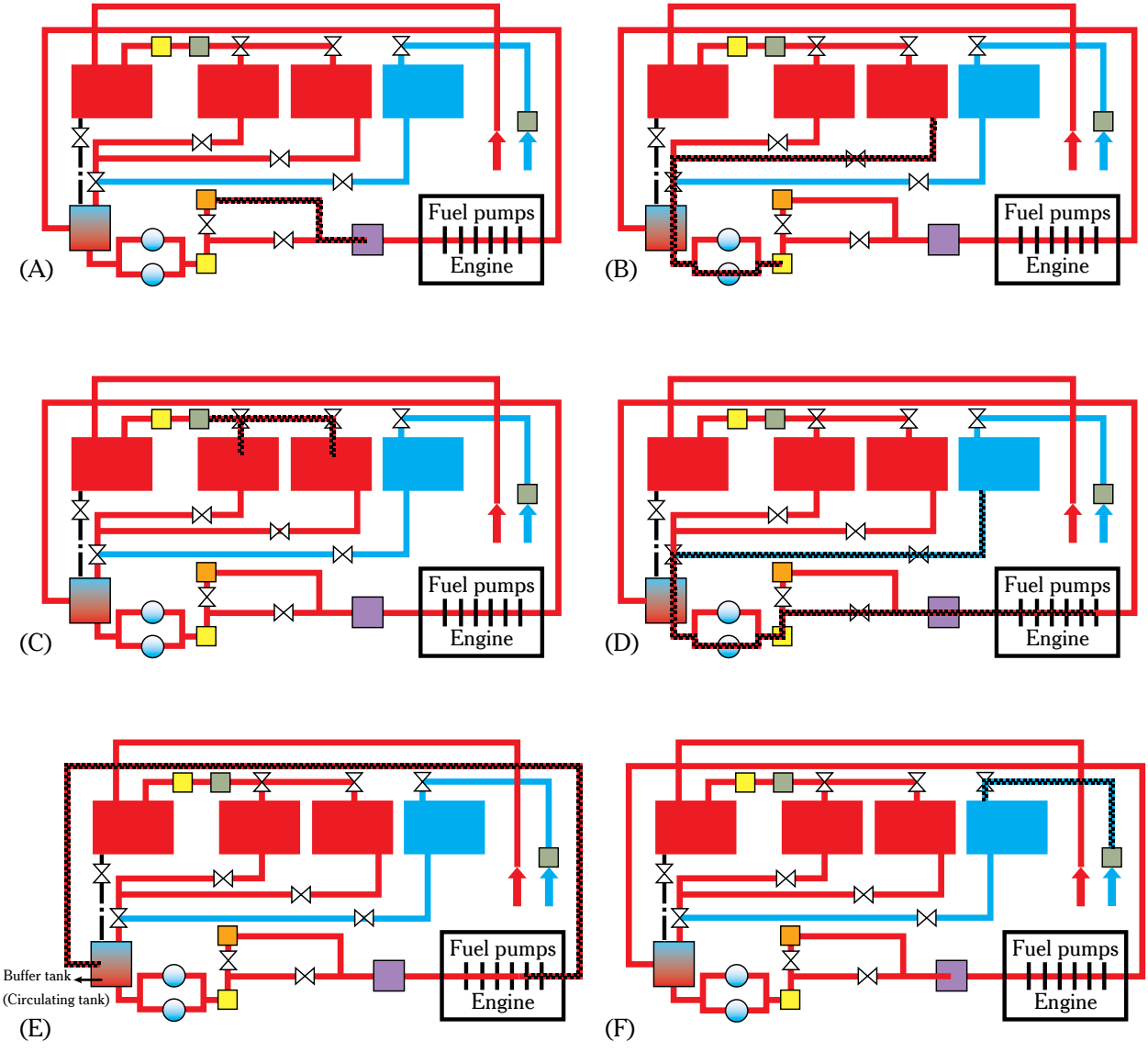
HFO

1. From the HFO bunker tank the preheated fuel is led to the settling tank.
2. From the settling tank the fuel passes through a heater to preheat the fuel.

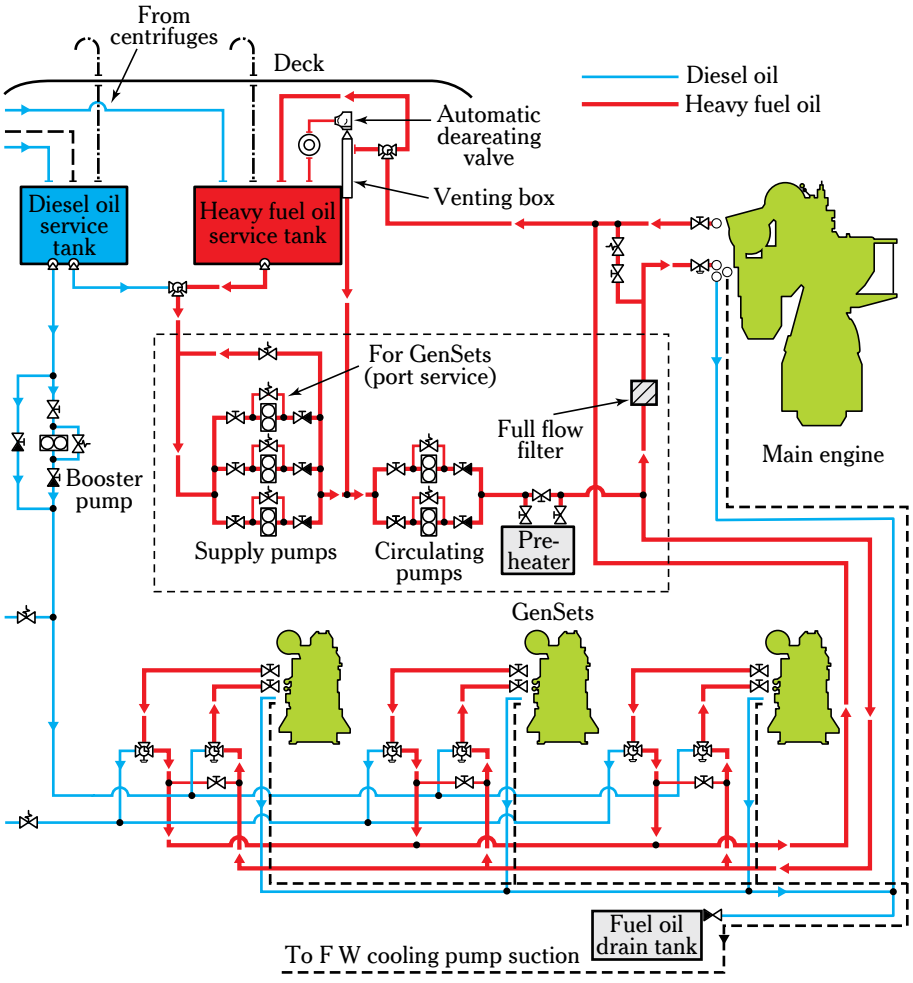
3. From the heater the fuel is led through a separator (purifier/clarifier) to purify the fuel.
4. From the separator the fuel enters the daily service tank.
5. From the daily service tank the fuel is pumped to a heater by the low pressure fuel pump.
6. From the heater the HFO passes through a viscosity regulator.
7. From the viscosity regulator the fuel passes through a strainer, which filters the fuel.
8. From the strainer the oil is led to the fuel pumps in the engine.

MDO

a) From the DO storage tank the fuel passes through a purifier.
b) From the purifier the DO enters the DO service tank.
c) From the DO service tank the fuel is led to the high-pressure fuel pumps in the engine.
d) In some cases, a mixing tank is used for the gradual transition from HFO to DO. The mixing tank, or "buffer tank", can hold a quantity of fuel which will be circulated and led to the engine.



E. Read the text about a typical fuel oil system and complete the words / phrases that are missing. The diagram and the previous exercises will help you.



The fuel is stored on board, in tanks, the bunkers; in cargo ships, often in the (1)..... ..... tanks. From there the heavy oil is pumped into a (2)..... where water and heavy dirt sink down. Then it is fed through a (3)..... and next through a (4)..... where the oil is (5)..... from all heavy particles. Water and dirt go to the sludge tank.

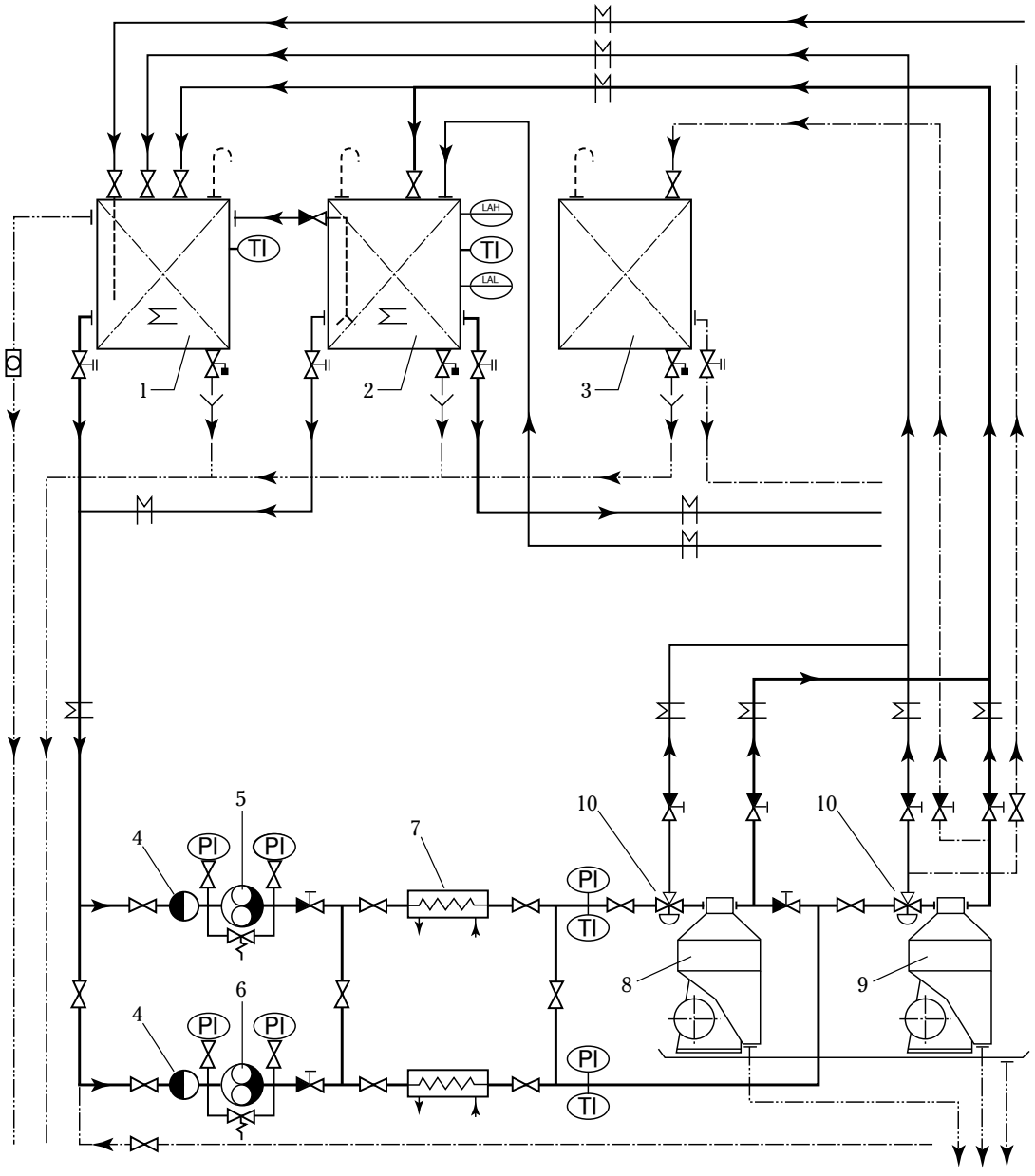
Then the clean oil is pumped into the heavy oil (6)..... which are in duplicate, as one is in use, while the other is being (7)..... . From there the oil, after passing through the (8)..... tank, is pumped by (9)..... ..... or high pressure pumps into a heater and right after into a (10)..... ....., which automatically (11)..... the temperature of the oil.

Finally, the oil is discharged through a fine (12)..... to the main engine fuel pump suctions. A (13)..... regulating valve is also fitted in the system, and the surplus of oil returns to the heavy oil service tank or to the buffer tank.

A three-way valve or a change-over valve allows us to operate the engine on diesel oil. The diesel is a (14)..... oil and does not pass through a settling tank. So, after it has been pumped from the storage tank, it (15)..... through a centrifuge for purification and enters the diesel oil tank.

The fuel-oil system can be a ***closed feed system*** or an ***open feed system*** where all the parts of the system are outside the engine. The following two diagrams comprise the ***initial*** and ***final*** part of an ***open feed fuel oil system***.

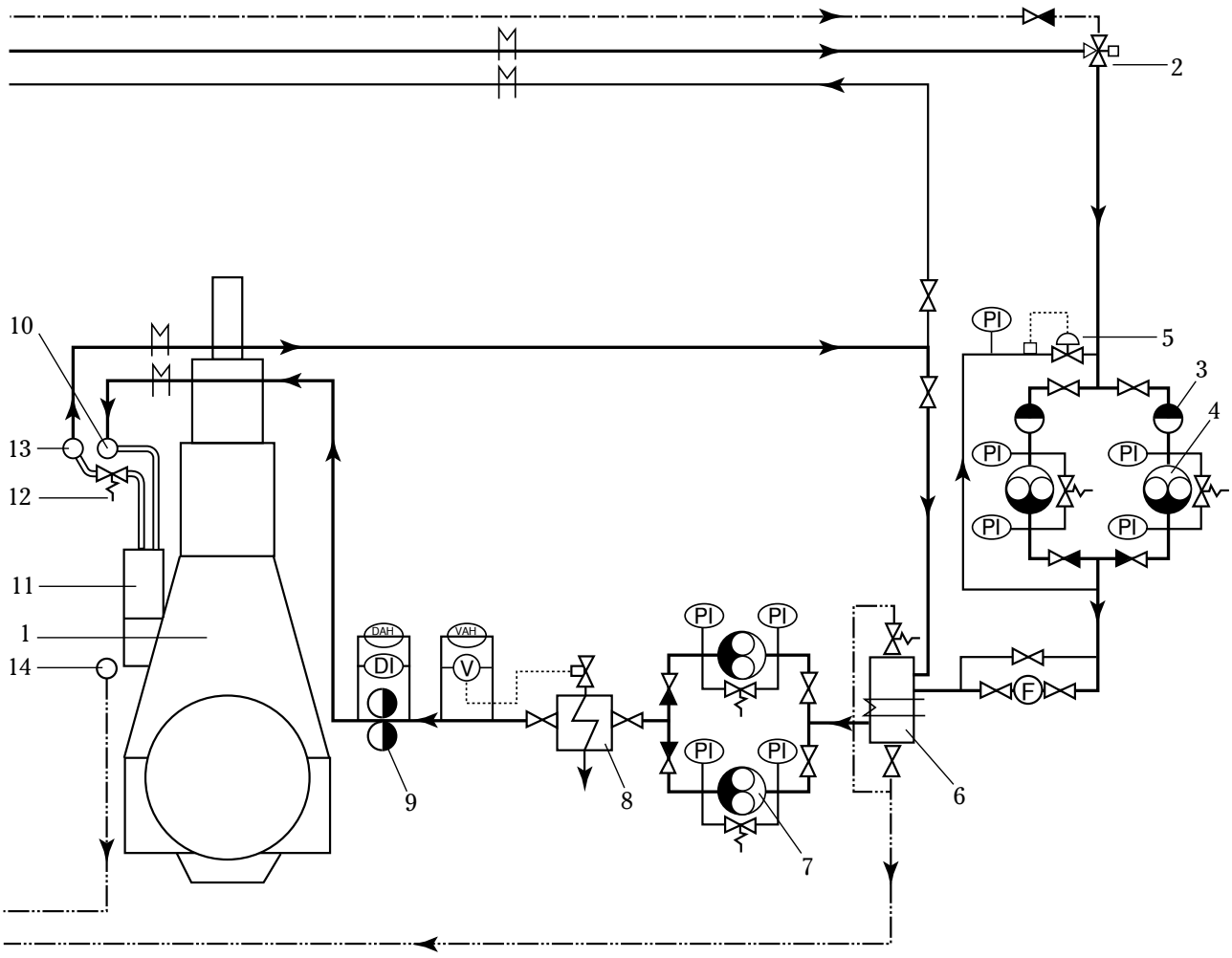
F. Fill in the missing terms in the diagrams.



Initial part of open feed heavy fuel oil system

1. _____
2. HFO daily tank, heated and insulated
3. _____
4. Suction filter
5. HFO separator supply pump
6. HFO/MDO separator supply pump
7. _____
8. _____
9. Clarifier – self-cleaning HFO/MDO separator
10. _____

Three-way valve	MDO daily tank	HFO settling tank	Purifier (HFO separator)	HFO pre-heater



Final part of open feed heavy fuel oil system

1. _____
2. Three-way valve, manually or remotely operated
3. Suction filter, heated – trace heating acceptable
4. Low pressure feed pump _____
5. _____
6. _____
7. _____
8. Fuel oil endheater
9. Fuel oil filter, heated – trace heating acceptable
10. Fuel oil inlet
11. Fuel injection pump
12. Pressure retaining valve
13. Fuel oil outlet
14. Fuel oil leakage from fuel pump

Pressure regulating valve	High pressure booster pumps	Main engine	Mixing unit

G. Choose one of the diagrams and describe it orally.

Useful verbs:
is pumped / is led / passes / goes through / is stored / is filtered

H. Match the terms to their definitions.

1. to insulate	☐ balancing tank, mixing tank
2. buffer tank	☐ to go down, sink
3. pressure retaining valve	☐ to increase, push up, enhance
4. sludge	☐ to disperse through outward movement
5. to settle down	☐ excess
6. to centrifuge	☐ to lag, to wrap up, to protect against heat dispersal
7. to boost	☐ to control, adjust
8. to regulate	☐ pressure reducing valve
9. to purify	☐ to remove impurities, to clean
10. surplus	☐ mud, deposits of fuel

I. Fill in the missing letters for the various tanks (some letters are already provided).

1. st _ _ _ _ e tank (= b _ _ _ _ r tank)
2. d _ _ _ _ e-b _ _ _ _ m tank
3. s _ _ _ _ _ _ g tank
4. d _ _ _ y tank (= se _ _ _ _ e tank)
5. b _ _ _ _ r tank (= m _ _ _ _ g tank)
6. sl _ _ _ e tank
7. fuel oil d _ _ _ n tank

J. What would the following properties of fuels cause to the fuel system and the parts of the engine? Discuss in groups of four (the first one has been done for you).

1. A fuel with a very low cetane number ….would cause delay in ignition of the fuel. This subsequently would lead to "knocking" of the engine and mechanical wear of its parts.
2. A highly viscous fuel _____
3. A fuel with high sulphur content _____
4. A fuel with high ash content _____
5. A fuel with high carbon residue _____
6. A fuel with high water and sediment content _____

IV. Fuel Injection

A. Read the text below and fill in the missing words.

hydraulically, injection, multi-atomizer, insufficient

The last stage of the fuel oil system is the (1) …….. of the fuel in the combustion chamber. This is done by the fuel injectors which are fitted on the cylinder head. Their main function is to inject and *disperse* in a form of spray a certain amount of fuel in the combustion chamber.

The normal burning of the fuel and the efficient running of the engine depend on the *precise* and *timely* operation of the fuel injectors. Incorrect injection timing can cause the engine not to start or to be hard to start. It can also cause lack of power or cause the engine to produce white smoke as there is (2) ……..…….. temperature to properly burn the fuel. A faulty injection pump can be the *culprit* behind a *stalling* engine or a rough running engine. Fuel injectors are distinguished into single *atomizer* and (3) ……..…… injectors. Most injectors are operated (4) …… .
In 4-stroke diesel engines, besides the main fuel injector, there may be a *piloting* injector as well, fitted at the side of the cylinder cover.

B. Which words in the passage above mean the following? (they are marked with italics for help)

1. to spread all over
2. secondary, subordinate
3. opening through which fuel is sprayed
4. exact
5. at the right time
6. reduction of revolutions, eventual stopping of the engine
7. reason

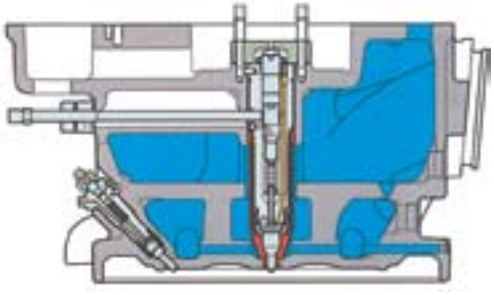
C. Read the text below and do exercises (i) and (ii) that follow.

A fuel injector consists of three main parts; the injector holder, the needle with its stem and return spring and the nozzle assembly.

Inside the cylindrical holder there is a centrally formed cylindrical case where the needle stem and its return spring are fitted. Parallel to this runs the fuel inlet pipe.

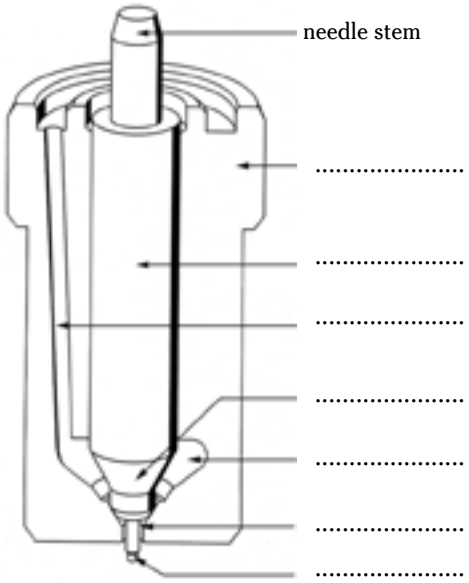
The nozzle assembly is screwed at the bottom of the injector holder. It has one or more atomizers through which the fuel is sprayed into the combustion chamber. The pressure chamber is a hollow space inside the assembly which ends to a tapered seat where the injector needle ends too.

Fuel injectors (a) main, (b) piloting (on a different size scale)



Piloting and main injector in Diesel engine cylinder head

i. Which part of the injector does the following picture show?



ii. Fill in the missing terms in the picture above.

needle tip	atomizer	tapered pressure seat	pressure chamber
~~needle stem~~	nozzle assembly	needle	fuel inlet pipe

Vocabulary consolidation

D. Underline the correct word or phrase.

1. The element which causes oxidation to the engine is …… .
   a. silicon b. carbon c. sulphur
2. The time of ignition of the fuel is directly influenced by …….. .
   a. the cetane number b. the water content c. the ash content of the fuel
3. The fuel needs heating when it is close to its …….. .
   a. flash point b. pour point c. injection point
4. The fuel resists to flowing when its viscosity is …….. .
   a. low b. high c. at a medium rate
5. Heavy fuel oil is …….. diesel oil.
   a. more viscous than b. less viscous than c. as viscous as
6. The used fuel is mixed with a new charge in the …….. .
   a. service tank b. settling tank c. balancing tank
7. The fuel is sprayed into the cylinder by the ……..…….. valve.
   a. inlet b. ignition c. injection
8. The lowest part of the fuel injection valve is the …….. .
   a. nozzle assembly b. injector holder c. needle

9. The acronym CCAI stands for …… .
   a. calculated calcium aroma indication
   b. cracked carbon atom index
   c. calculated carbon aromaticity index
10. The ..... the CCAI, the later the ignition takes place.
   a. higher b. lower c. clearer
11. The ……. pump increases the pressure of the fuel just before it is delivered to the engine.
   a. transfer b. booster c. circulating
12. The heating value of a fuel is commonly expressed in …… .
   a. r.p.m b. b.t.u c. p.p.m
13. Thick particles sink down in the …… .
   a. service tank b. settling tank c. buffer tank
14. Most fuel injectors are operated …… .
   a. hydraulically b. mechanically c. manually
15. The needle stem and its return spring of fuel injector are fitted in …… .
   a. the nozzle assembly b. the injector holder c. the tapered pressure seat

E. Put the following vocabulary under the correct heading.

service tank	distillate	atomizer	carbon content	balancing tank
pressure chamber	CCAI	purifier	viscosity	3-way valve
specific gravity	residual	nozzle	ash content	viscosity regulator
	needle	filter	pressure retaining valve	

Fuels & their properties	***Fuel oil system***	***Fuel injector***

F. Read the following information on the fuel oil system and fill in the gaps with the words in the box.

filtered	gravity	capacity	lower	drained off	draws	checks

1. In the settling tanks the fuel is constantly heated to ……..…….. the viscosity-grade and thus quicken the separation of fuel from water and impurities.
2. Before the fuel is passed to the Daily Service Tanks, the water and impurities are …… ..... from the settling tank, after which the process of preheating and separation is

continued by a heater, a purifier and often a clarifier. (The purifier separates water and impurities from the fuel; the clarifier separates impurities from the fuel).

3. In most fuel systems the settling tanks and daily service tanks are also called …….. ..... tanks.
4. Usually two daily service tanks are installed, so that one tank can be filled while the other is being used. Each tank has the ……. to provide the engine with fuel for 24 hours.
5. The low-pressure fuel pump (or "booster pump") …….. the HFO from the daily service tank and passes it to the high-pressure fuel pumps in the engine.
6. Between the booster pump and the high-pressure fuel pumps the fuel is first preheated and …… by a strainer.
7. A viscosity controller, or viscosity regulator, …….. the viscosity of the fuel. When the viscosity is too high, the fuel will have to be heated, so that it will become thinner and thus suitable to be injected into the engine.

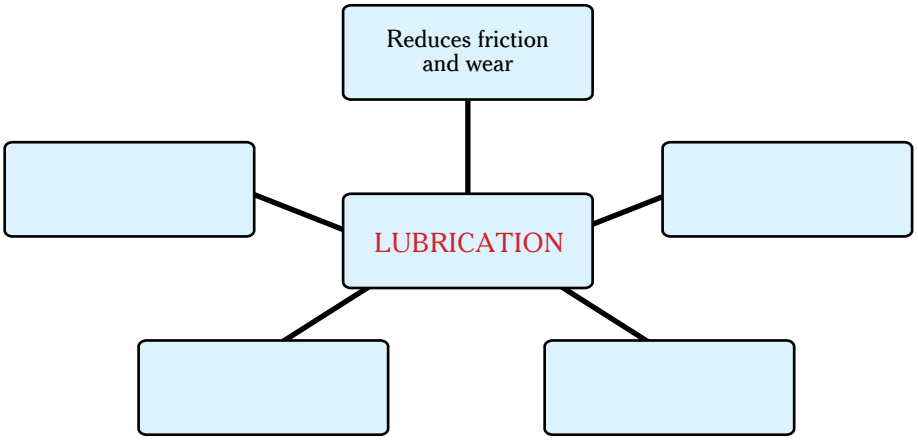
2. Lubrication

I. Lubricating Oils

Lead-in: Discuss the following questions in class.

- What does lubrication do?
- Why is it important?
- What lubricating oils ("lube oils") are used in diesel engines?

A. Listen to a lecture on the objectives of lubrication and insert these objectives (the points made by the speaker) in the cycle below.



B. Now read the lecture and find in it the words which have the following meaning (they are marked in italics for help).

1. improve, intensify, magnify: .....
2. sticking property, adhesion: .....
3. fighting dirt: .....

4. not enough, insufficient: .....
5. duty, function: .....
6. rubbing between two metal surfaces: .....
7. takes in, sucks up: .....
8. mechanical wear due to acids, rust: .....
9. major damage of bearings due to insufficient lubricating: .....
10. strengthened, reinforced: .....

The main *task* of lubrication is to reduce *friction* between the moving parts of an engine. In this way we ensure better performance of the engine and reduction of wear due to friction. Lubrication also acts as a cooling means of the metal surfaces because it *absorbs* a considerable amount of heat which is released from friction.

Furthermore, it assists the piston rings in sealing the combustion chamber.

Moreover, it protects the surfaces from *corrosion*, even when the engine is out of running, thanks to the good *tenacity* lubricants have on metals.

Finally, it keeps the metal surfaces clean due to the *antifouling* property of lubricating oil.

Correct lubrication of the engine is of great importance because *inadequate* lubrication would lead to the *seizing* of bearings and sticking of the engine.

The correct choice of lubricating oil is essential too and we should always consult the engine constructor's manual as to the recommended type of oil for the particular engine.

The types of lubricating oils used in marine diesel engines are generally mineral oils, coming from the residues (base stock) of crude oil after its distillation. These mineral oils are *fortified* with chemicals (additives) which *enhance* their functional properties that the engine requires.

C. Read the following passage on the properties of lube oils and underline the correct alternative.

The properties of lubricating oils are ***similar to / different from*** those of fuel oils. Viscosity is the ***least / most*** important property of lube oils. The Society of Automotive ***Engines / Engineers*** SAE has ***classified / divided*** oil viscosity from SAE 10 to SAE 250.
SAE 10 to SAE 20 oils are very ***thin / thick*** and are suitable for ***low / high*** temperatures.
SAE 30 to SAE 50 oils having a medium to high viscosity are ***unsuitable / suitable*** for Diesel Engines. The viscosity index, VI, of the oil is of equal importance because it indicates how stable the oil is to variations of temperature. Chemical stability is an important specification of lube oil too.
The ***acid / base*** neutralizing capacity of oil is ***represented / replaced*** by its total base num-

ber (TNB) value, which indicates the oils ***acid / alkaline*** reserve. The ***higher / lower*** the TNB is, the more acid neutralizing capacity the oil has.

D. The following is a list of additives which are added to lubricating oils to enhance their functional properties. Match them to the reasons for their use below.

dispersants / detergents / corrosion inhibitors / wear preventers / antioxidants pour point depressants / VI improvers / anti-foamants

Additive	***Reason for use***
	Keep the engine parts clean of deposits, especially carbon deposits
	Prevent the corrosion of metal surfaces by forming a tenacious oil film on them
	Prevent the oxidation of oil which destroys its lubricating properties
	Lower the freezing point of oil thus having free flow at lower temperatures
	Keep sludge, carbon and other deposits suspended in the oil
	Reduce foam in the crankcase
	Limit the wear due to friction
	Increase the VI of the oil

E. What do the following terms mean? Underline the most appropriate meaning according to how they are used in the previous exercises to describe the lube oil additives.

1. to fortify ⇨ support, strengthen, encourage
2. to enhance ⇨ intensify, multiply, expand
3. to neutralize ⇨ defuse, eliminate, exclude
4. to inhibit ⇨ restrain, stop, hold back
5. tenacious ⇨ strong, clinging tightly, firm
6. to disperse ⇨ dissipate, scatter, dissolve
7. inadequate ⇨ insufficient, inefficient, enough
8. to suspend ⇨ hang up, lay off, float around
9. to depress ⇨ reduce, cause melancholy, cause economical crisis
10. antifoamant ⇨ chemical which prevents the formation of bubbles, froth, lather

F. Match the words to form correct collocations.

1. Flash	improver
2. Corrosion	preventers
3. Pour point	inhibitor
4. Pour	tank
5. Water and	point
6. Wear	sediment
7. Sump	depressants
8. VI	point

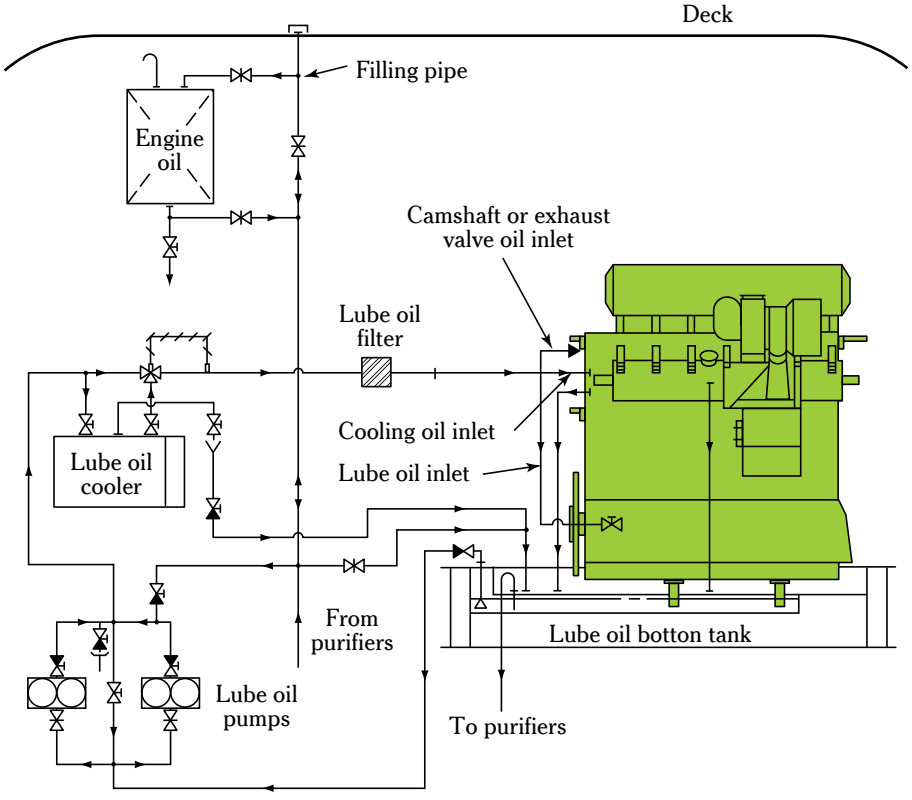
G. State the lubricant additive which would help with the problem.

Problem	*Appropriate additive(s)*
• major accumulation of deposits on piston crown and cylinder liner	
• difficulty in pumping the lube oil at low temperatures	
• scored, scratched cylinder liner surface	
• fouled surfaces	
• signs of corrosion on metal surfaces	

II. Lubrication of Diesel Engine / Lubricating Oil System

Lead-in:

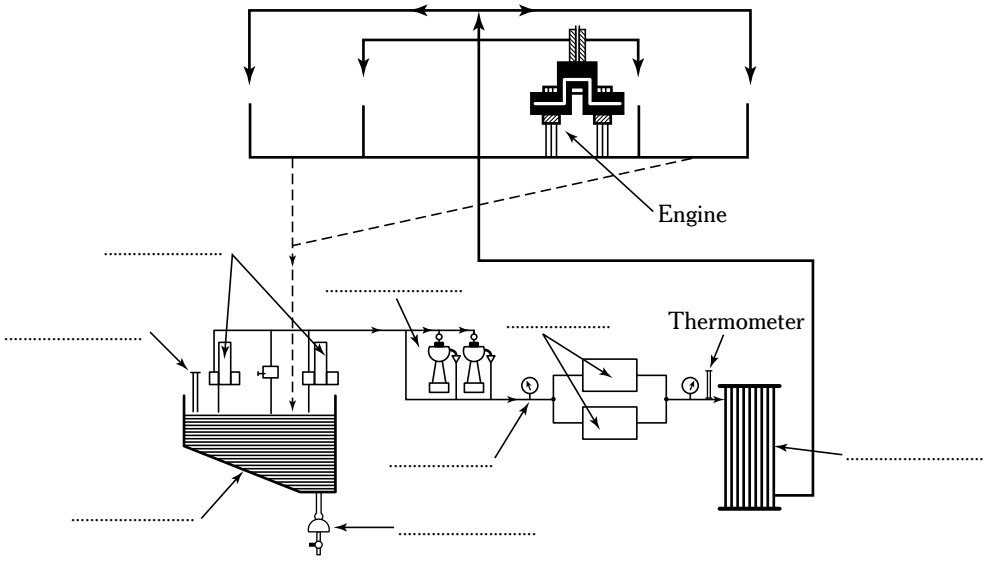
1. Is a lubricating oil system similar to a fuel oil system?
2. Look at the diagram of a lube oil system below. Identify the parts it consists of and answer the following questions.
   i. Where is lube oil pumped from and what does it pass through before being discharged to the engine?
   ii. Where does it drain after use?



Uni-lube oil system, without booster pumps

A. Look at the following simplified lube oil diagram of a 4-stroke Diesel Engine. Fill in the missing terms using the parts of the system given in the box below, and study how it works.

pumps	oil drain tank (or sump tank)	cooler	pressure indicators	filters
purifier	drain cock	sounding or venting pipe		



B. The following sentences describe the system and the circulation of lube oil. Put them in the correct order using the table below. The first two are provided.

1. The oil is drawn from the sump tank by pressure pumps.
2. A parallel line distributes the oil to the cylinder for lubrication and cooling of the pistons. From there the used oil drains in the tank.
3. The oil is supplied to the engine at a pressure of about 4 bars.
4. It passes through a centrifugal separator, fine filters and a cooler before entering the engine.
5. It lubricates the main crankshaft bearing first.
6. Finally it is led up through the connecting rod to the gudgeon pin before returning to the crankcase.
7. Drillings in the crankshaft, then, take the oil to the crankpin or bottom end bearings.
8. In the sump tank there is a sounding pipe which serves as a vent too. There is also a drain cock for the removal of water and dirt.

Correct order:

1	8						

C. Read the text below and identify which subsystems are shown in the figures that follow.

The lubricating-oil system of marine diesel engines is a bit complicated because different types of lube oils are required for different parts of the engine. A lubricating oil system of a slow speed 2-stroke Diesel engine, for example, may include three types of lube oil for the main engine.

That is, one for the circulating lube oil for the main engine, one for the cylinder oil and one for the turbocharger.
Thus a complete lube oil system may comprise the following subsystems:

- Lubrication of main engine with circulating lube oil. This type of oil lubricates the bearings, pins, valves, camshaft, rocker arm, crosshead, and guides.
- Lubricating of main engine with cylinder oil. This one lubricates the piston, piston rings and cylinder liner.
- Lubrication of turbocharger with turbine oil. Nowadays however, the turbocharger is lubricated with the circulating lube oil.

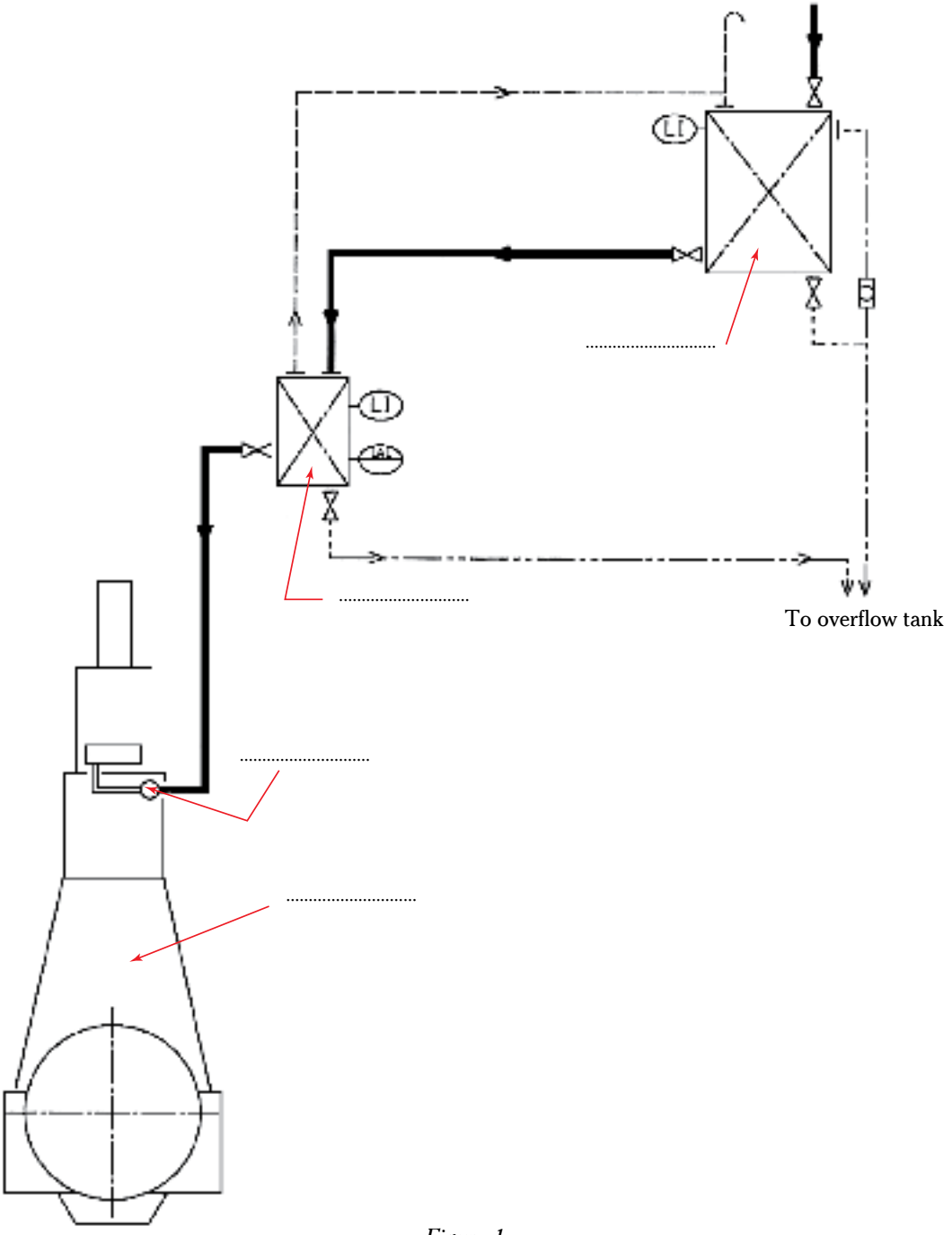


Figure 1

Figure 2

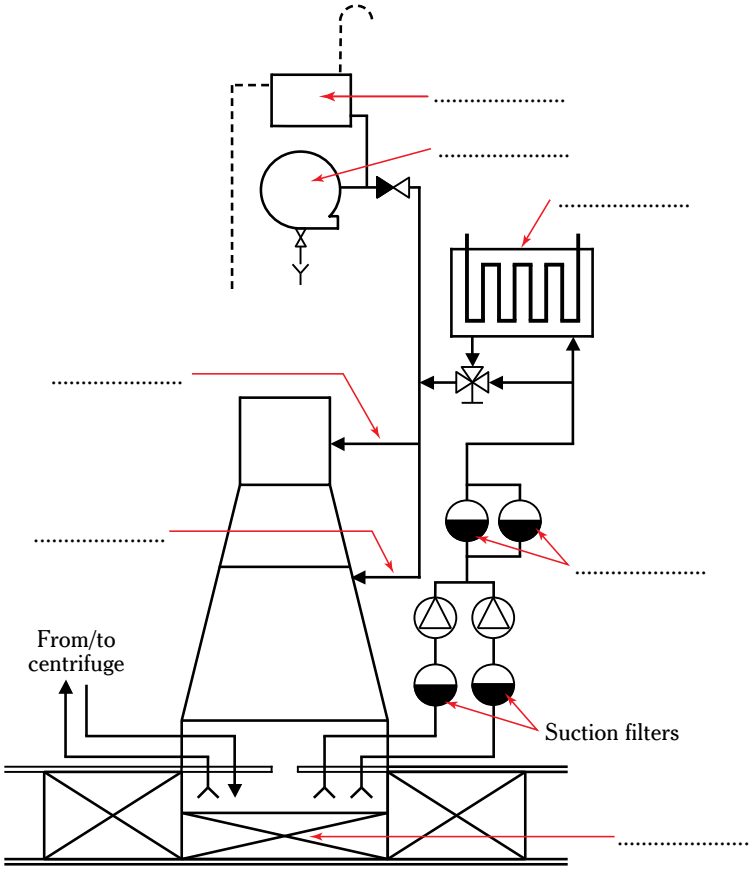
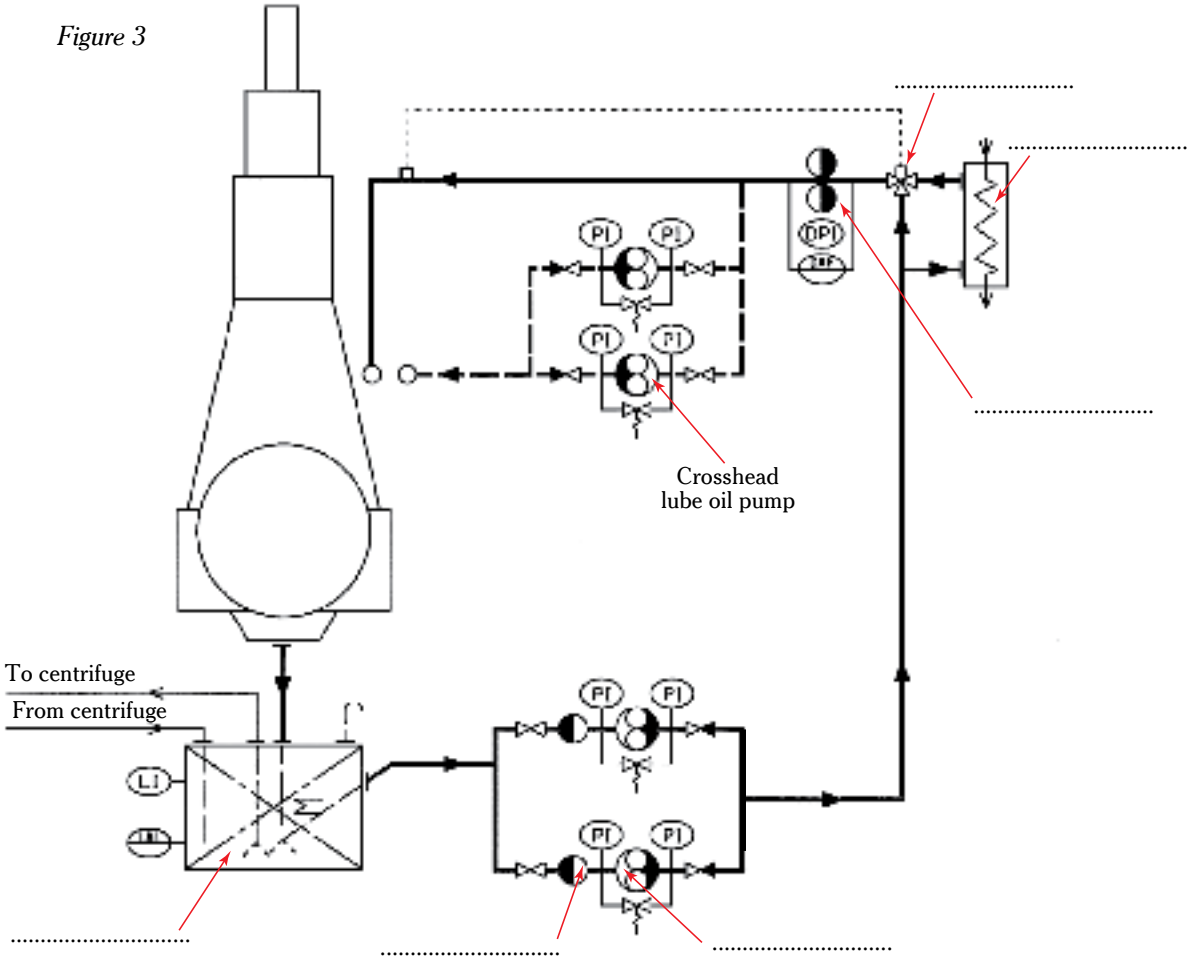


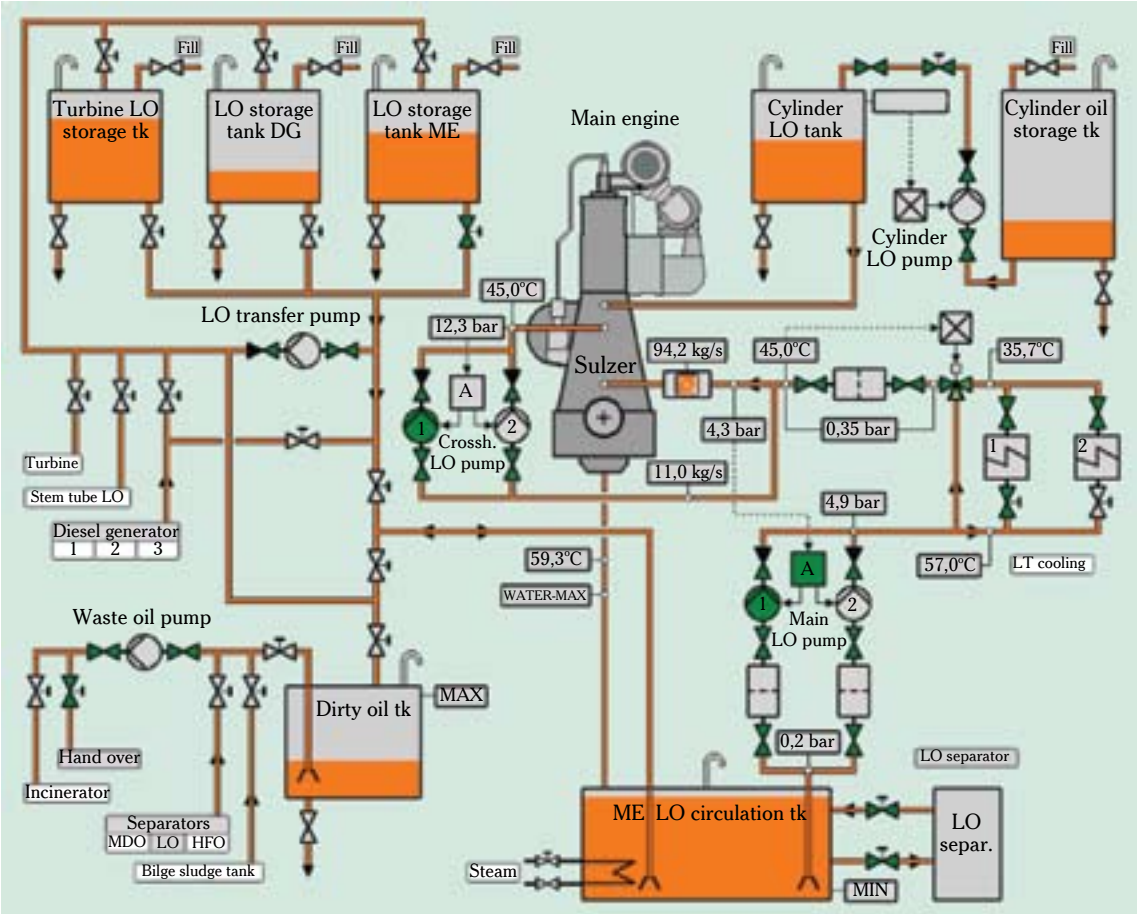
Figure 3



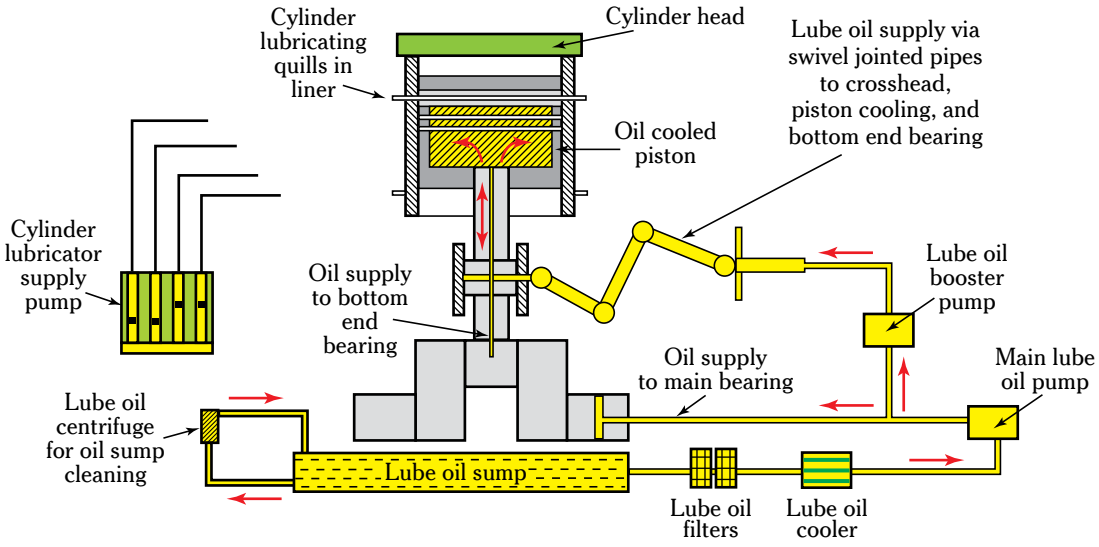
D. Write the correct legend under each subsystem. Then, use the words below to show the parts and also where certain lines lead in each subsystem. Some are given for help.

ME and turbocharger lubrication with circulating oil	***Cylinder lubrication with cylinder oil***	***ME lubrication with circulating oil***
• ~~From/to centrifuge~~ • Drain tank • To bearings • To governor • Discharge filters • ~~Suction filters~~ • Circulating lube oil pumps • Cooler • Turbocharger • Gravity tank	• Cylinder-oil daily service tank • Cylinder-oil storage tank • ~~To overflow tank~~ • Lube oil inlet to lubricators • Main Engine	• Drain tank • Suction filter • ~~Crosshead lube oil pump~~ • Temperature control valve • Cooler • Lube oil pumps • Lube oil discharge filters

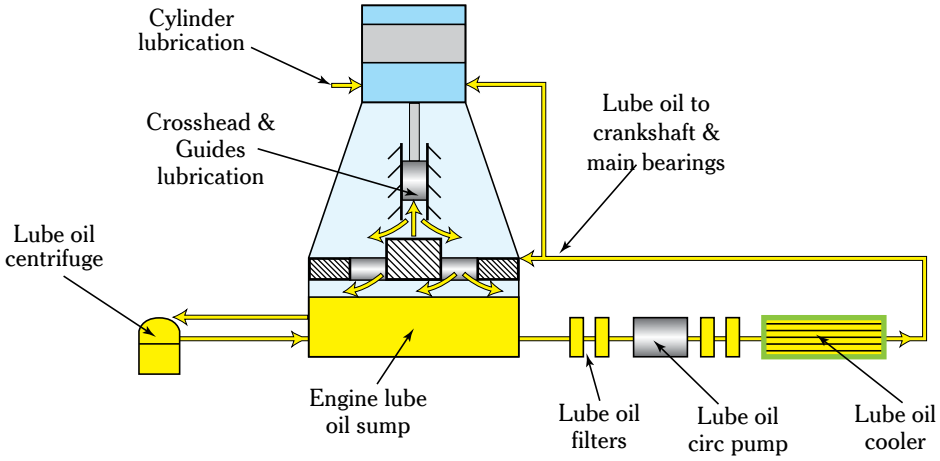
E. Look at a Marine Diesel ME lube oil system and work with your partner to identify the subsystems it comprises.



Lube oil system



Typical lube oil flow diagram for a two-stroke marine engine



Marine diesel main engine lube oil system

F. Choose one of the following subsystems and describe how it works.

1. Lubrication of the main engine with circulating lube oil.
2. Lubrication of the main engine with cylinder oil.
3. Lubrication of turbocharger and diesel generators.
4. Disposal of dirty oil from the dirty oil tank.

G. Now read the passage which describes the diagram of the lube oil system and fill in the missing terms.

bearings / pressure / exhaust / twelve / particles /
pumps / drains / piston / autoclean / cooler / separator

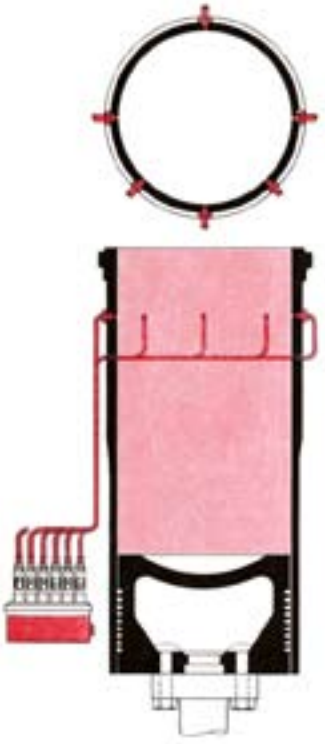
In the first system the oil is taken from the ME LO circulating tank through filters by screw type (1) ..... . It passes through a (2) ..... and a(n) (3) ..... filter and ends in the main engine at a pressure of about four bars. It lubricates the main crankshaft (4) ....., the crankshaft

and camshaft drive. A separate supply is led to the crosshead by high (5) ..... pumps at a pressure of about (6) ..... bars. It lubricates the crosshead and the guides. Some of the oil travels back through the piston rod and cools the (7) .... The rest is led down a drilling in the connecting rod and lubricates the bottom end bearings. This oil is also used to operate the hydraulic (8) ..... valve and the hydraulic reversing gear of the engine. The used oil (9) ..... into the circulating tank or sump tank. The oil in the circulating tank is constantly centrifuged through a (10) ..... to remove any water and foreign (11) .... which may be in it.
The lubrication of the turbocharger and the diesel generators of the engine in the diagram is connected to the circulation system of the main engine, thus using the same type of oil. In some cases, however, the turbocharger has its own lubricating system where a special turbine oil is used.

H. The following text refers to cylinder lubrication. Read it and underline the correct alternative. The previous diagrams and the picture below will help you.

The lubrication of the cylinder is very important too, first because it forms an oil film between piston rings and cylinder liner, thus reducing friction, and secondly because it ***neutralizes / enhances*** the acid products of combustion and ***increases / reduces*** cylinder wear considerably.

The cylinder oil has ***high / low*** viscosity and a ***high / low*** TBN value. It is drawn from the cylinder oil ***sump / storage*** tank to a ***small / big*** service tank by separate pumps. From there, the oil is supplied to lubricators by gravity and is led through drillings (quills) onto the liner surface where grooves ***distribute / attribute*** it circumferentially around the liner, and the piston ***rings / rod*** spread it up and down the surface of the liner. There is not return of the used oil because it is finally burnt with the fuel.



Cylinder Lubrication

Vocabulary consolidation

I. Underline the correct word or phrase.

1. Detergents are ..... additives in the lubricating oils.
   a) cleaning b) antifoaming c) antioxidizing
2. In order to have free flow of the lubricating oil at low temperatures we add ..... .
   a) pour point dispersants b) flash point depressants c) pour point depressants

3. We use ..... to keep impurities suspended in the lube oil.
   a) depressants b) dispersants c) detergents
4. The TBN value of the lube oil shows the ability of the lube oil to ……..... the acid influence.
   a) enhance b) sustain c) neutralize
5. Lube oils with a viscosity around SAE 15 are ….....…. for diesel engines.
   a) suitable b) unsuitable c) proper
6. To prevent corrosion of metal surfaces we can improve the anticorrosive property of lube oil by adding corrosion ..... .
   a) improvers b) inhibitors c) preventers
7. The crosshead and the guides are lubricated by ..... .
   a) cylinder lube oil b) circulating lube oil c) turbine oil
8. The cylinder lube oil has .....…. the circulating lube oil.
   a) higher viscosity than b) lower viscosity than c) the same viscosity as
9. The cylinder oil service tank is …..... the cylinder oil storage tank.
   a) the same as b) bigger than c) smaller than
10. The lubrication of the cylinder liner is done ..... .
    a) vertically b) horizontally c) circumferentially

J. Fill in the gaps with an appropriate derivative.

1. Empty the ……. ***(contain)*** of this box on the floor.
2. …… ***(add)*** in the lubricating oil improve its quality.
3. The TBN value of a lube oil eliminates the ……. ***(corrode)*** influence of acid.
4. Antioxidant additives in the lube oil prevent its …… . ***(oxidize)***
5. The …….. ***(remove)*** of water and foreign particles in the lube oil is done in a centrifugal …….. . ***(separate)***.

K. What is shown in each picture? What happens in each of the devices shown? How?

3. Maintenance of Diesel Engines (I)

I. Maintenance Work

Lead-in: REPAIR – MAINTAIN – OVERHAUL

- ⇨ to ***repair*** is to fix, to restore a damaged part of the engine (in many cases this can be done while the ship is at sea)
- ⇨ to ***maintain*** is to service a machine or parts and by all means keep it/them in good condition, thus minimizing damage and breakdown (part of it can be done at sea as well)
- ⇨ to ***overhaul*** is to dismantle the parts of a machine, examine them and repair or replace the damaged or defective ones (this must be done when the ship is docked)

Detailed instructions on ***how to operate and maintain*** an engine are given by the ***engine constructor*** to ensure the efficient operation of the machinery. If these instructions are followed, the maintenance can be carried out regularly and properly, so ***breakdowns*** are minimized. The instructions are supplied in ***manuals*** and kept by the Chief Engineer, but they are at the disposal of all engine room members.

A. The following pictures show some damage you have to deal with during overhauling or maintenance. Identify the damage and write an appropriate caption under each picture (choose from the list below).

- Accumulated deposits on exhaust valve after 10,000 hours of running on heavy fuel oil
- Major wear and deformation of a 4-stroke D.E. piston crown
- Piston crown with accumulated carbon deposits

1. ....

2. ....

3. ....

B. What possible reasons caused this damage? Match the types of damage in the previous exercise with the most probable reason in the list below.

high thermal stresses	HFO with high carbon content	residues from the combustion of fuel oil

C. Here are some more problems of the engine components. Discuss possible reasons for these. Write them down next to each problem. Some hints are given in the brackets.

Problems	***Possible reasons***
1. Cracks on piston or cylinder head underside	
2. Crankshaft deflection	
3. Sticking of piston rings in their grooves	
4. Scale on cylinder head and externally on cylinder liner	
5. Scratches and abrasion on cylinder liner surface	
6. Scuffed cylinder liner	

Hints
[abrasive particles, e.g. ash in fuel, iron chips in lubricant]
[vibration, main bearing wear down, slackened tie bolts and chocks]
[inadequate lubrication causing major friction]
[deposits of salts from cooling water]
[thermal stresses, variations in temperature]
[accumulation of deposits, excessive lubrication]

D. Fill in the Glossary with the words in the box.

defective	abrasion	at one's disposal	scale	dismantle
accumulate	deformation	alignment	chips	groove

Glossary

1. ..... build up, pile up
2. ..... out of shape distortion
3. ..... disassemble, disconnect, remove
4. ..... faulty, damaged
5. ..... available to use
6. ..... bringing back to a straight line
7. ..... deposits of salts suspending in water
8. ..... channel
9. ..... wound on a metal surface caused by hard particles, e.g. sand, iron chips, etc.
10. (iron) ..... very tiny iron particles

E. What maintenance work did you experience during your first training voyage?

Useful vocabulary:
dismantle, disassemble, fit, adjust, machine, grind, lap, scrape, recondition, clearances, weld, etc.

F. Listen to a Chief Engineer who informs the shipowner about overhauling the engine of a newly-purchased ship.

i. Tick only the components you can hear in the list below.
ii. Listen to the dialogue again and add beside each engine part what work was done to it.

	Fuel pumps
	Leaking pipes
	Cylinders
✓	Piston rings → replacement
	Cylinder liner
	Connecting rod top and bottom end bearings
	Main bearings
	Winches
	Crankcase

	Crankshaft
	Camshaft
	Cylinder head
	Valve seats
	Bilge pump
	Steering gear
	Atomizers, filters
	Stuffing box

G. Read the following text about engine maintenance and fill in the gaps with the words in the box.

instructions	scale	corrosion	readjusted	cracking	cloths
dismantling	carbon	deflection	clearances	grade	spare

The engine should be overhauled and cleaned at regular intervals. A guide as to the frequency of overhauls is always given by the engine constructor but the load the engine is run on and the (1) ..... of fuel and lubricating oil play an important role too.
Before starting any overhaul job, it is advisable to have the required tools, the (2) ..... manual and some (3)..... parts ready.
Any (4) .....work should be carried out with the greatest care. Lubricating openings should be sealed off and cleaning should be done with cleaning (5) .... (not cotton waste).
Here are some maintenance works during overhauling:

- The cylinder head should be checked at the combustion side for cracks or burning damage and for (6) ..... at the water spaces. The contact faces should also be inspected and soft iron joints should be replaced.
- The piston and especially the piston crown is exposed to high thermal stresses which eventually may cause (7) ..... . Piston rings should be checked for (8) ..... deposits in their grooves and for proper (9) .... in order to avoid excessive wear sticking and breakage.

- The scavenge and exhaust ports on the cylinder liner should be cleaned of residues and combustion products and the cylinder liner should be gauged for wear. The most common reason for cylinder liner wear is (10) ..... caused by the presence of sulphur in the fuel.
- The fuel injectors should be cleaned and their drilling should be checked for wear. Their injection pressure should be (11) ....., if necessary.
- Worn main bearing and vibrating forces are the main reasons for crankshaft (12) .... The shaft should be aligned and its tie bolts should be retightened. Having proper clearances for all bearings is very important too.

H. What maintenance work should be done to the following engine parts? Discuss with your partner and choose an appropriate answer.

1. scored valve seats →.....
2. seized piston →.....
3. fuel cam nuts → .....
4. stuffing box →.....
5. noisy crosshead guides and slippers →.....
6. sump tank →.....
7. connecting rod screws →.....
8. inlet and outlet valve contact surface between the valve and the valve seat insert → ... .
9. camshaft drive – too large gear backlashes →.....
10. governor → .....

should be retightened	should be lapped with carborundum paste and reground	the guides should be aligned and the ply of slippers should be readjusted	check for actual contact surface, recondition	cleaned and its sealing elements (flange, gasket, packing) should be replaced
should be cleaned of sediment	check the level and condition of oil	check for correct tightness, retighten them	replacement	replacement

I. Match the words in the box to the appropriate definition.

to lap	carbon deposits	to recondition	clearance	sediment	to seal
to grind	carborundum paste	soft iron joints	deflection	scored	a ply

1. .....: to rub and smoothen a surface with a grinder
2. .....: to cover with, to put on top of a surface
3. .....: slight distance between two surfaces
4. .....: remains, residues of unburned carbon and other substances
5. .....: to service, to overhaul, to bring in its/the former condition
6. .....: coarse paste-like material for filling in scratches
7. .....: to close tightly
8. .....: a travel
9. .....: deviation from normal

10. .....: coagulation of suspending substances, deposit
11. .....: pitted, with deep scratches
12. .....: sealing elements of soft iron

J. Tick the proper maintenance work for each defect.

	Maintenance Work								
Defects	SCRAPING	RECONDITIONING	MACHINING	RETIGHTENING	GRINDING		ALIGNING	READJUSTMENT	CLEANING	REPLACEMENT
					LAPPING	REGRINDING				
Incorrect clearances										
Carbon deposits										
Worn surfaces										
Scale – sludge										
Deflection										
Surfaces out of roundness										
Scored – scratched surfaces										
Slack tie bolts or screwed connections										
Incorrect injection pressure										
Wear down failure										
Cracks, fractures										

K. Circle the odd word out.

1. disconnect, disassemble, restore, remove, dismantle
2. deposits, residues, incrustations, remains, score, scale, sediment
3. crack, crank, fracture, break, smash
4. flange, washer, joint, sailing, gasket
5. plug, seal, cork, jam, clog, tap

II. Maintenance and Safety

A. Read the text about an accident in the engine room. How could appropriate maintenance have prevented it? Choose the correct alternative of the words in bold.

ENGINE-ROOM FIRE[2]

What happened?

A fire in the diesel generator room damaged the electrical control cables and resulted in the ***loss / pause*** of electrical power and main propulsion. The emergency generator started automatically. A watchkeeper ***achieved / attempted*** to extinguish the fire with a hand-held dry powder extinguisher, but was driven back by dense black smoke. The fire was eventually extinguished by a fire-fighting party wearing firemen's suits and ***breathing / face*** apparatus. When the fire had been extinguished, propulsion power was re-established from one of the vessel's four main engines which also provided electrical power from one of two shaft-driven generators. Temporary repairs to the cabling in the generator room permitted the start-up of one diesel generator.

Why did it happen?

The fire was believed to have started by the escape of hot exhaust gases from an air start valve on one of the generators, since the rocker cover was found lifted off its seat and the air start valve was found to have a broken stud and the securing flange had lifted about 10mm. It was suggested that the hot gases ***ignited / put out*** vaporized lubricating oil inside the cover sufficient to lift the cover, from where the fire spread to the deckhead located about 1.5 m above. An ignition test of the deckhead insulation caused it to burn and emit black smoke. This could possibly have been due to the ***absorption / mixture*** of oil vapour over a period of time since the deckhead surface was irregular and may have presented cleaning difficulties.

What can we learn?

1. When removing cylinder head valves for maintenance, the opportunity should be taken to examine fasteners for signs of fatigue. Fasteners should be tightened to the torque specified by the ***creator / manufacturer*** – at the same time checking that nuts run freely on their threads.
2. Deckheads – especially those in low-headroom machinery spaces – should be examined periodically for ***accumulation / assembly*** of combustible deposits and cleaned appropriately.

⇨ *deckhead*: the undersurface of a deck
(it refers to the bottom of the deck above you, the "ceiling", and the frames supporting it)

B. Read the following "Warning" text and complete the unfinished sentences. Use the phrases below.

1. ...of springs
2. ...pierce the skin
3. ...oil to run down onto the piston crown
4. ...of hot liquids or gases

2. IMO Lessons Learned for Presentation to Seafarers, No 17 in 17th session.

General: Correct operation and maintenance are crucial points for obtaining optimum safety in the engine room. The general measures mentioned here should therefore be routine practice for the entire engine room staff.

Special Dangers

WARNING!

- Keep clear of space below crane with load.
- The opening of cocks may cause discharge ....
- Think out beforehand which way liquids, gases or flames will move, and keep clear.
- The dismantling of parts may cause the release ....
- The removal of fuel valves (or other valves in the cylinder cover) may cause ..... . If the piston is hot, an explosion might blow out the valve.
- When testing fuel valves, do not touch the spray holes as the jets may ....
- Do not stand near crankcase doors or relief valves – nor in corridors near doors to the engine room casing when alarms for oil mist, high lube oil temperature, no piston cooling oil flow, or scavenge box fire are registered.

C. The following words come from the text above. Underline the best definition.

1. *keep clear of*
   a) stay near to b) stay away from c) stay across
2. *discharge of liquids*
   a) flush of liquids b) delivery of liquids c) flow of liquids
3. *beforehand*
   a) in advance b) handy c) having in hand
4. *to release*
   a) to loosen b) to set free c) to relieve
5. *to pierce*
   a) to burn b) to penetrate c) to wound
6. *oil mist*
   a) a cloud of oil vapours b) a haze c) a thick oil cloud
7. *an alarm is registered*
   a) it is logged b) it is noticed c) it is sounded

D. Read the following safety precautions during maintenance. Fill in the parts that are missing from the text using the sentences in the box below.

SAFETY PRECAUTIONS

LIGHTING

Ample working light should be permanently installed at appropriate places in the engine room, and portable working light should be obtainable everywhere. Special lamps should be available (1).....

CHECK AND MAINTAIN

Measuring equipment, filter elements, and lubricating oil condition.

TURNING GEAR

Before engaging the turning gear, (2)..... and that the indicator cocks are open. When the turning gear is engaged, check that the indicator lamp "Turning gear in" has switched on. Check turning gear starting blocking once every year.

LOW TEMPERATURES – FREEZING

If there is risk of freezing, then (3)....., or the cooling water treated to avoid freezing.

ENTERING THE CRANKCASE OR CYLINDER

Always ensure that the turning gear is engaged; even at the quay, (4).....
Check beforehand that the starting air supply to the engine and the starting air distributor, is shut off. In case of oil mist alarm, precautions must be taken before opening the crankcase.

SLOW-TURNING

If the engine has been stopped for more than 30 minutes, (5)....., just before starting in order to safeguard free rotation of the engine.

Before maintenance work is carried out, (6)..... according to the safety precautions given on the specific Data Sheet.

SAFETY PRECAUTIONS

☒ Stopped engine
☒ Shut off starting air supply
☒ Block the main starting valve
☒ Shut off starting air distributor
☒ Shut off safety air supply
☒ Shut off control air supply
☒ Shut off air supply to exhaust valve
☒ Engage turning gear
☒ Shut off cooling water
☒ Shut off fuel oil
☒ Stop lubricating oil supply
☒ Lock the turbocharger rotors

A. all engines, pumps, coolers, and pipe systems should be emptied of cooling water	B. the engine must be stopped and blocked	C. for insertion through the scavenge ports
D. check that the starting air supply is shut off	E. slow-turning should always be effected	F. the wake from other ships may turn the propeller and thus the engine

Vocabulary Consolidation

E. Useful vocabulary: Fill in the missing derivatives in the tables below.

Verb	*Noun*	*Adjective*
accumulate	.....	accumulated
.....	corrosion	corroded / corrosive
.....	lubrication / lubricant	lubricating
abrade	.....	abrasive / abraded
align	.....	aligned
.....	absorption	absorbent

Noun	*Adjective*
defect	.....
.....	worn
.....	viscous
.....	impure
combustion	.....
.....	dense
residue	.....

Verb	*Noun*
vibrate	.....
.....	consumption
verify	.....
treat	.....
.....	distillation
.....	resistance
.....	circulation
replace	.....
adjust	.....
.....	ignition

4. Safety in the Engine Room

I. Housekeeping guidelines

a) Read the following safety instructions and fill in the missing words.

unmanned dispose calibrate buckets
tripping rotating incinerating

Housekeeping and safety in engine room – Guidelines for ships[3]

Summarized below are some basic safety precautions for working on board machinery spaces.

Oily contaminated materials

Place all oil contaminated rags and other material in metal containers and (1)……. ashore when required (no dumping or (2)…….).

Bilges

Repair all pipe or pump leakages as soon as possible to limit the amount of bilge water that is in need of separation and eventually discharge overboard.

Engine Room Workshop

Keep the engine room tidy to allow hot work when required. No storage of flammable material is permitted. Keep the personal protective equipment (PPE) prepared in place.

Pay special attention to the following in the engine room:

- Keep floor plates and ladders free from oil or grease and properly fixed to avoid (3)..... .....;
- Keep the E/R properly illuminated at all times;
- Properly insulate exhaust manifolds on engines;
- Make sure there are no leakages in exhaust manifolds and ducts through the entire casing;
- When engine room is (4)....., lock external entrances to the engine room except designated entrances;
- Properly lag steam pipes and other hot surfaces;
- Do not leave flammable material in (5)…… or open containers;
- Test bunker tank high level alarm before each bunkering operation and at least monthly;
- Contain leakages of fuel and lube oil as soon as possible;
- Test and (6)…… thermometers and pressure gauges on a sequential basis, allowing all to be tested annually;
- The operation of the bilge water separator shall be strictly supervised by the Chief Engineer;
- If any part of the fire detection system is temporarily disengaged due to any repair, e.g. hot work in the area, mention this clearly on the work permit;
- Keep all (7)…… parts protected;
- Smoking is not allowed in the engine room;
- Use the incinerator as per manufacturer guidelines;
- Carry out Monthly Safety Inspections.

Glossary

to lag	to cover pipes, etc. with a special material to save heat, or to stop the water in them from freezing, to insulate
sequential	following in order of time or place, following in a logical order or sequence

3. From www.shipbusiness.com, abridged.

b) Look at the pictures on the next page and write appropriate instructions related to safety in the engine room, which you read in the guidelines above. They can be related to the following.

oily rags / flammable materials / floor plates / pipes or exhausts / illumination / steam pipes & hot surfaces / rotating parts / tidiness / etc.

.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

c) Check whether proper housekeeping tips are put into practice in the engine room. Match the verbs to the phrases in the box. Then ask your partner: "Have you.....?"

e.g.: *Have you insulated exhaust manifolds on engines?*

1. Carry out	no smoking signs
2. Display	the space from grease
3. Lock	all external entrances
4. Insulate … exhaust manifolds on engines	the monthly inspection
5. Fix	~~exhaust manifolds on engines~~
6. Clean	all floor plates and ladders
7. Place	the rags in containers

II. Instructions to the Engineer of the Watch

a) Read the following* Instructions to the Engineer of the Watch (while in port)[4] *and fill in the missing parts of the sentences.

in doubt	from the engine room	abnormal conditions of the machinery
fuel oils, lub oils	on stand-by	affect navigation

Never be absent (1) ……. during your watch.
Make frequent inspection rounds in E/R to prevent accidents. Pay attention to (2) …….. that are difficult to detect from the E/R control room, such as leaks, sound, vibrations, heating and smells.

4. From www.shipbusiness.com, abridged.


OILY
RAGS

Appraise the present quantities of (3)……...……. and feed water.
Notify the Officer of the Watch when a failure of machinery has occurred which may (4) ……..…… .
Take proper measures immediately and report to the Chief Engineer without delay in the following cases: • When you are informed from the bridge of the schedule (Time) of the Engine to be placed (5) ……. or to be used. • When you have found abnormal conditions of machinery or you are (6) ……... . • When you have received emergency orders or instructions.

b) Match the words to form correct collocations.

1. inspection	orders
2. receive	round
3. abnormal	water
4. to be	conditions
5. failure	in doubt
6. feed	of machinery
7. control	attention
8. pay	room

c) Match the definitions below to the appropriate words in bold in the text.

A personal injury with face and neck burns caused by auxiliary boiler explosion
(IMO FSI19, No7)

What happened?

While exchanging the auxiliary boiler burner on board an about 39,000 gt bulk carrier at anchor, there was a ***flash-back*** from the boiler furnace. Flames ***engulfed*** the ship's engineer, burning his face and neck. The burner was being replaced to ***rectify*** misfires.

Why did it happen?

The ship's engineer was not aware of all the hazards associated with maintenance of the boiler burner, i.e. accumulated fuel oil at the furnace bottom resulting from burner misfiring, while disconnecting the fuel line from the burner.

The boiler furnace was not sufficiently ***purged*** to remove the ***residual*** heat in order to avoid ignition of any flammable mixtures.

The ship's crew was not aware of previous flashbacks involving similar burners, and the company had not ensured that such safety information was ***disseminated*** to the ship's crew.

Glossary

.....	put right, correct, something that is wrong
.....	explosion
.....	remaining at the end of a process
.....	spread (to spread information, knowledge, etc. so that it reaches many people)
.....	surrounded or covered completely
.....	cleaned (made clean by getting rid of unwanted material)

d) Class Project.

Look at an Investigation Report on flashbacks that caused injuries to Engineers and present to class. [www.atsv.gov.au Marine Occurrence Investigation No 238 by Australian Transport Safety Bureau] What safety actions were taken?

APPENDIX II
Pair-work: Student B material

Unit 2

Exercise C (page 18).

#1. Name:	
MMSI:	
Call Sign:	
#2. Name:	
MMSI:	
Call Sign:	
#3. Name:	
MMSI:	
Call Sign:	
#4. Name:	
MMSI:	
Call Sign:	

Exercise B (page 32).

	A	B	C
Date:	23/08/2009	06/01/2010	15/02/2010
ETA:	0600	2055	1200
Loading starts:	0640	2145	1300
Cargo:	70,000 mt of grain	80,000 mt fuel oil	2,300 motor vehicles
Officer in charge:	C/O DELLIS	2/O STANGAS	C/O O'NEILL

Unit 5

Exercise C (page 105).

	City, Country	Latitude	Longitude
1	Genoa, Italy	44°N	8°E
2	Marseille, France	43°N	5°E
3	Barcelona, Spain	41°N	2°E
4	Valencia, Spain	39°N	0°W
5	Cartagena, Spain	37°N	0°W
6	Gibraltar	36°N	5°W

Unit 7

Exercise E (page 161)

Deadweight: 6.149 mt
Hold capacity: 286.286 m^3
Container capacity: 377 TEU
Hatch openings: 20x20 m
Main deck SWL: 15 t/m^2
Crane reach: 20 m
Crane SWL: 15 mt
Container crane capacity: 30 TEU/h
Ore loader capacity: 2000 m^3/h
Cargo pump capacity: 2500 m^3/h
Maximum discharging rate: 2000 mt/h
SWL of fork-lift truck: 3 mt
SWL of slings: 2 mt

Exercise D (page 168)

Item	Price ($/kg)	Quantity	Total
Apples	1.25		
Bananas	1.20		
Onions	0.60		
Tomatoes	1.00		
Butter	1.65		
Olive oil	4.50		
Sliced White Bread	0.80		
Rye bread	0.90		
Rolls	0.25/roll		
Beef fillet	6.00		
Pork chops	5.00		
Sausages	5.00		
Chicken	4.00		
Beer	1.00/750ml can		
Red Wine	4.00/litre		

Unit 8

Exercise on Pilot Card Information (page 187).

PILOT CARD

SHIP'S PARTICULARS

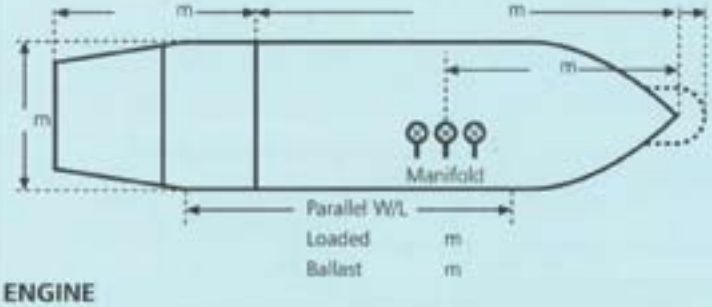
Name LAZY LIZARD Call sign SGYZ7

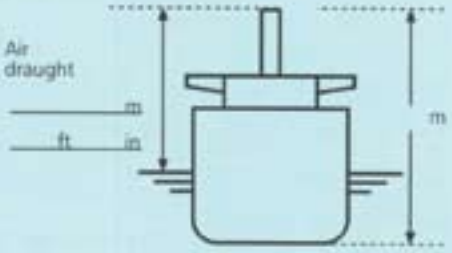
Displacement 61.002 (tonnes) Deadweight 116.050 (tonnes) Year built 2008

Length OA 256 (m) Breadth 45 (m) Bulbous bow: yes

Draught fwd 7,5 (m) Draught aft (m) Draught amidships (m)

Port anchor (shackles) Stbd anchor 14 (shackles) (1 shackle=27.4 m/15 fathoms)





ENGINE

Type of engine SULZER 12 RTA (DIESEL) Maximum power 42.000 (kW) 57.000 (HP)

	rpm/pitch	loaded speed		ballast speed	
Full ahead	62	15	(kts)	16	(kts)
Half ahead	53	12	(kts)	13	(kts)
Slow ahead	44	9	(kts)	10,3	(kts)
Dead slow ahead	30	8	(kts)	8,6	(kts)
Dead slow astern	30				
Slow astern	44				
Half astern	53				
Full astern	62				(% of full ahead power)

Engine critical rpm Maximum number of consecutive starts 23

Time full ahead to full astern (sec) Time limit astern (min)

Unit 9

Exercise (c) (page 198).

1. E 6	5.
2. NW 6/8	6.
3.	7.
4.	

Unit 12

Exercise (f) (page 263).

⇨ *[type of injury: bone fracture]*
It may be broken. Don't move it. I'll put an inflatable splint to keep it still.
⇨ *[type of injury: internal abdominal bleeding]*
Lie in bed with your head and shoulders raised. I'll take your pulse every 10 minutes.

Unit 13
BUNKERING CHECKLIST

Exercise (c) (page 292).

PRIOR COMMENCING BUNKERING	***DONE***
The Bunker Pre-Loading Plan has been completed and posted.	YES
An accommodation ladder is rigged.	NO
Plug all deck scuppers and ensure they are oil- and water-tight.	NO
Empty out and plug all save-alls.	YES
Place oil absorbent materials and oil brooms at designated locations.	YES
Inspect hose and couplings for damage.	YES
Establish two-way communication link with delivery vessel or facility.	YES
Agree on distinct hand signals for ship and bunker supplier.	YES
Sight, agree and record supplier meter readings or tank soundings.	NO
Ensure seamen are assigned to tend moorings.	YES
Prepare (line-up) the filling line – open all relevant valves.	YES
Check all valves on the system.	NO
DURING BUNKERING	***DONE***
Take ullages/soundings in order to determine the loading rate and cross check the calculated against the one claimed by the supplying facility.	YES
When a tank is 70-80% full decrease loading rate and take ullages more often.	YES
Check continuously bunker hoses / connections for leakage.	YES
Close valves as each tank is completed.	YES
Witness, seal, date, jointly countersign, and retain bunker samples.	NO
Give ample warning to the terminal / barge before the final notification or the interruption of the flow.	YES

Notify supplier when final tank is reached.	NO
On completion, close all filling valves.	YES
AFTER BUNKERING	***DONE***
Ensure all hoses are fully drained.	YES
Close and blank off manifold connections.	NO
Blank off disconnected hose couplings.	YES
Reconfirm all bunker line and tank filling lines are secured.	YES
Reconfirm all bunker tank soundings.	YES
Sight, agree and record shore/barge meter readings or tank soundings.	YES
Verify all details on bunker receipt are correct.	NO
Complete all relevant entries in Oil Record Book and Log Books.	NO

Unit 15

SMCP checklist.

Exercise (B) (page 321).

☐ QUESTION From what direction are you approaching?
☐ QUESTION What is your port of destination?
☐ INFORMATION I am entering the fairway.
☐ ADVICE Advise you keep your present course.
☐ REQUEST I require two tugs.
☐ WARNING Uncharted reef reported in area around Buoy No. 18.

Appendix for Marine Engineers – Part Two

Exercise B (page 402)

tie rod	piston	flywheel	connecting rod	crosshead bearing	exhaust valve	crankcase bed
piston rod	A-frame	scavenge air receiver	cylinder	sump tank	lube oil lines	fuel pump
crankshaft	crankcase door	crankpin bearing	cylinder cover	cooling water (air cooler)	camshaft	turbo-charger

APPENDIX III
Audio material transcripts

Part One

Audio • CD tracks

1. Unit 1 Section 2, Exercise A (p. 17)
2. Unit 1 Section 2, Exercise B (p. 17)
3. Unit 1 Section 2, Exercise D (p. 18)
4. Unit 1 Section 3, Exercise B (p. 20)
5. Unit 1 Section 4, Exercise B *(message 1)* (p. 20)
6. Unit 1 Section 4, Exercise B *(message 2)* (p. 20)
7. Unit 1 Section 5, Exercise A *(announcement 1)* (p. 21)
8. Unit 1 Section 5, Exercise A *(announcement 2)* (p. 21)
9. Unit 1 Section 5, Exercise A *(announcement 3)* (p. 21)
10. Unit 1 Section 6, Exercise I(b) (p. 23)
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13. Unit 2 Section 1, Exercise A (p. 34)
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15. Unit 2 Section 2, Exercise A *(speaker 1)* (p. 35)
16. Unit 2 Section 2, Exercise A *(speaker 2)* (p. 35)
17. Unit 2 Section 2, Exercise C (p. 36)
18. Unit 2 Section 2, Exercise D (p. 36)
19. Unit 2 Section 3, Exercise B (p. 39)
20. Unit 2 Section 4, Exercise A (p. 40)
21. Unit 2 Section 4, Exercise E (p. 43)
22. Unit 2 Section 4, Exercise E (p. 43)
23. Unit 2 Section 5, Exercise B (p. 47)
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25. Unit 2 Section 5, Exercise D (p. 48)
26. Unit 3 Section 1, Exercise (c) (p. 57)
27. Unit 3 Section 4, Exercise C (p. 65)
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29. Unit 3 Section 6, Exercises G & H (p. 75)
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39. Unit 5 Section 1, Exercise A (p. 104)
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41. Unit 5 Section 2, Exercise A (p. 106)
42. Unit 5 Section 3, Exercise A (p. 107)
43. Unit 5 Section 4, Exercise A (p. 115)
44. Unit 5 Section 4, Exercise C (p. 115)
45. Review 1 Exercise 1 (p. 124)

Unit 1: IMO Standard Marine Communication Phrases

1. Section 2, Exercise A ***Maritime Phonetic Alphabet.*** (page 17)

A	Alfa	H	Hotel	O	Oscar	V	Victor
B	Bravo	I	India	P	Papa	W	Whisky
C	Charlie	J	Juliet	Q	Quebec	X	X-ray
D	Delta	K	Kilo	R	Romeo	Y	Yankee
E	Echo	L	Lima	S	Sierra	Z	Zulu
F	Foxtrot	M	Mike	T	Tango		
G	Golf	N	November	U	Uniform		

2. Section 2, Exercise B ***Names***- answer key in bold (page 17)

- ARVANITIS or **ARVANITES**
- BAILEY or **BAILLEY**
- **PAPANIKOLAOU** or PAPANICOLAOU
- YIANNIOTIS or **GIANNIOTIS**
- **WHITE** or WHYTE
- **JACQUE** or JACKUE
- **FUIDIZI** or FUIDIXI

3. Section 2, Exercise D **VTS COMMUNICATION** – answer key (page 18)

VESSEL'S NAME:	PACIFIC SPIRIT
CALL SIGN:	A8HQ2
SHIP'S FLAG:	LIBERIA

IMO NUMBER:	8600193
LAST PORT OF CALL:	MUNDRA, INDIA
DESTINATION:	PIRAEUS
NEXT PORT OF CALL:	LIVORNO, ITALY
VESSEL COMING TO PILOT STATION:	☐ YES TIME: 1030 ☐ NO
NUMBER OF CREW MEMBERS ON BOARD:	25
NUMBER OF PASSENGERS ON BOARD:	NONE
AMOUNT OF CARGO:	____4654_____ units _____6414,6_____ metric tones
TYPE OF CARGO:	MOTOR VEHICLES

4. Section 3, Exercise B ***Numerical phrases*** – answer key (in bold) (page 20)

- **14.40** or 14.30
- **4th Engineer** or 4 engineers
- **3rd Officer** or Radio Officer
- 23rd or **23**
- **14th** or 40th
- the fifth vessel or **the fiftieth vessel of the company**
- 15.00 or **13.00**
- **08.15** or 08.50
- 16th May or **6th May**
- **17.30** or 19.30

SMCP: Distress, Urgency and Safety Signals

5. Section 4, Exercise B Message #1 (page 20)

MAYDAY MAYDAY MAYDAY
THIS IS TWO-FOUR-ZERO-EIGHT-NINE-SEVEN-ZERO-ZERO-ZERO MOTOR VESSEL "AEGEAN ACE" CALL SIGN SIERRA VICTOR ALPHA TWO TWO NINE ZERO
POSITION THREE SEVEN DEGREES NINE FOUR MINUTES NORTH TWO THREE DEGREES SIX THREE MINUTES EAST
I AM ON FIRE AFTER EXPLOSION
I REQUIRE FIRE-FIGHTING ASSISTANCE
OVER

6. Section 4, Exercise B Message #2 (page 20)

SÉCURITÉ SÉCURITÉ SÉCURITÉ
ALL SHIPS ALL SHIPS ALL SHIPS IN THE VICINITY OF MEDITERRANEO STATION
THIS IS TWO-THREE-NINE-EIGHT-THREE-TWO-ZERO-ZERO-ZERO MOTOR VESSEL "RAVENNA" CALL SIGN SIERRA X-RAY TANGO HOTEL
DANGEROUS WRECK LOCATED IN POSITION THREE NAUTICAL MILES NORTH OF MEDITERRANEO STATION
OVER

PA Announcements: Passenger Care

7. Section 5, Exercise A *Announcement 1* (page 21)

Ladies and gentlemen. This is Captain Antoniou speaking.
I have pleasure in informing you that all safety equipment is in full working order. The bow and stern doors are all closed and secured. The vessel is in all respects ready for sea. Please listen carefully to the safety instructions which follow. In the unlikely event of an emergency, please obey the orders given on the public address system.
Passengers are also requested to read all notes and leaflets concerning safety regulations.
Thank you.

8. Section 5, Exercise A *Announcement 2* (page 21)

Safety regulations do not permit passengers to enter the following spaces; navigating bridge, engine room, manoeuvring areas at the front and back end of the ship, all areas and spaces and compartments marked "Crew only". Please remember passengers are not allowed to enter car decks when the vessel is at sea. Thank you.

9. Section 5, Exercise A ***Announcement 3*** (page 21)

A drill will be held to familiarize passengers with their assembly stations, with their life-saving equipment and with emergency procedures. All passengers must attend this drill. Passengers will be taught how to act and behave in case of emergency.
When the general emergency alarm is sounded, which consists of seven short blasts and one prolonged blast, all passengers have to go to their assembly station. Take your lifejackets and blankets with you. Lifejackets are stored in your cabins under your beds and at your assembly stations. You are encouraged to try on your lifejacket.
Listen now to the instructions on how to put on your lifejacket and follow closely the demonstration given by the crew.

Pull the lifejacket over your head.
Tighten the strings well.
Pull the strings around your waist and tie in front.

10. Section 6, Exercise I(b) ***Helm orders*** (page 23)

#1. Midships.
#2. Meet her.
#3. Steady.
#4. Ease her.
#5. Steady as she goes.

11. Section 6, Exercise II(b) ***Course to be steered by compass*** (page 24)

#1. Port, steer one eight zero
#2. Starboard, steer zero five two
#3. Starboard, steer zero nine nine
#4. Port, steer one three zero

12. Section 7, Exercise B ***Briefing before handing over watch*** (page 24)

We are entering the port of Aden area; it's an area with heavy traffic.
As you can see on the display, our present position is Lat 12° 45.5´ N, Long 044° 57´ E.
ETA at the port dredged channel is 0715 hrs UTC. True course is 027° and speed over ground is 14 knots. Present maximum draft is 8.5 meters.
Port side radar is at eight miles range scale. Starboard radar is at 10 miles. The radar is at true-motion north-up representation. GPS is operational, Navtex is on and VHF DSC channel 70 and DSC controller are switched on, too.

Unit 2: The seafarer

13. Section 1, Exercise A ***"Seaman's book questions"*** (page 34)

1. What is your surname?
2. What is your first name?
3. Where are you from?
4. What is your date of birth?
5. What is your seaman's book number?

14. Section 1, Exercise B ***"Welcome on board dialogue"*** (page 34)

Captain: Welcome on board. I am Captain Fotiou.
2nd Engineer: Good morning, Captain. I am the new Second Engineer.
Captain: What is your surname?
2nd Engineer: Lontaris.
Captain: And what is your first name?
2nd Engineer: Michael.
Captain: Do you have your seaman's book?
2nd Engineer: Yes. Here, Captain.
Captain: What is your seaman's book number?
2nd Engineer: ST 64990.
Captain: Where are you from?
2nd Engineer: I'm from Greece.
Captain: Oh, OK. There are four more Greek crew members on board. Greek seafarers have a good reputation. What is your date of birth?
2nd Engineer: 11th May 1984.
Captain: Are you married?
2nd Engineer: Yes. I am married.
Captain: Do you have children?

2nd Engineer: No, I don't sir.
Captain: First we have a period of familiarisation; you must become familiar with the vessel and especially its safety equipment. But now, let's go and meet the Chief Engineer.
2nd Engineer: Thank you, sir.

15-16. Section 2, Exercise A ***"Two seafarers introduce themselves"*** (page 35)

Hello, my name is Yiannis Alexiou and I am the Chief Mate on the M/T "Maria". I am 40 years old and have a wife and two children. My wife is a doctor and my two twin daughters are 4 years old. I live in Thessaloniki, Greece and I am a fan of ARIS Salonika.
Hello, I am Fiona Briggs, the Second Mate on the Container Ship "Star". I live in Toronto, Canada. Toronto is a multi-cultural city of 2,5 million people from many different ethnic groups. I am 25 years old and this is my first voyage as a Second Mate. I am single but I want to have a family in the future.

17. Section 2, Exercise C ***"Read the names to me"*** (page 36)

Crew Manager: Good morning. This is Mr Black from the company's local office.
Captain: Good morning. This is Captain Fotiou , M/V Carol.
Crew Manager: I have the names of the new crew joining you in the next port of call.
Captain: Please read the names and nationalities. And their age, if it is possible.
Crew Manager: Of course.

NAME	RANK	NATIONALITY	AGE
PAREZ, Manuel	Bosun	Peruvian	43
VOLDUNI, Tony	Assistant Engineer	Italian	50
HAZEVELD, Henrik	Second Mate	Dutch	37

Captain: Repeat the first two names, please.
Crew Manager: PAREZ, Papa Alpha Romeo Echo Zulu. And VOLDUNI, Victor, Oscar, Lima, Delta, Uniform, November, India.
Captain: OK, thank you.
Crew Manager: One more thing, can we check some information on the crew list, please? I need the name and date of birth of the two French deck cadets.
Captain: The crew list? Stand by… Let me find the French deck cadets on the list. The first one is Jerry GOLDSMITH, Golf Oscar, Lima, Delta, Sierra, Mike, India, Tango, Hotel, and his date of birth is 4th January 1990. The second one is Carrie KAPLAN, Kilo, Alpha, Papa, Lima, Alpha, November, and her date of birth is 2nd July 1988.
Crew Manager: Thank you very much. That's all for now. Goodbye.

18. Section 2, Exercise D ***Welcome dialogue*** [C/M is Taiwanese, O.S. is American] (page 36)

C/M: Welcome on board. I am the Chief Mate.
O.S.: Good morning Chief. I am the new OS.
C/M: Do you have your seaman's book?
O.S.: Yes. Here, Chief.
C/M: What is your seaman's book number?
O.S.: B 45 2198. And this is my passport.
C/M: What is your family name?
O.S.: Parker. Papa Alpha Romeo Kilo Echo Romeo.
C/M.: And what is your first name?
O.S.: Bob.
C/M.: Where are you from, Bob?
O.S.: I'm from Los Angeles in California.
C/M: Oh, OK. There is another American on board. The cadet. Are you married?
O.S.: No, I am not married.
C/M: What is your date of birth?
O.S.: 20th July 1979.
C/M: And where did you work before?
O.S.: I worked as a deck hand on the BRIGGITE, a Reefer.
C/M: What were your tasks in the previous vessel?
O.S.: Washing, cleaning and scrubbing the deck, oiling and sanding wooden parts, working with the chipping hammer and painting. I'm a good worker, Chief.
C/M: Good. I will guide you to the rating messroom to meet the Bosun. You will take orders from him. He will take you to your cabin and then you can go and meet the captain.
O.S.: Thank you Chief.

19. Section 3, Exercise B ***EU and the Maritime profession*** (page 39)

In his speech for Hellenic Maritime Day 2007, entitled "Shipping and the EU in the 21st century – Quality Shipping", Jacques Barrot emphasizes the importance of shipping for Greece and the EU. He mentions that the maritime sector is considered a matter of national honour in Greece. "And rightly so," he adds, "since the fleet controlled by Greek interests is the biggest in the world. The tonnage under the Greek flag represents almost one fourth of the total tonnage under the EU flags. More than 600 ships are currently under construction for Greek owners and many will be flagged under the Greek flag" (p. 2-3)

The vice-president stresses two of the main issues regarding maritime transport that the Commission is interested in:

– how to further improve the quality and competitiveness of EU shipping
– how to attract young people to the profession

The vice-president puts emphasis on the fact that "all economic forecasts show that the sector has the potential for constant progress and expansion. However, there is a threat coming from the inside: the increasing shortage of European seafarers (particularly officers).This shortage and the decreasing maritime know-how represent a real threat not only to the maritime profession itself but also to the entire maritime cluster" (p.8).

After drawing attention to the proposals presented by the Commission in its "3rd maritime safety package", he finishes his talk by highlighting the "main challenges for European shipping in the future. The first, and most urgent challenge, is the human element. It is urgent to attract, train and maintain European professionals, both on board ships and ashore. Without adequate and qualified human resources, European shipping will suffer and decline" (p.9).

20. Section 4, Exercise A ***Ranks and responsibilities*** (page 40)

[Chief Cook]: It is my job to decide on the menu and supervise meals.

[The Master]: I am in charge of everything and everyone on board. I do not stand a watch but in reality I am on duty 24 hours a day; I am also the last to abandon ship in case of a disaster. My work involves a lot of paperwork. And I pay the crew.

[Chief Officer]: I am second in command under the Master and take command if the Master cannot command the ship; I stand a watch on the bridge when the ship is at sea. My watch is usually the 4-8 watch and involves all ordinary work on the bridge; seeing that we steer the correct course, posting radar and visual lookouts and monitoring the navigational equipment and their readings. I also have to make sure that deck department equipment is in good working order.

21-22. Section 4, Exercise E ***Two interviews: Roles of officers*** (answer key) (page 43)

	Interview 1	Interview 2
Name of vessel:	PROPONTIS	CHIOS
Type of vessel:	Clean tanker	VLCC
Cargo:	Oil products	Crude oil
Year built:	2006	–
Trading Area:	Baltic Sea	–
LOA (length overall):	–	337 metres
Breadth:	–	60 metres
Number & nationality of Second Officers onboard:	3, 2 Greeks and 1 Filipino	3
Number & nationality of Third Officers onboard:	1, Russian	None
Roles of Second Officers:	Designated as: Navigation Officer Safety Officer	Designated as: Safety Officer Navigation Officer GMDSS Operator
C/O designated as:	Cargo officer	Medical Officer

23. Section 5, Exercise B ***Interview: Duties of an engineer cadet*** (answer key) (page 47)

– Overhauling is when you open up a machinery take out its parts and replace them to keep it working properly, after a certain amount of working hours.
– You do overhaulings in machinery such as a diesel generator, fuel oil purifier or fuel oil high pressure pump.
– You must learn how to operate the cargo oil pump turbine to discharge fuel to the shore connection.
– You normally work 8 hours and then rest in your cabin, but when a problem is caused you need to work overtime.

– Extra time is added to your normal hours when you are on stand-by before a terminal or sea passage, or for a special job, such as piston overhauling, which takes 8 hours.
– The Chief Engineer sends information to the company about fuel consumption and the PMS.
– Every morning the Second Engineer gives the orders to Third Engineers, the oiler, the wiper and the cadet, divides the overhaulings and the cleanings, and reports to the Chief Engineer.
– The cadet must know all the valves we open and the pipelines we use for bunkering.
– You take the fuel samples and send them to a chemical lab to check if there is water or contaminants.
– Special ratings, such as technicians, come to do a special overhauling, such as replacement of Main Engine turbo charger.
– The fitter does all the welding for the pipes, if they must be replaced because they have holes due to corrosion.

24-25. Section 5, Exercise D ***Two interviews: Duties of a deck cadet*** (answer key) (page 48)

– A cadet normally works four hours on deck and four hours on bridge, but s/he works mostly on the bridge if there are extreme weather conditions.
– Depending on his nationality, the Bosun is sometimes responsible for the deck cadet's duties on deck.
– You have too much work on deck, if the vessel is old.

Unit 3: Ship familiarisation

26. Section 1, Exercise (c) ***Parts of the ship: on a multi-purpose vessel*** (page 57)

So, good day ladies and gentlemen. You have a picture now in front of you, a multi-purpose ship, also called a general cargo ship.
And if we look from the forward part and move to the aft part and identify a few things, we immediately can see in the very front, in the bulbous **bow**, the **forepeak tank**, where the captain sometimes stores water used for ballasting or for trimming the ship.
At forward we also have a thruster, it is called, No 38, **a bow thruster**, and some ships beside the bow thruster forward also have a stern thruster in the aft part of the ship. But this ship does not have that here.
What else do we see? Well, a very important thing is **the anchor or the windlass** up on the forecastle of the ship. The anchor is used of course when the ship needs to be staying in position at the port anchorage area waiting to go alongside to do cargo handling. The windlass is also used for handling the mooring ropes to make sure that the ship can stay alongside the quay while she is in the port.
No 34 is **a breakwater bulkhead** to prevent the green sea to roll into the # 2 and # 1 holds and maybe enter into the cargo compartment. But to protect the cargo hold we have No 32, the hatch covers. Here's a little bit of a strange identification, or words. **Hatch cover** and **hatch opening** and **hatch coaming** is usually the entrance into the cargo hold. So, separate between hatch (the opening), and hold that is the whole compartments for taking the cargo.
We forgot maybe No 33, where we have **the navigational lights** at **the forward mast**. There is also an **aft mast**, No 9, where the ship also has some navigational lights, depending on the size of the ship, so that other ships can identify our ship when it's dark.
Back to **the cargo hold**, and we have in # 1 hold bulk cargo, [No] 30, that has been loaded. Bulk cargo is sometimes loaded in multi-purpose ships or general cargo ships but mainly, of course, you see the bulk cargo in purpose-built ships, in bulk carriers that are made to move bulk cargo.
No 28 is a very sensitive point, particularly when handling **bulk cargo**. It is the hatch coaming. Bulk cargo is usually unloaded with a grab and the poor people sometimes touch the hatch coaming, [No] 28, with a grab and if they do the hold will not be watertight any more. The hatch covers, [No] 32, will not cover up the hold to prevent the green sea from entering. So, one has to be very careful in maintaining the hatch coaming for this reason.
In the other hold, No 2, they have loaded, in [No] 26, **containers**, containing general cargo. And you can see that also No 25, that **tank top** is the floor in the hold where the captain has stored his cargo, in this case containers.
So, what else, if we continue our voyage to the aft of the ship, we have No 22. Many cargo ships have a lot of **fans** in order to assure that humidity (sweatening) is taken away from the cargo compartments because the wetness can of course destroy the cargo, and particularly if the cargo is as in No 20, rolls of paper.
No 19 shows you that in the cargo hold we have a tweendeck, **a tweendeck** separating the cargo hold in a lower hold and a tweendeck to store different cargoes.
And the cargo No 18 is called project cargo, usually a cargo with very strange configurations and usually very heavy and difficult to handle when both loading and unloading the cargo. [No] 16 is **a vertical bulkhead**, this is what we call it, and [No]15 you see another bulk cargo loaded.
No 4 is very important, we have to have fire extinguishers and No 4 shows how **CO2 (Carbon Dioxide) bottles** are stored for use in case there is a fire on board the ship.
And No 3 is of course very important. This is **the engine room** that makes the **propeller**, No 2, to rotate, to make the ship go forward. There are many different types of propellers, either you push or you pull the ship forward, depending on how the propellers are constructed.
In the very end of the ship you see the rudder. The rudder is of course a tool for changing course, changing direction or

the heading of the ship when she moves into the water. And this rudder is controlled from the bridge, where the navigational activities take place on the very top of the aft part of the ship.
You also have in the aft part No 5 that is **a man overboard lifeboat**. And if there is, for instance, a lot of fire in the water, because oil has been coming out around the ship, it's very clever to go to No 6 instead, that is a free fall lifeboat. And, as you can see, that boat is covered, so people can stay inside there and sail in water that is full of flames from oil that has caught fire.
In the aft you see also No 8, that is **the funnel** from where the exhaust gases from the engine room are guided into the environment and we get air pollution that is very much discussed in today's shipping.
So now we have moved from the forward part to the aft part and identified some important things that we see. So, I wish you good luck with your future studies. Thank you.

27. Section 4, Exercise C ***"Places on board the Grampian Surveyor"*** (page 65)

Attention please. Welcome on board the Grampian Surveyor. I have a little information for you about the facilities on this ship. We are now in the lounge. The messroom and the galley are on this same level too. The hospital is one level up, on the upper deck. Please make sure you know where it is. There is a gym on the upper level too, and you can wash your clothes in the washing machines in the laundry, next to the gym. Finally, to familiarize yourself with the vessel, study the vessel information handbook in your cabin.
And, where are the liferafts captain?
The liferafts are on the Forecastle deck. Don't worry, there are six liferafts on board!

28. Section 4, Exercise D ***Accommodation: Location of living quarters on 4th deck*** (page 65)

At the forward part of the fourth deck, there are the Captain's and the Chief Engineer's cabins. The Captain's cabin is on the starboard side and opposite it, on the port side, is the Chief Engineer's cabin. The Ship's Office is in the middle, next to the store room. Aft of the Ship's Office there is an escape route leading to the ladder and giving access to all the corridors. There are cabins on both sides of the corridors. The Chief Officer's cabin is on the starboard side, next to the Captain. And on the port side, between the Chief Engineer's cabin and the ladder, we find the Ship Owner's cabin.

29. Section 6, Exercises G & H ***LNG Shipping Overview*** (page 75)

30. Section 7, Exercise B ***"Auxiliary vessels"*** (page 77)

We are going to look at some examples of auxiliary vessels.
First, we will consider **tugs**. Tugboats are relatively small ships with a large pulling power. A common characteristic of all tugboats is their low aft deck. This is to provide the towing wire with some freedom of movement.

– Seagoing tugs are used for:
  • salvage,
  • towing,
  • anchor handling in the offshore industry,
  • environmental service and
  • assistance to ships with engine and/or steering problems.

Tugs can tow to a position at sea any floating object, like partly completed ships, floating wrecks, docks, drilling rigs and other large objects.

– Escort tugs are used to escort large ships along dangerous passages. They have been developed after a number of serious tanker accidents in recent years. Escort tugs operate in confined coastal waters and are small seagoing tugs that can push or pull a large ship away from a dangerous area when its own propulsion is not sufficient.
– Harbour tugs are used in ports, inland waterways and coastal areas for:
  • assisting and towing vessels in and out of ports
  • salvaging, or assisting in salvage in ports or coastal waters
  • fighting fires and environmental disasters
  • keeping ports free of fixed ice

Secondly, we move to the **icebreaker**. Icebreakers are similar to tugboats; a large engine power in a relatively small ship and moreover they are fully equipped for towage and salvage. Their main function is to cut a channel through an ice-layer at sea, in a port, a river or other (inland) waterways.
Finally, another important type of auxiliary vessel is the **pilot boat**. Entering and departing of a port needs to be carried out in a safe way. The ship's crew often has limited knowledge of local conditions. Dangers, recent changes, customs and rules are different from port to port or changing continuously. Therefore local knowledge is hired in. Usually this is a pilot coming on board just before entering the particular port. That pilot can be boarded or debarked by

– a tender (small fast boat) coming from the actual port,
– a pilot boat at station at sea, close to port,
– a helicopter (often only for very large ships)

From shore, a ship can get directives how to manoeuvre from a so-called Vessel Traffic Service (VTS). A VTS controls the shipping using a shore-radar system and radio communication. A shore-based controller informs the ship's crew and/or the pilot about possible hazards and about other traffic.

31. Section 7, Exercise E ***"Vessels of Assistance and Service"*** (page 78)

Vessels of assistance and service are designed to perform specific tasks, for example assisting other vessels, or providing special services to navigation.
A tug is a vessel that assists other vessels with entering or leaving port, tows an oil rig to its position or assists with a salvage operation. There are sea-going and harbour tugs. Their engines can develop enormous powers. The largest and most powerful tugs are often fitted with Controllable Pitch Propeller (C.P.P.) that have adjustable blades. In order to manoeuvre well in difficult situations, tugs have bow thrusters and stern thrusters. One of the main features is that the aft deck of a towing vessel is kept clear of all obstructions that may interfere with the towing line.
A SAR-vessel performs Search and Rescue when a ship is in distress. She can develop high speeds and is equipped with the most modern communication equipment to maintain contact with Rescue Co-ordination Centres (RCC).
A pilot tender (or pilot launch) is a small boat that may be launched from the pilot boat. The pilot will embark the ship that has requested pilotage from the pilot tender. She is often fitted with a sheltered aft deck to prevent the pilot from getting wet.
A cable layer lays cables on the bottom of the sea. This type of ship is often equipped with a Dynamic Positioning System to keep her in the exact position when the submarine cable is reeled off.
A lightship serves as a beacon for navigation and is anchored in the vicinity of crowded channels or seaways. She is usually not self-propelled, which means she has to be towed to her position.
Icebreakers are designed to ride up the ice and crush a way through for other ships to follow. This requires a powerful engine and a considerable strengthening of her stem.

32. Round-Up, Exercise D ***"What type of ship do they work on?"*** (page 79)

Speaker 1: I like my work, but we work for many hours every day. It's really hard. Loading is done by means of pipes.
Speaker 2: I work on a ship that is really nice. It's very big and has many facilities, bars, restaurants, swimming pools, etc. Plus I get to meet a lot of people every day.
Speaker 3. Dockside big gantry cranes do the loading for my ship. Everything is automatic, well organized and quick. Loading takes only 6 to 8 hours, so we don't stay in port for long.
Speaker 4: We usually transport grain, but sometimes we may transport other products, like iron-ore. It depends.
Speaker 5: Whenever ships are in trouble we go. I like my job and the good thing is I don't have to be far from home for a long time.
Speaker 6: We carry meat on my vessel and we are careful to keep the correct temperature.
Speaker 7: The captain needs someone to guide him in the harbour or in narrow waters. That's when he asks for my vessel.
Speaker 8: The vessel I operate is a specialist one. It's also noisy and dirty. You use it when there is mud in the sea or you need a deeper port.

Unit 4: Safety equipment on board

33. Section 3, Exercise A ***Safety on Board [SMCP B2]: Oral commands that mention life-saving items*** (answer key in bold) (page 88)

[general emergency activities]

1. Operate the **general emergency alarm** / fire alarm.
2. All officers to go / **report** to the bridge.
3. Watchkeepers remain at **stations** / locations until further order.
4. Take **lifejackets** / life rafts with you.
5. Take your emergency equipment with you according to the safety list / **muster list**.
6. Follow the safety routes / **escape routes** shown.
7. Do not go to the **lifeboat stations** / lifebuoy stations before ordered.
8. Provide first aid in the vessel's office / **hospital**.
9. Watchkeepers to **assembly** / eye rinse stations.
10. Put on your emergency suits / **immersion suits**.
11. Passengers and crew! Follow the lifeboatmen to the lifeboat stations on the operation deck / **embarkation deck**.
12. Throw **overboard** / onboard number 2 liferaft and report.
13. Salvage boat / **Rescue boat**! Assist number 2 liferaft and report.
14. Report the **total number** / whole number of persons in liferaft.
15. Fire rockets for embarkation / **identification**.

[checking status of equipment]

16. Check the **lifeboat** / liferaft equipment and report.
17. Release / **Launch** number two lifeboat and report.
18. Replace the liferaft in the next dock / **port**.
19. Secure the **inflation cord** / operation cord of number 2 liferaft.

[fire protection and fire fighting]

20. Check the transportable / **portable** extinguishers and report.
21. Fire on board! Fire fighting team must have protecting clothing, smoke helmets and **breathing apparatus** / breathing mask.
22. **Stand by** / Retreat first aid team.

[SAR on-board activities]

23. Man overboard on port side. Drop lifeboat / **lifebuoy**.
24. Switch on **searchlights /** toplights.
25. Stand by life-saving apparatus / **line-throwing apparatus** and report.

34. Section 4, Exercise I(a) ***"Where is the safety equipment?"*** (page 89)

C/O: First, tell me about your lifejacket. Where is your lifejacket?
Cadet: In my cabin, in the cupboard.
C/O: What about the lifebuoys? Can you tell me where they are?
Cadet: Yes, of course. On the deck railings, also on the bridge wings, and next to the pilot ladder.
C/O: Now, is there a Man Overboard boat on board?
Cadet: Yes, there is a rescue boat on the port side. In fact one of the lifeboats is a rescue boat.
C/O: And how many liferafts do we have on board?
Cadet: Let me think. Six liferafts.
C/O: How do we check that the liferafts are operational?
Cadet: Sorry, can you repeat the question, please?
C/O: When do you check that they work all right?
Cadet: Oh, during an abandon ship drill. That's when you release and launch the liferafts to check if they are operational.
C/O: Good. Tell me, how many hand flares are there inside the lifeboats?
Cadet: There are six hand flares. There are also four parachute flares and two smoke signals.
C/O: Where is the line–throwing apparatus?
Cadet: On the bridge, behind the chartroom.
C/O: Let's now move on to fire fighting. What is a fire plan?
Cadet: The fire plan is a diagram that shows the location of fire-fighting equipment on board.
C/O: OK. Where are the fire plans? Give me an example.
Cadet: In a special weather-proof container outside the entrances to the accommodation.
C/O: Where is the fireman's outfit?
Cadet: In the muster station.
C/O: And, in the galley, what fire-fighting equipment can you find in the galley?
Cadet: There is a fire blanket, and also a fire-extinguisher next to the door.
C/O: Ok, that's excellent. One last question. Where is the hospital?
Cadet: On the second level, next to the laundry.

35. Section 4, Exercise I(h) ***Checking the condition of LSAs: Inventory of Safety Equipment*** (page 93)

C/O: Come in. Have you inspected the safety equipment?
3rd/O: Yes, Chief, everything is in good working order.
C/O: Good. I need to fill in some expiry dates on the inventory. Can you help me with that?
3rd/O: Of course. I have my checklists right here.
C/O: Let me fill in the date on the inventory first; today is the 25th of March 2008. Now, let's see. Oh, yes. The batteries. I'm always a bit concerned about batteries. Do we need to change any of them? I can see here that the expiry date of the batteries for the Radar Transponder is March 2009, in one year's time, is that correct? OK. What about the EPIRB battery?
3rd/O: That expires in August 2011. And the batteries for the portable two-way VHF, let me check, January 2012.
C/O: OK. What about the Immersion Suits? Do we need to replace any of them?
3rd/O: Not until October 2008.
C/O: October ..08. And, the line–throwing appliances?
3rd/O: The line–throwing appliances? All four of them expire in May 2009.
C/O: Fine. The First Aid Kit in the Free Fall Lifeboat, when is the expiry date for that?
3rd/O: January 2009.
C/O: Is there anything that has a short expiry period? Anything that expires within the next few months?
3rd/O: Well, the handflares in the free fall lifeboat expire in May, the release system of the port side liferaft expires in June, the auto release system of the EPIRB expires in August, and the Immersion suits, as we said earlier, in October.
C/O: Let me note these down. The handflares, yes they have a three year duration and the manufacture date was May 2005, so they expire in May 2008. The liferaft hydrostatic release expires in June 2008, and the EPIRB auto release in August 2008. And of course the immersion suits. I'll mark these with red letters, then. Good job, thank you.

36. Section 5, Exercise II ***News Report: Titanic Lifejacket.*** (page 99)

37-38. Section 5, Exercise IV(a) ***Two interviews: Lifeboat drills*** (answer key) (page 101)

– The first thing you learn as a cadet is where your muster tation is.
– The Master supervises drills from the bridge.
– The role of the Master's messenger is to transfer information from the bridge to Officers. Nowadays, of course, there is VHF bridge-to-crew communication to do this.
– The Chief Officer is responsible for all the drills, since s/he is the Safety Officer.
– The Cadet must observe the lowering operation and assist A/Bs if necessary.
– When you enter the lifeboat you fasten your seat belt.

Unit 5: Work activities on board

39. Section 1, Exercise A ***"1000 nautical miles in the Mediterranean"*** (page 104)

Master: Tell me about the route, Chief. Is it charted?
C/O: Yes, Captain. We'll be in the Mediterranean for another 4 days. It's a total distance of approximately 1000 nautical miles: starting from Italy, then France and finally Spain, before we reach the Straits of Gibraltar and follow their traffic separation scheme.
Master: Which ports do we visit before the Straits of Gibraltar?
C/O: Here, have a look. It's five ports. Genoa, Marseille, Barcelona, Valencia and Cartagena.
Master: OK, tell me about the distances.
C/O: Let's see. Genoa to Marseille 204 nm, Marseille to Barcelona 207 nm, Barcelona to Valencia 180 nm, Valencia to Cartagena 172 nm, and Cartagena to Gibraltar 237 nm.
Master: And the total…you said approximately 1000 nautical miles. Remember to check the fuel bunkers, will you?
C/O: Of course, sir.
Master: Any special circumstances we need to take into account?
C/O: Well, yes, we received on Navtex a warning that there is an ordnance exercise in the Balearic sea area. So, to avoid it we'll deviate slightly.

40. Section 1, Exercise C ***Latitude and Longitude of European cities.*** (page 105)

	City, Country	Latitude	Longitude
1.	Helsinki, Finland	60°N	24°E
2.	Stockholm, Sweden	59°N	18°E
3.	Copenhagen, Denmark	55°N	12°E
4.	Amsterdam, the Netherlands	52°N	4°E
5.	London, UK	51°N	0°W
6.	Lisbon, Portugal	38°N	9°W
7.	Madrid, Spain	40°N	3°W
8.	Bern, Switzerland	46°N	7°E
9.	Rome, Italy	41°N	12°E
10.	Athens, Greece	37°N	23°E

41. Section 2, Exercise A ***Nautical Chart: Short Definition – answer key in bold*** (page 106)

Nautical charts contain information about the shape of the coast, the *lengths/**depths*** of the water and the general configuration of the *button/**bottom*** of the sea floor. Nautical charts also show locations of obstacles/***obstructions*** to navigation, the rise and fall of the *tights/**tides***, and locations of navigation *gates*/***aids***. Nautical charts make safe and efficient marine transportation possible.

42. Section 3, Exercise A ***"What is happening on deck?"*** (page 107)

C/O: This is the bridge. Who is speaking?
2nd/O: This is Capt. Fotis.
C/O: Is everything ready for the inspection? The inspector is arriving at 1300.
2nd/O: Don't worry sir. Everything is in order.
C/O: What is the Bosun doing?
2nd/O: He's supervising the ABs. Danilo and Bayani are lowering the embarkation ladder.

C/O: What is happening on deck?
2nd/O: Marcus, the OS, is washing the deck.
C/O: Is Ruperto washing the deck too?
2nd/O: No, he's greasing the anchor chain.
C/O: Where is the Third Officer at the moment?
2nd/O: He's checking the safety standards of the liferafts.
C/O: Who is accompanying him?
2nd/O: I think the cadet is helping him.

43. Section 4, Exercise A ***Daily Routine On board: The third officer talks about his day.*** (page 115)

Every morning I get up at 0730. I have breakfast at 0745 and then go to the bridge to take over the watch from the C/O. At 0800 I start my watch. I drink a cup of strong coffee at around 1030. At noon I hand over watch to the second officer. At 1215 I eat lunch in the galley. At 1300 I usually discuss matters that come up with the captain. Then I read magazines or listen to music, and usually I sleep at 15.00. I have free time until 20.00 when my next watch starts.

44. Section 4, Exercise C ***Daily work routine: Dialogue*** (page 115)

A: What do you do, Phil?
B: I work as an Inspector for the Port State Control of the port of Southampton.
A: What time do you go to your office?
B: I take the port minibus and I reach the office at around 0800 hours. You don't mind if I use "sea time", the 24-hour clock system, do you? It's a habit from work, you see. Well, then I arrange my schedule for the day. I usually perform two inspections per day, on a normal work day, that is.
A: What time is your first inspection?
B: At about 0900.
A: And what does it include?
B: I ask the crew questions about emergency procedures and drills, I check the ship's documents, particularly the crew identification and crew lists.
A: What time does the inspection finish?
B: It takes about 3 hours if nothing extraordinary comes up. So, I normally finish at noon.
A: What time do you have lunch?
B: I have lunch at around 1200. Then I normally start another inspection at 1300.
A: When do you finish work?
B: At 1700. Me and my colleagues usually meet at the office and review the day's inspections.

45. Review 1, Exercise 1 ***ANNOUNCEMENT: Vessel Information*** (page 124)
Attention please. Listen everyone. This is important information. I want you to note these particulars and then familiarize yourselves with the ship's life saving equipment and emergency procedures. This ship's name is Maxim: Mike Alpha X-ray India Mike – and her call sign is CORE7: Charlie, Oscar, Romeo, Echo, seven. The vessel is only 2 years old and the port of registration is Rotterdam. It is an LPG carrier, and we have 24 crew members on board. I want you all to look at the Muster List and then locate your emergency muster station and check your life boats. The same goes for life jackets, life buoys and life rafts. Also, check the location of the fire-fighting equipment on board this vessel. Spend the rest of the day familiarizing yourself with the ship's safety features. Do not hesitate to ask if you have any questions. Thank you.

Part Two

Audio • CD tracks

1. Unit 6 Section 2, Exercise B (p. 134)
2. Unit 6 Section 3, Exercise B (p. 135)
3. Unit 6 Section 4, Exercise II(c) (p. 139)
4. Unit 6 Section 5, Exercise C (p. 146)
5. Unit 6 Section 5, Exercise C (p. 146)
6. Unit 6 Section 5, Exercise D (p. 146)
7. Unit 7 Section 5, Exercise A (p. 166)
8. Unit 8 Section 1, Exercise I(a) (p. 172)
9. Unit 8 Section 2, Exercise VI(a) (p. 182)
10. Unit 9 Section 1, Exercise II(a) (p. 193
11. Unit 9 Section 2, Exercise II(k) (p. 202)
12. Unit 9 Section 2, Exercise III(a), *(clip i)* (p. 204)
13. Unit 9 Section 2, Exercise III(a), *(clip ii)* (p. 204)
14. Unit 10 Section 2, Exercise I(b) (p. 216)
15. Unit 10 Section 2, Exercise II(d) (p. 218)
16. Review 2 Section 2, Exercise A (p. 225)
17. Review 2 Section 5, Listening (p. 230)
18. Review 2 Section 6, Exercise A (p. 230)

Unit 6: Emergency on board

1. Section 2, Exercise B ***Missing person*** (page 134)

1. Determine where and when the person was last seen.
2. Organize a search of the vessel including decks, engine room and all accessible spaces.
3. Prepare to turn the vessel round and retrace the track to where and when there was a last sighting of the person.
4. Post additional lookouts.
5. Prepare the rescue boat for immediate use and have the crew standing by.
6. If the onboard search does not find the person, use the VHF to call to other vessels in the area asking them to keep a sharp lookout as they transit the area.

2. Section 3, Exercise B ***Distress communications: Announcing distress situations*** (page 135)

1. This is Bow Mariner. I am on fire.
2. I am aground. I require tug assistance.
3. I have collided with iceberg. Crew must abandon vessel after collision. I am flooding in the engine room.
4. I have dangerous list to port. I am in danger of capsizing.
5. I am sinking after explosion. I am in critical condition.
6. MV Morgan drifting at 10 knots to South East.
7. I am under attack by pirates.
8. MV Vectra has lost person overboard in position 20 degrees 35 minutes North 060 degrees 30 minutes West.

3. Section 4, Exercise II(c) ***Emergency Announcement*** (page 139)

Attention everybody. There is fire in the Engine Room. Fire is toxic. I repeat. Fire is toxic. Do not attempt to extinguish the fire. Proceed to you muster stations immediately. Prepare to abandon ship.

4-5. Section 5, Exercise C ***SMCP message markers*** (page 146)

1. QUESTION	Are dangerous goods on fire?
2. ANSWER	Yes, dangerous goods are on fire.
3. INSTRUCTION	All vessels in vicinity of position 15 degrees 35 minutes North 061 degrees 29 minutes West keep sharp lookout and report to Rescue Coordination Centre.
4. INFORMATION	Area around Super-Buoy No 2 temporarily closed for navigation.
5. QUESTION	When do you expect to refloat?
6. ANSWER	I expect to refloat when weather improves.

6. Section 5, Exercise D ***Full dialogue:*** (page 146)

QUESTION	What is your present speed?
ANSWER	My present speed is 14 knots – mistake.
	Correction, my present speed is 12, one-two, knots.
QUESTION	What is your draught?
ANSWER	My draught is 12.6, repeat one-two decimal 6 metres.
INSTRUCTION	Do not overtake – repeat – do not overtake.
	Say again.
INSTRUCTION	Do not overtake.

Unit 7: Cargo handling, quantities and supplies

7. Section 5, Exercise A ***INVENTORY*** (page 166)

Steward:	OK. Let's start with the fresh fruits and vegetables. I think we have got enough.
Cook:	There's never enough of them. How many kilos of apples have we got?
S:	Let's see. Two cartons with 5 kilos each, that's 10 kilos.
C:	We need one more carton, I think. I suppose I can make some apple-pie...
S:	What about tomatoes? Everybody loves fresh tomato salad.
C:	Let me count. 4, 5 packages, one kilo each: that comes out to 5 kilos. We definitely need some more.
S:	4 more packages should be enough. And there is too much tomato sauce. At least 20 tins.
C:	Now, look at the eggs. 10 packages with 10 eggs each, there are too many eggs.
S:	Right. How much milk have we got?
C:	There's too much milk, don't worry. I can count more than 50 pints. But there is not enough butter.
S:	That's because you use too much when you cook. Is a 5 kilo package enough?
C:	It will do. And there's too little white bread left. Let me count, only 5 packages of sliced white bread I can see. We must order at least another 15. And at least 50 rolls.

S: How many cartons of juice have we got? About 20?
C: That's right. We've got enough. Now, let's see about meat. I haven't used the chicken yet, there's about 10 kilos. But there isn't enough beef fillet, only about 4 kilos.
S: How much do we need, then? Is 5 kilos enough?
C: More. 10 kilos would be better. And we must order at least 15 kilos of pork chops and 20 kilos of sausages.
S: What about beer? We shouldn't forget that…
C: Of course. At least 40 cans. And we need more olive oil, at least 5 litres. We have enough salt and spices. And we are doing OK with flour, I think.

Unit 8: Vessel Particulars and Specifications

8. Section 1, Exercise I(a) ***Vessel particulars and technical specifications*** (page 172)

The vessel British Emerald is one of the largest LNG Carriers. The ship can carry 155,000 cubic metres of natural gas. Its measurements are 288m length and 44.2m breadth. With a deadweight of 76,700 tonnes, it was built in 2007 in South Korea in the ship yard of Hyundai Heavy Industries. It flies the British flag and is part of the fleet of BP Shipping. The ship is the first of the series of diesel-electric gas vessels with dual fuel (DFDE). The heart of the new DFDE is the Ecobot system, which is using LNG gas that evaporates from the tanks during the transportation to fuel the main power engine. The main engine works well with both gas and fuel oil. The new DFDE system is nearly 1-2% more expensive than the older ones, but it is 10% more effective.
One of the newest crude oil tankers built by Namura Shipbuilding, Japan, is called Atlantic Pioneer and it also flies the British flag. The crude carrier was completed on 1st October 2009 and has an overall length of 333 meters while her moulded breadth is 60 meters. The VLCC has a deadweight of 302,303 metric tons, while her gross tonnage is 159,943 gross tons. This large vessel was in need of a stronger and more reliable engine on board than previous tankers in the past, so the builders decided to use the latest technology of MAN-B&W engines, a main engine from the generation of Mark G.
The LCTC (Large Car Truck Carrier) m/v OBERON has a capacity of 8,000 cars or a combination of 3,484 cars and 466 buses. It was built to the highest specifications of Lloyd's Register of Shipping by Daewoo Shipbuilding and Marine Engineering in South Korea and was delivered in October 2008. With her 231.6 metres and 71,673 gross tonnage, she and her sister ship ANIARA are the world's largest car carriers. OBERON is built to the highest class of Lloyd's Register and is owned by Wallenius Lines, Sweden, flying the Swedish flag. Some more of the vessel's particulars include a breadth of 32.2 m and a deadweight of 30,134 t. She has 13 car decks, of which 5 are movable. The width of its stern ramp is 9.5 m and the stern opening height is 6.5 m.

9. Section 2, Exercise VI(a) ***The officers are talking about the NAVTEX receiver*** (page 182)

A: The NAVTEX receiver is out of paper. Can you take care of it, please?
B: Sure. Just tell me what to do because I haven't used this model before.
A: First press the POWER key to turn on the main power. Then, just open the paper cover and insert the paper roll. Hold the FEED key pressed until the paper is pulled in.
B: OK, ready. The display is a bit dark, though.
A: We can fix that. Just press the ILLUM key and change it from Half-light to Light. That's it. It's a good idea to do a self-Diagnostic test now, to make sure everything is in order. Just press the TEST key.
B: A self-test sounds good, and I bet it makes maintenance easier. The NAVTEX in my previous vessel was more modern but this one seems easier to operate.
A: It's also quicker in saving messages than newer models. In new ones you press EDIT and COPY to paste the messages using additional software. Here, you just press SAVE. It's more convenient.
B: Let's hope the paper doesn't jam easily. When this happens often it's a real nuisance. By the way, how do you correct paper jamming? Don't tell me, I'll check the manual, just to be ready. Let's see…"Correcting Paper Jamming"….

Unit 9: What weather is expected?

10. Section 1, Exercise II(a) ***What is a tsunami?*** (page 183)

Part One [definition / causes]

HOST: Welcome to Diving Deeper where we interview National Ocean Service scientists on the ocean topics and information that are important to you! I'm your host Kate Nielsen.
Today's question is….What is a tsunami?
A tsunami or tidal wave is a series of ocean waves caused by the displacement of a large volume of water.
To help us dive a little deeper into this question, we will talk by phone with Russell Jackson on tsunamis. Russell is a coastal hazards specialist with NOAA's Coastal Services Center. Hi Russell, welcome to our show.

RUSSELL JACKSON: Hi Kate, thanks for inviting me here today to talk to your listeners about tsunamis.
HOST: Russell, so what causes tsunamis?
RUSSELL JACKSON: Well Kate, tsunamis are commonly generated by earthquakes in coastal and marine regions. And most tsunamis are produced by large, usually greater than a seven on the Richter scale, earthquakes that are associated with movement along the oceanic and continental plates. They frequently occur in the Pacific Ocean, Pacific Basin, where there's dense oceanic plates that slide under the lighter continental plates. And when these plates fracture and move, the vertical movement of the plate actually transfers a lot of energy from the sea floor to the ocean and actually causes the wave to be created.
HOST: Is this how the catastrophic Indian Ocean Tsunami back in 2004 was generated?
RUSSELL JACKSON: Yes, it was a very powerful earthquake, a magnitude 9.0, and it was actually one of the largest earthquakes ever recorded, struck the coastal region of Indonesia. And the movement of the sea floor actually produced a tsunami in excess of 30 meters, or about 100 feet, along the adjacent coastline which actually killed over 240,000 people in Indonesia. And then, from this source, the tsunami radiated outward and within a few hours had claimed over 60,000 lives in Thailand, Sri Lanka, and India.

Part Two [prediction / signs]

HOST: Russell, can we predict a tsunami before it reaches the land?
RUSSELL JACKSON: Well Kate, predicting when and where the next tsunami will strike is currently impossible. But, once an earthquake has occurred and a tsunami is generated, we can forecast the tsunami arrival time and roughly what we think the impact will be through modeling and measurement technologies, but only a small window of time say 10 to 30 minutes can really be given to communities for local tsunamis. We have better capability for these long-distance teletsunamis to provide good information.
There are a few warning signs though that you may experience if you're in an area just prior to a tsunami that can help you if you're not aware of the warnings coming from go-vernment or through the radio or something. These things to keep in mind are if you see the water receding from the shoreline or if you see or hear approaching water, many tsunami survivors that I've talked to described the sound as a tsunami's approaching similar to a freight train approaching, very loud, also if you feel a strong earthquake. These are all good indicators that there could be a tsunami coming so you should right away just move to high ground.

11. Section 2, Exercise II(k) ***SHIPPING FORECAST;*** *issued 21 April 2011* (page 202)

The shipping forecast is issued by the Met Office on behalf of the Maritime and Coastguard Agency
There is a gale warning; for which area? Trafalgar
1. Viking / North Utsire / South Utsire
   - Wind: Variable, becoming mainly easterly later, 3 or 4
   - Sea State: Slight or moderate
   - Weather: Occasional rain or showers, fog patches
   - Visibility: Moderate or good, occasionally very poor
2. Forties / Cromarty / Forth / Tyne
   - Wind: Variable, becoming easterly or southeasterly 3 or 4
   - Sea State: Slight
   - Weather: Fog banks, occasional rain at first
   - Visibility: Moderate to very poor
3. Dogger / Fisher / German Bight / Humber
   - Wind: Variable, becoming east or southeast 3 or 4
   - Sea State: Slight
   - Weather: Fog patches clearing
   - Visibility: Moderate or good, occasionally very poor
4. Thames / Dover / Wight / Portland / Plymouth
   - Wind: East or northeast veering east or southeast 3 or 4, occasionally 5
   - Sea State: Slight
   - Weather: Showers
   - Visibility: Moderate or good, occasionally poor
5. Biscay
   - Wind: Cyclonic 3 or 4 in southwest, otherwise easterly or southeasterly 4 or 5
   - Sea State: Moderate
   - Weather: In north, mainly fair. In south, thundery showers, fog patches in soutwest
   - Visibility: Moderate or good, occasionally very poor in southwest
6. FitzRoy / West Sole
   - Wind: Cyclonic or variable 3 or 4, occasionally 5 later, but becoming northwesterly 5 to 7 in far west later
   - Sea State: Moderate or rough

- Weather: Rain or thundery showers, fog patches
- Visibility: Moderate or good, occasionally very poor

7. East Sole / Lundy / Fastnet / Irish Sea / Shannon
   - Wind: Easterly or northeasterly veering southeasterly 3 or 4, occasionally 5 later
   - Sea State: Slight or moderate
   - Weather: Showers
   - Visibility: Moderate or good, occasionally poor
8. Rockall / Malin
   - Wind: Variable 3 or 4 becoming southeasterly 4 or 5, occasionally 6
   - Sea State: Moderate or rough
   - Weather: Occasional rain or showers
   - Visibility: Moderate or good, occasionally very poor
9. Hebrides / Bailey / Fair Isle / Faeroes
   - Wind: Southwest backing southeast 4 or 5, occasionally 6, decreasing 3 for a time
   - Sea State: Moderate or rough
   - Weather: Showers, fog patches
   - Visibility: Moderate or good, occasionally very poor
10. Southeast Iceland
    - Wind: Southwesterly backing southeasterly 5 or 6, decreasing 4 for a time
    - Sea State: Rough
    - Weather: Showers, rain in west later
    - Visibility: Moderate or good

12-13. Section 2, Exercise III(a) ***NOAA forecasts*** (key) (page 204)

For the 1st clip [SYNOPSIS FOR CALIFORNIA & ARIZONA]:
What weather is expected?
a) dry weather, clear skies, temperatures a bit above normal, with a slight chance of showers, thunderstorms and cooler temperatures over portions of the area
For the 2nd clip [LAKE ONTARIO]:

- What area is the forecast for? LAKE ONTARIO, from Great Lakes, USA

Correct phrases:
1. a. Gale warning
2. b. Today, NE winds 15-20 knots increasing to 30 knots late this morning
3. a. Tonight north gale 35 knots diminishing to 30 knots
4. a. Rain in the evening
5. b. Chance of rain and showers in the afternoon
6. b. Waves 5-7 feet subsiding to 3-5 feet

Unit 10: Past voyages and sea passages

14. Section 2, Exercise I(b) ***An event which happened during a sea passag***e (page 216)

Last year I was the Chief Officer on an oil tanker, the Hope, and we sailed the route from the Black Sea to the Persian Gulf through the Suez Canal. We carried crude oil. On April 28, we were underway in the Gulf of Aden (120 nm off the coast of Oman) when pirates tried to board the ship! They came with a speedboat and they were armed. Fortunately a vessel from the EU Naval Force was in the area and the pirates backed off. We heard on the radio that they hijacked another vessel on that same day! This is definitely one of the most dangerous shipping lanes in the world.

15. Section 2, Exercise II(d) ***Reporting an incident from a past voyage: Jettisoning (Deck log book entry)*** (page 218)

The incident happened two months ago. I was the Master of MV Cannibal. The cargo was timber. We were sailing off the coast of Taiwan heading for Shanghai. There was a near gale with moderate visibility. We noticed that the vessel was listing heavily to port. After making the necessary stability calculations, I decided to jettison cargo. I informed the owners and charterers and we jettisoned about 200 cubic metres of deck cargo. The vessel regained its stability and we proceeded with our voyage. I wrote an initial incident report and sent it to the owners according to the vessel's Safety Management System.

Review 2

16. Section 2, Exercise A ***Emergency situation: Fire*** (page 225)

Fires and explosions are very serious accidents.
However, ships can be protected if they are constructed according to international regulations. Specifically, ships should

be internally subdivided by fire-retarding bulkheads and decks. They should be further equipped with means of escape and with automatic sprinklers and portable or fixed extinguisher systems to contain and extinguish a fire, anywhere on board it may start. And of course, the crew should be regularly exercised with fire drills.
To prevent a fire from breaking out, three factors are very important; cleanliness, suitable cargo stowage and proper ventilation throughout the period of the voyage.
A fire can be brought under control with prompt action. Early detection of the fire in the zone of origin and immediate sounding of the alarm is paramount. That is why it is necessary that the detection system should be kept in good order and fire patrol be maintained.

17. Section 5, Listening ***Satellite Radar: Looking into the oceans.*** (Key) (page 230)

Correct order:
1. The Satellite Radar can measure ocean currents from space, offering information on the circulation of water and heat transfer around the globe.
2. The first series of radar satellite, called Poseidon, was the first to offer a glimpse of El Niño, and its catastrophic temperature shifts.
3. The new series of radar satellites is called Jason.
4. Global climate change is visible through the satellite, making apparent the melting of polar ice and the rising temperatures.
5. With ocean imaging technology, scientists try to predict climate change for a time span of 10, 20, or even more years.

18. Section 6, Exercise A ***What are tides?*** (page 230)

Today's question is….What are tides?

Tides are basically very long-period waves that move through the oceans in response to the forces exerted by the moon and the sun. Tides begin in the oceans and then move towards the coast where they appear as the regular rise and fall of the sea surface.

To help us dive a little deeper into this question, we will talk with Steve Gill on tides – what they are, what causes them, and the factors that affect them. Steve is the Senior Scientist with the Center for Operational Oceanographic Products and Services. Hi Steve, welcome to our show.

STEVE GILL: Hi Kate, thanks, it's good to be here to talk about a topic that I have studied and worked on for over 33 years. Much of the practical application of tides is something that comes from on-the-job training and not learned in text books, so what the NOAA Tides and Currents program does is fairly unique.
HOST: Steve, first, ***what is the difference between a tide and a current?***
STEVE GILL: Well, Kate, that's a good question and typically the first thing I cover in many of my talks with students. The word "tides" is a general term used to define the alternating rise and fall in sea level with respect to the land. So, tides are characterized by water moving up and down during the day. Currents on the other hand move horizontally rather than vertically. Currents describe the horizontal motion of the water and are driven by several factors, one of those is tides; another is the wind. The horizontal movement of water that accompanies the rising and falling of the daily tides is called the tidal current.
HOST: Thanks Steve, so basically tides move up and down and currents move back and forth. ***What causes tides?***
STEVE GILL: Gravity is one of the major forces that causes tides. Tides are caused by the gravitational pull of the moon and the sun. The gravitational forces are counterbalanced by the outward force of inertia from the moon revolving around the Earth and Earth revolving around the sun in their orbital paths. The combination of these two forces results in the tide-producing forces. So, ocean tides are a combination of lunar tides (lunar meaning the moon) and solar tides (solar meaning the sun).
HOST: Steve, ***what is the difference between high tide and low tide?***
STEVE GILL: When the highest part, or crest, of the tide wave reaches a particular location, high tide occurs; low tide is the lowest part of the tide wave or trough. The difference between high tide and low tide is called the tidal range. Most people experience this difference when they are walking along the beach and perhaps notice either more or less beach area for a place to stop, sit down, or rest. I know my children would have fun building a series of sand castles further and further up the beach throughout the day as the tide came in and washed them out. Tides on all coasts originate in the oceans and travel onto shore and up into the estuaries, bays, and rivers.
HOST: So Steve, ***why do we study tides?***
STEVE GILL: Well, we study tides for a variety of reasons. If we know the times, heights, and extents of both the inflow and outflow of the tidal waters we can better navigate through the intracoastal waterways and within the estuaries, bays, harbors; and we can work on harbor engineering projects such as the construction of bridges and docks; and we can collect data critical to fishing, boating, surfing, and many other water-related sports. We put in tide stations to measure the tides and analyze the data so that we can predict the tides and publish tide tables. And this is just to name a few of the ways that we use tidal data to help us in our daily lives.

Part Three

Audio • CD tracks

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Unit 11: Incidents and accidents at sea

1. Section 1, Exercise (a) ***Collision in the North Sea*** (page 238)

Damage from a collision in the North Sea. A Greek tanker carrying jet fuel collided with a Cypriot container ship some 30 km off the Dutch coast Tuesday. The cause of the collision is still unknown. A Port of Rotterdam spokesman said the container ship had been en route to Rotterdam from St. Petersburg. The damaged tanker, the Mindoro, leaked jet fuel from a hole above the waterline but the coast guard says the leak was quickly contained. The North Sea is home to some of the world's busiest shipping lanes, Rotterdam is one of Europe's biggest ports but authorities are expecting no delays as a result of the accident.

["Collision in the North Sea", Oct 12, 2010, Deborah Lutterbeck, Reuters]

2. Section 2, Exercise I(b) ***IMO Reports on Marine Casualties and Incidents: Classification of Ship Casualties*** (page 241)

(MSC-MEPC.3/Circ.3, December 2008)
For the purpose of reporting information to the International Maritime Organisation, ship casualties are classified as "very serious casualties", "serious casualties", "less serious casualties" and "marine incidents".
"Very serious casualties", according to the definition given by the IMO, are casualties to ships which involve total loss of the ship, loss of life, or severe pollution.
"Serious casualties" are casualties to ships which do not qualify as "very serious casualties" and which involve a fire, explosion, collision, grounding, contact, heavy weather damage, ice damage, hull cracking or suspected hull defect, resulting in:

1. immobilization of main engines, extensive accommodation damage, severe structural damage, such as penetration of the hull under water, etc., rendering the ship unfit to proceed,
2. pollution (regardless of quantity),
3. a breakdown necessitating towage or shore assistance.

[Three news reports on the same marine accident (tracks 3, 4, 5)]

3. Section 3, Exercise D, Story 1 ***Grounded cargo ship threatens NZ environmental disaster.*** (Thu 13 Oct, 2011) (page 249)

Eight days after running aground on a reef off the coast of New Zealand, a stricken cargo ship threatens the country's worst maritime environmental disaster. The Rena 12 has been leaking toxic fuel into the sea since becoming stuck here more than a week ago. Now salvage experts say the stricken vessel could break in half. The salvage crews are busy wor-king on safely pumping out the oil and steadying the ship to keep it from breaking in two and sinking. Large splits have opened in the middle of the hull, making the operation tougher for rescue teams. MARITIME NEW ZEALAND SALVAGE EXPERT BRUCE ANDERSON, SAYING: "We already had a complex project to start with. It's even harder now that we've sustained damage on board this vessel. So what was tough is going to be tougher, but we've got the best salvage crew you can ever find in the world to get on board and start these things going." Three hundred tonnes of thick toxic fuel has already washed up on one pristine coast of Tauranga, in the middle of the Pacific country's North Island. Other cargo and debris have also reached land, but volunteers and soldiers are working hard to clear the beaches. The Greek owners of the vessel have offered an unreserved apology for the accident, while the ship's

captain and second officer have been charged with operating a vessel in a manner causing unnecessary damage or risk. (Simon Hanna, Reuters.)

4. Section 3, Exercise D, Story 2 ***Bad Weather Halts Cargo Ship Salvage (Tue 18 Oct, 2011)*** (page 249)

Rough seas force the salvage crew to leave this cargo ship grounded off the New Zealand coast. 350 tonnes of toxic fuel have already leaked in the country's worst maritime environmental disaster in decades. And bad weather is adding to the problem. The authorities fear the stern, which contains more than 1,000 tonnes of oil, may break away from the rest of the ship. NEW ZEALAND TRANSPORT MINISTER, STEVEN JOYCE, SAYING: "We're in quite a critical phase for that ship over the next, probably, 24 hours, because of the weather conditions." The vessel's captain is due in court on Wednesday on charges of operating a ship in a dangerous manner. (Lily Grimes, Reuters)

5. Section 3, Exercise D, Story 3 ***Containers removed from stricken ship off New Zealand coast (Thu Nov 17, 2011)*** (page 249)

The delicate and painstaking task of removing cargo containers from the stricken ship 'Rena' - grounded off the coast of New Zealand - enters its second day. Workers must cut each of them free from the stack, then attach cables so the containers can be lifted by a crane onto a nearby barge. Eighteen have so far been removed from the vessel but work is expected to slow once the salvors reach the full ones. SALVAGE MANAGER, MARITIME NEW ZEALAND, KENNY CRAWFORD, SAYING: "These are empty containers. There's no real weight in them. The weather conditions are just about perfect for this operation." And if wind speeds exceed 24 knots, the work must stop for safety reasons. SALVAGE MANAGER, MARITIME NEW ZEALAND, KENNY CRAWFORD, SAYING: "Ultimately, the salvors' safety is paramount here as well. So they don't want to be underneath a container that's going to fall apart on them." Of the 1,200 containers, about 800 are situated below deck. Workers have said they may have to cut the ship open to reach them. (Travis Brecher, Reuters)

Unit 12: I require medical assistance

6. Section 1, Exercise I(b) ***Injured crewmember – Medical officer dialogue*** (page 258)

Medical Officer:	Come in! What's the problem?
Crewmember:	I think I broke my hand! It hurts a lot!
Medical Officer:	Let's see. It looks bruised. But we need an X-ray to see if it's a strain or a fracture. How did it happen?
Crewmember:	I fell off the accommodation ladder, it wasn't rigged properly. I landed on my hands and feet.
Medical Officer:	Did you have your safety boots on?
Crewmember:	Oh, yes! I was wearing my safety boots and my hard hat.
Medical Officer:	Good for you! Otherwise it would have been much worse. Take the rest of the day off. The other second officer will replace you on your watch. If the pain is unbearable, take these painkillers. I will arrange for an agent to escort you to the local hospital as soon as possible. Now, we need to apply a splint to your arm, to keep it still.

7. Section 2, Exercise I(c) ***First aid advice – BURNS [the "gist" of the advice given]*** (page 264)

Remove the victim and yourself from the source of the burn; if the victim's clothes are still burning, sprinkle with water or roll the victim to the ground. Cool the burn down. Pour large amounts of water for at least 10 minutes over the burn. Explain what you're doing to the casualty, reassure them and make them comfortable. Remove any jewellery such as rings and watches. Remove any clothing around the burned area unless it is directly over the burn or stuck to the skin. Do not put any creams, oils or lotions onto the burn. Loosely cover the burn to protect it from infection; do not wrap the wound up tightly, do not encircle the wound with the covering.

8. Section 2, Exercise II(a) ***First aid kit contents*** (page 266)

Key: The only items not included in the First Aid Kit are: eye wash, burn wrap, synthetic gloves.

9. Section 2, Exercise III(c) clip (i) ***First aid advice – UNCONSCIOUS BUT BREATHING [the "gist" of the advice given]*** (page 270)

Place victim on their side to protect their breathing. Do not move the victim if you suspect they've hurt their back or neck, unless their breathing is noisy and their mouth is blocked with blood or vomit. If you do so, try to keep their head in alignment with their neck. When victim is on their side, check for signs of circulation, i.e. coughing, movement and normal breathing. Check for a pulse at the neck. If the victim is bleeding, press firmly on the wound. Continue to check that the victim is breathing normally every minute or so. This is the most important thing to remember.

10. Section 2, Exercise III(c) clip (ii) ***CPR for adults*** (page 271)

Key: 30 chest compressions / 2 breaths.

11. Section 3, Exercise I ***Injured seafarers*** (page 278)

1. I strained my ankle. I was painting the funnel and I was on the scaffold; I fell off the scaffold and landed on my ankle. Luckily I was wearing a safety harness.
2. I have burned my hands. I was in the engine room. A pipe leaked and some hot oil spilled on me. I didn't have my gloves on, and even though I washed by hands immediately with lots of cold water, I have some pretty bad burns.
3. I cut my finger. I was using the chisel and it slipped from my hand so I cut my finger. Luckily I had my gloves on so the cut is not too deep.

12. Section 5, Exercise D ***Occupational Safety Announcement*** (page 282)

Attention! Entering the main deck of the vessel is dangerous due to storm. Make use of handrails and lifelines on deck and in corridors. Secure all loose objects in your cabins.

Unit 13: Call the watch engineer

13. Section 1, Lead in ***Pre- Bunkering: the Chief Officer reports to the Master before bunkering starts*** (page 286)

We are ready for bunkering. We will take on 400 tonnes of bunker fuel. I have checked the "before bunkering" part of the procedure checklist. The bunker barge is now safely alongside. We have secured all moorings and we have put the fen-ders in position. We have rigged the accommodation ladder. The main engine is on stand-by, we have put the drip trays in position, and we just finished sounding the tanks.

14. Section 1, Exercise I(c) ***Vessel procedures: Bunkering – Responsibility (***page 287)

The Chief Engineer is responsible for bunkering operations as well as bunk lubricants supply operation and upon completion, for handling records.

The Master is responsible for securing the vessel during bunkering operations and that all appropriate signals are shown.

Assigned crew duties are as follows:

- Chief Engineer: Supervising the whole process
- Second Engineer: Valve handling (Engine Room)
- Third Engineer: Tank soundings
- Chief Officer: Supervising deck operations
- Second Officer: Tending mooring lines

Also, one A.B as watchstander at bunker header and one for a Deck-Rover watch. The "Deck-Rover" watch primary duty is monitoring for oil spills on deck and over the side during bunkering, visually inspecting the water near or opposite all bunker tanks, and being in position to view spillage on deck or in water during tank change over and topping off.

15. Section 3, Exercise I(a) ***Mooring Line Care and Maintenance*** (page 299)

There are serious accidents that happen to crewmembers when damaged or worn mooring ropes part and strike those standing by in the vicinity. Apart from a visual inspection by crew prior to berthing and periodic inspections by the watch-man while alongside, mooring rope and mooring wire should be periodically inspected along their entire length at least once a month. The wear along the rope should be externally examined. Mooring ropes should be cropped once the wor-king end becomes worn. If there is any doubt as to the strength or integrity of a rope then it should be replaced. If the moo-ring wire is worn such that the diameter has decreased then it should be discarded. In order to ensure that ropes remain in satisfactory condition and free of damage the following points should be borne in mind by crewmembers.
Fibre ropes should not be left exposed to sunlight while at sea; they should either be covered or stored below deck.
Wire ropes are to be periodically dressed with an appropriate grease to help maintain their condition.

Unit 14: PLS ADV ASAP

16. Section 5, Exercise II(a) ***City University, London, Professor John Carlton introduces the MSc Maritime Opera-tions and Management course. (Key)*** (page 329)

Full-time course – duration: 1 year
Part-time course – duration: up to 5 years
You can come with an undergraduate degree in subjects like:
Law, Science, Engineering, Accountancy, Management

If you come from the sea, you need a Class 1 Certificate with some years of experience as Master or Chief Engineer.
1st term
(compulsory modules)
Operations, Technology, Law, Management, Accountancy and Finance
Note: exams after Christmas
2nd term
(optional modules)
Off-shore Engineering, Environment, Marketing, Security, Risk Management, Ship Design
Final term
Dissertation
Note: viva

Unit 15: I read you good

17. Section 1, Exercise G ***The Estonia disaster: the Mayday call*** (page 337)

Estonia:	**Europa, Estonia, Silja Europa, Estonia.**
Silja Europa:	**Estonia, this is Silja Europa replying on channel 16.**
Estonia:	**Silja Europa.**
Silja Europa:	**Estonia, this is Silja Europa on channel 16.**
Estonia:	**Silja Europa, Viking Estonia.**
Silja Europa:	**Estonia, Estonia.**
Estonia:	**Mayday Mayday.**
Estonia:	**Silja Europa, Estonia.**
Silja Europa:	**Estonia, Silja Europa, are you… calling Mayday?**
Silja Europa:	**Estonia, What's going on? Can you reply?**
Estonia:	**This is Estonia**, *(in Finnish) who is there?*
Estonia:	**Silja Europa, Estonia!**
Silja Europa:	**Yes, Estonia, this is Silja Europa.**
Estonia:	*(in Finnish) Good Morning. Do you speak Finnish?*
Silja Europa:	*(in Finnish) Yes, I speak Finnish.*
Estonia:	*(in Finnish) Yes, we have a problem here now, a heavy list to starboard side. I believe that it is 20, 30 degrees. Can you come to our assistance and also ask Viking line to come to our assistance?*

18. Section 3, Exercise C ***VHF communication*** (page 341)

SANTOS PORT CONTROL, SANTOS PORT CONTROL **THIS IS DORIS LIMA ALFA GOLF FIVE, DORIS LIMA ALFA GOLF FIVE** **ON CHANNEL ONE-FOUR** **OVER**
DORIS LIMA ALFA GOLF FIVE **THIS IS SANTOS PORT CONTROL, SANTOS PORT CONTROL** **ON VHF CHANNEL ONE-FOUR** **GO AHEAD** **OVER**
SANTOS PORT CONTROL, SANTOS PORT CONTROL, THIS IS DORIS **REQUEST: I REQUIRE PERMISSION TO ENTER TRAFFIC LANE** **OVER**

DORIS, THIS IS SANTOS PORT CONTROL **INFORMATION: YOU HAVE PERMISSION TO ENTER TRAFFIC LANE AT 0900 UTC** **INSTRUCTION: ENTER INWARD TRAFFIC LANE FROM SOUTH EAST** **OVER**
SANTOS PORT CONTROL, THIS IS DORIS **MESSAGE UNDERSTOOD: I WILL ENTER TRAFFIC LANE FROM SOUTH EAST AT 0900** **QUESTION: WHAT IS MY BERTH NUMBER?** **OVER**
DORIS, SANTOS PORT CONTROL **ANSWER: YOUR BERTH NUMBER IS SEVEN-BRAVO** **REPEAT, YOU HAVE TRAFFIC CLEARANCE TO PROCEED TO BERTH NUMBER SEVEN-BRAVO** **OVER**
SANTOS PORT CONTROL, THIS IS DORIS **MESSAGE RECEIVED. THANK YOU VERY MUCH** **STANDING BY ON CHANNELS ONE-FOUR, ONE-SIX** **OVER AND OUT**

19. Section 5, Exercise A ***Piraeus Traffic – Routine Exchange*** (page 353)

Piraeus Traffic, Piraeus Traffic, Pacific Spirit, Good morning sir.
Pacific Spirit, Piraeus Traffic.
Now I am entering the northbound lane.
Ok, sir, call us back at the north exit of TSS.
Roger that. I will call you at the north exit of the TSS. Thank you. Standing by at 14 and 16.

Piraeus Traffic, Piraeus Traffic, Pacific Spirit.
Pacific Spirit, (from) Piraeus Traffic.
I am leaving the North exit of the northbound lane.
Ok, 3 miles distance of the yellow buoy, call Pilot Station on channel 12 and call us back.
Ok, sir, 3 miles from the Pilot Station I will call the Pilot and I will inform you also.

Pacific Spirit, Pacific Spirit, do you read me?
Piraeus Traffic, Pacific Spirit.
Pacific Spirit, Piraeus Traffic.
I am now 3 miles from the yellow buoy.
Have you contacted with the Pilot Station?
Yes, sir. We informed the Pilot and they instructed us to proceed and they will board us near the yellow buoy.
Ok, sir. Proceed to SW of the yellow buoy, approximately one mile distance, stop your vessel and wait for pilot embarkation.
Ok, sir. We will wait for the pilot one mile from the buoy.

20. Section 5, Exercise B ***Station calling Piraeus Traffic*** (page 353)

We left Zea Marina and we are sailing for … shipyard at Perama. Over.
Ok, proceed.
Pay attention to the main entrance of Piraeus.
Roger that, sir. Thank you very much. Standing by 13,14.

21. Section 5, Exercise C ***(one-sided communication; messages sent to Piraeus Traffic)*** (page 353)

Good morning to you… talking on the bridge. I would like to ask you for permission to lower our rescue boat for testing. The rescue boat for testing only. We'll be careful. We just want to check that everything works fine. Thank you for your permission. I'll let you know when I finish with testing. Thank you very much. Standing by 14, 12 and 16.

22. Round-up, Exercise E ***Minor accident*** (page 356)

A: Hey, how are you? I heard you had an accident. How are you feeling?
B: Yeah, I had an accident, but fortunately it wasn't serious. I'm fine. I was painting outside the accommodation and while I was climbing up the ladder I lost my footing and fell. I got away with a few bruises. A crewmember was there to help me. He was passing by as I was lying on deck, and he helped me up.
A: Well, these things happen but you have to be extra careful!
B: Yes, I know. Good thing I had my safety boots and my helmet on.

Review 3

23. Section 1, Exercise A ***Maritime Accident*** (page 358)

On terra firma - finally. Hundreds of vacationers land safely in Italy, hours after their cruise ship ran aground and capsized in the Mediterranean Sea, killing at least three. With teary eyes, they step off a ferry after being plucked from the stricken Costa Concordia on Saturday. The 290-metre long ship ran into a sandbar near the island of Giglio, before tipping over onto its side. One passenger described the scene. PASSENGER OF CRUISE SHIP "COSTA CONCORDIA" SAYING: "We had a blackout and everybody was just screaming. All the passengers were running up and down and then we went to our cabins to learn what was goIng on and then they said that we should stay calm - it is nothing it is just some electric problem or just some blackout thing." Rescuers are still searching the chilly waters around the island. The cruise ship was carrying around 4,000 people and had just embarked on a winter Mediterranean cruise. The cause of the accident is still being investigated. (Andrew Raven, Reuters)

24. Section 1, Exercise B ***Maritime Accident (II)*** (page 358)

A helicopter comes to the rescue of a crew member trapped on a capsized ship off Italy's west coast. After 37 hours on board the Costa Concordia, Manrico Gianpetroni is airlifted to safety on a stretcher. Rescuers earlier made radio contact with the chief purser, who has a broken leg. They are still searching for the 40 others missing since the cruise ship ran aground Friday, killing at least three. Cruise operators say the ship was on its regular course when it struck a rock. Officials are concerned the ship's fuel could pollute the water, but so far there has been no sign of a leak. (Lindsey Parietti, Reuters)

Appendix I: English for Marine Engineers

25. Part One, Section 3, Exercise D ***MAN Diesel Engine*** (page 398)

26. Part Two, Section 1, Exercise II(A) ***Diesel Engine Components*** (page 400)

27. Part Two, Section 1, Exercise III(A) ***The 4-stroke and 2-stroke cycles*** (page 404)

28. Part Two, Section 1, Exercise III(H) ***Diesel process by WÄRTSILÄ*** (page 408)

In the diesel process, liquid fuel is injected into the cylinder at high pressure by camshaft-operated pumps. The fuel is ignited due to the high temperature resulting from the compression.

Combustion takes place under constant pressure with fuel injected into the cylinder during combustion. After the working phase, the exhaust gas valves open and the cylinder is emptied of exhaust gases. With the piston in its upper position, the inlet valves open just before the exhaust gas valves close, and the cylinder is filled with air. In Wärtsilä engines the inlet valves close just before the piston reaches the bottom dead centre. This method, called "Miller timing", reduces the work of compression and the combustion temperature, which results in higher engine efficiency and lower emissions.

29. Part Two, Section 6, Exercise (a) ***Identifying visitors on board*** (page 441)

A: Did you see the superintendent this morning? We were expecting him for a briefing on the company's Safety Management policy.
B: Yes, he came on board at 10.00 hours. The agent was with him.
A: Right, I saw two visitors around that time. Who was who? What does the superintendent look like? What is he wearing?
B: The superintendent is well-built, he has a beard and is bald. He's wearing a black jacket. The agent is quite thin and has short grey hair. They are both in their 50s. I actually know the superintendent. We studied together in the Academy.
A: What is he like?
B: He is very hard-working and serious. But he is quite easy going.

30. Part Three, Section 1, Exercise B ***Steps in a High Seas Bunkering Procedure (key)*** (page 450)

i.

1. Securing supply tanker alongside the vessel.
2. Using the ship's crane to hoist the bunker hose.
3. Vessel's deck crew opening the manifold.
4. Connecting bunker hose to manifold.
5. Attaching bottle for drip sampling in the supply tanker.
6. Pumping starts.
7. Vessel drip sampling for quality control.

ii.

1. An adequate number of Yokohama fenders are placed on the supply tanker depending on weather conditions.
2. After the manifold is opened, the supplier hands over the emergency stop button to the vessel.
3. Samples are sealed for later verification of supplied product quality in case a dispute arises.
4. The pumping rate is up to 600 m^3/h.
5. There is communication between the crews about pumping speed.
6. The supply tankers are double-hulled, state of the art tankers.

31. Part Three, Section 2, Exercise I(A) ***Lubrication*** (page 467)

The main task of lubrication is to reduce friction between the moving parts of an engine. In this way we ensure better performance of the engine and reduction of wear due to friction. Lubrication also acts as a cooling means of the metal surfaces because it absorbs a considerable amount of heat which is released from friction.

Furthermore, it assists the piston rings in sealing the combustion chamber.

Moreover, it protects the surfaces from corrosion, even when the engine is out of running, thanks to the good tenacity lubricants have on metal.

Finally, it keeps the metal surfaces clean due to the antifouling property of lubricating oil.

Correct lubrication of the engine is of great importance because inadequate lubrication would lead to the seizing of bearings and sticking of the engine.

The correct choice of lubricating oil is essential too and we should always consult the engine constructor's manual as to the recommended type of oil for the particular engine.

The types of lubricating oils used in marine diesel engines are generally mineral oils, coming from the residues (base stock) of crude oil after its distillation. These mineral oils are fortified with chemicals (additives) which enhance their functional properties that the engine requires.

32. Part Three, Section 3, Exercise I(F) ***Briefing on ME overhauling*** (page 480)

Shipowner: Well, how is overhauling of the "Seafarer" going?

C/E: We have almost finished overhauling the Main Engine.

S: Fine! Could you give me some details on the works carried out?

C/E: Certainly. Well the **cylinders** and **pistons** were examined and found in pretty good condition but the **piston rings** were in bad condition and we replaced them.
The **cylinder heads** were also in good condition with no signs of metal fatigue. We only removed some scale in the water passages around the valves. The **valve seats** were found to have scratches and pittings and we regrounded them. The **cylinder liner** was measured for wear but it was within permissible limits.

S: Well, the engine seems to have been well maintained, no big damages whatsoever. What about the crankshaft and main bearings?

C/E: We aligned the **crankshaft** and measured the wear down of main **bearings**. No 1 and 2 main bearings had signs of overheating and a wear down of 0.050 inches. We reconditioned them and we also cleaned the **crankcase** and retightened the screwed connections.

S: Good! What about the fuel pumps?

C/E: All pumps were found in good order. The atomizers and filters, however, were found very dirty. We cleaned them with paraffin. We also plugged two pipes which appeared to be leaking. That's all. We haven't examined the boilers and auxiliaries yet.

S: Thank you for the briefing. We'll talk again later.

APPENDIX IV
Nautical Chart Symbols

Cultural Features

- Airport
- Church
- Tower
- Motorway
- Road
- Railway with station

Offshore Installations

- Limit of Safety Zone around off shore installation
- Oil, Gas pipeline
- Submarine Cable
- Well / Submerged Production Well
- Oil, Gas installation Buoy
- Production Platform, Oil

Services

- Pilots

Nature of the Seabed

- Spring in seabed

Lights - Buoys - Marks

- Light
- Light bouys
- Mooring buoy
- Isolated Danger Mark (stationed over dangers with navigable water around them)

Wrecks, Obstructions

- Wreck showing any portion of hull or superstructure at level of chart datum
- Dangerous wreck, depth unknown
- Sunken wreck, not dangerous to surface navigation
- Obstruction

Areas, Limits

- Limit of restricted area
- Anchorage
- Anchoring prohibited
- International maritime boundary

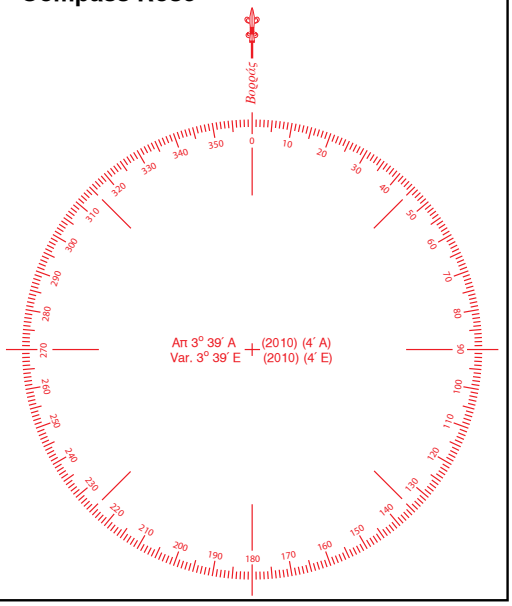
Tracks, Routes

- Established (mandatory) direction of traffic flow
- Recommended direction of traffic flow
- Separation line
- Separation zone

Natural Features

- Sandy shore
- Steep coast / steep coast with rock cliffs

Compass Rose



APPENDIX V
Grammar

1. Present Continuous (Progressive)

Look at these examples:

- It isn't raining now. We can go outside.
- Are you doing anything tonight?
- What are you cooking?
- What classes are you taking this semester?
- I'm meeting the crew manager tomorrow morning.
- We're repairing the ship in the dry-dock yard these days.

We use the Present Continuous tense for

- actions happening at the present moment
- planned future events (usually in the near future, e.g. this evening, next week, etc.)
- actions or events happening around the present moment

Structure → **to be (am / is / are) + verb –ing**

Positive Form

I **am** (I'm) You **are** (You're) He, She, It **is** (He's, She's, It's) We, You, They **are** (We're, You're, They're)	eat**ing** lunch	now.

Negative Form

I am **not** (I'm not) You are **not** (You aren't) He, She, It is **not** (He, She, It isn't) We, You, They are **not** (We, You, They aren't)	com**ing**	this evening.

Question Form

Am **Are** **Is**	I you / we / they he / she / it	talk**ing** too fast? listen**ing** to me?

Note the spelling of the **-ing form of the verbs:

work	work**ing**
come	com**ing**
stop	stop**ping**
die	d**ying**

** Note the verbs that are not used in the continuous forms:

Some verbs express an action, something a person does:	Some verbs express a "state" and cannot be used in the continuous forms:
• He **is cooking** dinner at the moment: The Present Continuous is used only with action verbs: I am working right now. *NOT* ~~I am believing you~~.	• I **want** to travel around the world Common verbs **not** used in the continuous forms: *believe, understand, think (expressing opinion), want, hope, smell, taste, feel, sound, look, seem, appear, etc.*

2. Present Simple

The 2nd Mate **usually stands** a navigational watch.
The Captain **does not stand** a watch.
Does the Chief Engineer usually **work** during the day?
Does the Bosun **supervise** all A/Bs? Yes, **he does**.
The quartermaster **keeps** a lookout for other vessels and **steers** the ship in and out of port.
The Captain **pays** the crew.
I **don't usually go out** on Friday night.
I **live** in Southampton.
The chief steward **speaks** German and Spanish.
Does he smoke many cigarettes every day? Yes, **he does**./No, **he doesn't**.
Do you agree with the new anti-smoking regulations?
Do you like your studies? Yes, **I do**.
Do you worry about the future? No, **I don't**.

We use the Simple Present
(1) when we speak of habits and daily routines (what we do sometimes, often, always, every day, usually, never etc.) or
(2) when we speak about something permanent (where we live; what languages we speak; what we like, dislike, love, hate, know, understand etc.).

Structure:

I	live	in Preveza	We	live	in Preveza
You	live		You	live	
He / she / it	live**s**		They	live	

I	watch	a lot of TV	We	watch	a lot of TV
You	watch		You	watch	
He / she / it	watch**es**		They	watch	

*Note: the ending –s or –es in the 3rd person singular, e.g. wash**es**, manage**s**; kiss**es**.
–es after –s/ -ch/ -sh: pass ⇒ pass**es**, watch ⇒ watch**es**, finish ⇒ finish**es**
also: do ⇒ do**es**, go ⇒ go**es**
study ⇒ stud**ies**, carry ⇒ carr**ies**.

Questions and Negative Sentences

Where **do** you **work**? I work in an office.
When **do** you **start**? I start work at nine.
When **do** you **finish**? I finish at four.
Do you like your work? No**, I don't**.
Jim work**s** in an office. He start**s** work at nine and he finish**es** at four.
He **doesn't like** his work.

Where	do / does Do / Does	you / he you, she, it, they	work? work	 in an office?

I You He / she / it We You They	do not (don't) does not (doesn't) do not (don't) 	live	in England

*Note: **no** –es ending in questions.
no –es ending in negative sentences.

3. Present Simple vs. Present Continuous

Look at the time graphs and the examples to compare the use of Present Simple and Present Continuous.

Present Continuous

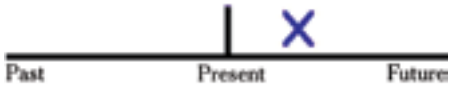
USE 1: Now (this second, at this very moment)

Examples: What *are you doing*? *Are* you *sleeping*? Why *aren't* you *doing* your homework?

USE 2: Longer Actions in Progress Now

Examples: (You say, while having coffee with a friend) "*Are* you *working* on any special projects at work?" "Yes, we *are preparing* the new year's financial proposal."

USE 3: Near Future



Examples: I *am meeting* some friends after work. *Is* he *visiting* his parents next weekend?

Simple Present

USE 1: Repeated Actions

Examples: *Does* he *play* tennis? She always *forgets* her keys.

USE 2: Facts or Generalization

Examples: Cats *like* milk. Birds *do not like* milk.

** Note other uses of these tenses:

We use the Present Continuous to express	We use the Simple Present for
Repetition and Irritation with «always»	**Scheduled Events in the Near Future**
• I don't like him because he **is always complaining.**	• The ship **does not arrive** at 11 am, it **arrives** at 11 pm.

** Note **where we place adverbs** such as: *always, only, never, ever, still, just, etc.*

- You are **still** watching TV.
- Are you **still** watching TV?
- You **only** speak English.
- Do you **only** speak English?

4. Comparative and Superlative adjectives

Look at these examples:

The Atlantic Pioneer is **longer than** the British Emerald.
The British Emerald is **older than** the Oberon.
The DFDE engine is **more effective**.

- "long**er**", "old**er**" and "**more** effective" are ***comparative*** forms
- the comparative form is formed with **–er** or **more**…
- after comparatives you can use **than**

Spelling

In general, we use "**–er**" for short adjectives and "**more**…" for longer ones.

e.g. long ➔ longer
difficult ➔ more difficult

- wide → wid**er** [if the adjective ends in **–e**, simply add **–r**]

- heavy → heav**ier** [if the adjective ends in **–y**, change the **–y** to **–i** and add **–er**]
- big → big**ger** [if an adjective ends in a consonant + vowel + consonant before **–er**, the consonant at the end is "doubled"]

These adjectives have irregular comparative forms:

good → better *e.g. The new engine has a **better** performance record than the old one.*

bad → worse *e.g. Is your health better? No, I'm afraid it's **worse**.*

far → further (or farther) *e.g. It's a long drive from here to the port, **further** than I thought.*

Look at these examples:

The Atlantic Pioneer is **the longest** ship of the three.
The British Emerald is one of **the largest** LNG Carriers in the world.
The shipyard is one **of the most reliable** of its kind.

- "long**est**", "larg**est**" and "**most** reliable" are ***superlative*** forms
- the superlative form is formed with **–est** or **most**…
- we normally use **the** before a superlative

Spelling

In general, we use "**–est**" for short adjectives and "**most**…" for longer ones.

e.g. long ➔ longer
difficult ➔ more difficult

- wide ➔ wid**est** [if the adjective ends in **–e**, simply add **–st**]
- heavy ➔ heav**iest** [if the adjective ends in **–y**, change the **–y** to **–i** and add **–est**]
- big ➔ big**gest** [If an adjective ends in a consonant + vowel + consonant before **–est**, the consonant at the end is "doubled"]

These adjectives have irregular superlative forms:

good ➔ best *e.g. Tom is the **best** Chief Engineer I've ever worked with.*

bad ➔ worst *e.g. What was the **worst** day of your life?*

far ➔ furthest *e.g. What is the **furthest** point humans have travelled in space?*

5. "Will"/ "be going to" in weather forecasts

Look at the following phrases, taken from weather forecasts:

Melbourne **is going to** be dry.
Showers **will** break out later in the evening.

We use both "going to" and "will" for weather forecast.

- **"going to"** is used for pre-determined prediction about the weather:

e.g. The weather forecast says it is going to rain tomorrow.

Generally, we can use both "will" and "going to" to predict the future.

- **"going to"** is used to predict the future when we have already got some evidence that

something is certain or likely to happen. When we say "something is going to happen", we know (or think) this because of the situation now.

e.g. It's going to rain later. Look at those black clouds in the sky!
(I can see the clouds building up now, it is sure to happen)

- **"will"** tends to be used when this evidence is not present, or at least is not as concrete.

e.g. I think it will rain later.
(It often does at this time of year)

6. Past Simple (Regular and Irregular verbs)

The MV Cannibal **sail*ed*** from Perth to Hong Kong last year.
We **stay*ed*** in port for several days.

To report a past event we use the past simple. The past simple often ends in **–ed**.

He **work*ed*** at Piraeus port from 1990 to 1995.
Yesterday it **rain*ed*** all morning. It **stop*ped*** in the evening.
I call my girlfriend on the phone every day. Last night I **call*ed*** her at midnight.

These verbs are *regular* verbs:
work – worked, rain – rained, stop – stopped, call – called

Spelling:

- **like** + **d** = **liked** [if the verb ends in –e, add –d]
- **stop** + **p** + **ed** = **stopped** [if the verb ends with a consonant + vowel + consonant, double the last consonant and add –ed]
- **carry** + **ed** = **carried** [if the verb ends with a consonant + y, change the –y to -i and add –ed]

Use

With the Simple Past we describe an action that occurred and was completed in the past (for instance, a year / a month / a week ago, yesterday, last month / week, in 2003, etc.).

Pronunciation

There are three ways to pronounce the final –ed of regular verbs in the simple past tense. This pronunciation is determined by the final sound of the verb in the infinitive. It is pronounced:

/id/	**/t/**	**/d/**
when the verb ends in a sound /t/ or /d/:	when the verb ends in an unvoiced consonant sound such as /k/, /s/, /ts/, /f/, /p/:	when the verb ends in any other sound (voiced consonants like /b/, /g/, /v/, /m/, /n/, /r/ and vowel sounds)
examples: want – wanted decide – decided	*examples:* like – liked wash – washed miss – missed laugh – laughed watch – watched stop – stopped	*examples:* grab – grabbed hug – hugged love – loved open – opened repair – repaired stay – stayed

Some verbs are irregular. The past simple does not end in –ed.

The ship **left** the port on 5 April and **was** at sea for three days.

These verbs are *irregular*: leave – left, be – was

Note: the verb "to be" has two past forms:

I / he / she / it **was**
we / you / they **were**

Here are some important irregular verbs:

begin – began	give – gave	meet – met
come – came	go – went	pay – paid
do – did	have – had	say – said
drink – drank	hear – heard	see – saw
eat – ate	leave – left	sell – sold
fall – fell	lose – lost	take – took
find – found	make – made	understand – understood
get – got		

7. Past Simple (questions and negatives)

Did you notify the authorities? What **did** they do to contain the spill?
The leak **did not** cause dangerous pollution.

We use **did** in past simple negatives and questions:

infinitive	*positive*		*negative*			*question*		
watch	I	watch**ed**	I		watch		I	watch?
clean	we	clean**ed**	we		clean		we	clean?
play	you	play**ed**	you		play		you	play?
do	they	**did**	they	**did not**	do	**did**	they	do?
go	he	**went**	he	**(didn't)**	go		he	go?
have	she	**had**	she		have		she	have?
begin	it	**began**	it		begin		it	begin?

BUT:

	I	**was**	I			I?
	he	was	he	**was not**	**Was**	he?
	she	was	she	(wasn't)		she?
be	it	was	it			it?
	we	**were**	we	**were not**	**Were**	we?
	you	were	you	(weren't)		you?
	they	were	they			they?

Note the most usual mistakes: I watched *but* I didn't watch (*not* I didn't watched)
He went *but* Did he go? (*not* Did he went?)

Yes / No questions – Wh-questions
Note the word order in questions with "did" and the position of the question word in wh-questions:

	Did	the captain	give	you the master key?
What	did	you	do	yesterday evening?
How	did	the accident	happen?	
Where	did	the messmates	go	after lunch?

Short answers
Yes, I did. [Yes, I / we / you / they / he / she / it did]
No, I didn't. [No, I / we / you / they / he / she / it didn't]

8. Present Perfect (Regular and Irregular verbs)

We **have secured** all moorings.
Have you **sounded** the tanks? Yes, we **have** just **finished** sounding the tanks.
Have you **connected** the bunker hoses?
The Master **hasn't signed** the Bunker Delivery Note (BND) yet.

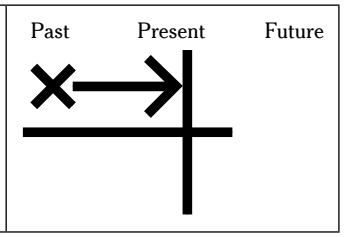
As you can see in the example sentences above, when talking about work operations, we use the Present Perfect Simple tense to

- describe ***recent*** actions
- ***check completion*** of operation procedures
- give information about activities at ***different stages*** of completion

In general, with the Present Perfect we talk about a time

from the past until now

[for instancse, ***since*** 2001 (till now), *for* 11 years (till now), ***ever*** (in your life), ***yet*** (until now), etc.]



Form of Present Perfect tense: ***have / has + past participle***

	Positive	***Negative***	***Question***
I / you / we / they	I **have** finish**ed**.	I have not finished.	Have you finished?
he / she / it	He **has** finish**ed**.	He has not finished.	Has he finished?

These verbs are **regular:** *secure – secured, sound – sounded, finish – finished, connect – connected, sign – signed*

Spelling

- ⇨ ***store + d = stored*** [if the verb ends in –e, add –d]
- ⇨ ***drop + p + ed = dropped*** [if the verb ends with a consonant + vowel + consonant, double the final consonant and add –ed]
- ⇨ ***carry + ed = carried*** [if the verb ends with a consonant + y, change the –y to -i and add –ed]

Pronunciation:
There are three ways to pronounce the final –ed of the past participle, the same as in the simple past tense. Look again at the pronunciation tables in the Past Simple section above.

Some verbs are irregular. The past participle does **not** end in **–ed**.

We **have put** the fenders in position.
Has the bunker barge **left** the vessel?
I **have sent** bunker samples for analysis.

These verbs are **irregular:** *put – put, leave – left, send – sent*
Note: the verb "to be" has the following present perfect form:

I / we / you / they **have been**
he / she / it **has been**

Look at some irregular verbs useful for describing work operations: (the simple past form is also given)

begin – began – begun	give – gave – given	lose – lost – lost
come – came – come	go – went – gone	make – made – made
do – did – done	have – had – had	say – said – said
fall – fell – fallen	hear – heard – heard	see – saw – seen
find – found – found	hold – held – held	take – took – taken
get – got – got	leave – left – left	understand – understood – understood

Here are some irregular verbs in groups.

cost – cost – cost	buy – bought – bought	spend – spent – spent
cut – cut – cut	bring – brought – brought	send – sent – sent
put – put – put	think – thought – thought	bend – bent – bent
break – broke – broken	know – knew – known	sleep – slept – slept
speak – spoke – spoken	throw – threw – thrown	sweep – swept – swept
wake – woke – woken	blow – blew – blown	keep – kept – kept

9. Talking about the future: future plans / events

Compare:

"When are you going to take the IELTS test?"	*"I am going to take the test at 1100 tomorrow."*
"Where will you be in two months?"	*"I don't know. Maybe I will be on holidays or maybe I will be at sea."*

We can use both "be going to" and "will" to discuss future events / actions;

⇨ we can use **be going to** to describe future events that we have planned or arranged.
⇨ we can use **will** to describe future events that are uncertain.

The **Simple Future** (will + infinitive) is used for *offers, predictions, threats, requests,* etc.:

- *I'll help you fill in the application.*
- *Put your hands up or I'll shoot.*
- *Tomorrow, it will be cold and rainy.*
- *Will you take the garbage out, please?*

"be going to" is used:

1. for **future plans or intentions**
   - *He is going to join the Army next month.*
2. for **predictions based on evidence**
   - *Look! That vessel is listing heavily. It is going to capsize.*

Compare:

"The ink cartridge in the printer needs refilling." *"Does it? I'll refill it later."* [on-the-spot decision]	*The ink cartridge in the printer needs refilling."* *"I know. I am going to refill it later."* [something already decided / planned]

Generally, when talking about the future, we tend to use "be going to" when we know something because of the situation now:

- *"I feel terrible. I think I'm going to be sick."*

In other situations it's safer to use "will":

- *"I think she will like the present we bought for her."*

Note: The Simple Present and the Present Continuous can also be used to talk about the future.

- *Hurry up! The movie starts in a few minutes.*
- *We're going camping this weekend.*

Form:

"will" is used before verbs in the infinitive form:

I / you / he / she / we / they	will	go ashore

Sometimes we use the short form: **I will → I'll**

- *I'll see you tomorrow*. (instead of "I will see you")

In negative sentences, **will not → won't**:

- *He won't have time to go ashore tomorrow*. (instead of "He will not have time")
- *I won't see you again for six months*!

Yes / No questions:

Will	you / he / she / they…	come home early tonight?

Wh-questions:

What	will	you / he / she / they…	buy?

"be going to" is used before verbs in the infinitive form:

I / you / he / she / we / they	am / is / are going to	go to the bank tomorrow.

Yes / No questions

Are / is / am	you / he / she / we / they / I	going to	participate in the meeting tomorrow?

Wh-questions:

When	are / is / am	you / he / she / they / I...	going to	come back?

Note: Phrases used to refer to future points in time:

e.g. *Where will you be **in two months**?*

To talk about a time in the future, we can say:

two days / weeks / months / years from now *or*

in two days / weeks / months / years / a month's time

Other future time expressions (generally used at the end of the sentence or question):

tomorrow, next week/month/year, the day after tomorrow

10. Past Continuous

Was / were + verb-ing is the **Past Continuous** tense.

I **was** paint**ing** outside the accommodation.

This tense is used to talk about an activity that was in progress at a specific time in the past. The emphasis is on the duration of the activity in the past.

What were you doing between 14:00 and 16:00 yesterday? I was sleeping.

I / he / she / it	was	painting
You / we / they	were	
Question form: Were	you	sleeping?
Negative form: I	wasn't	sleeping.

What was he doing when the collision happened?

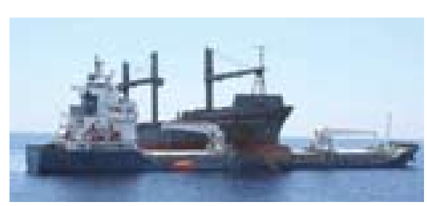
He **was** talk**ing** on the VHF, when it happen**ed**.

The **Past Continuous** tense is often used with the **Simple Past** in one sentence to show that one action was in progress when another action occurred and interrupted it. Notice how one action is already in progress when the other action happens:

PAST **He was talking on the VHF,** **NOW**

_ — _ — ✕ _ _ _ _ _ _ _ _ _ ➔

when the collision happened.



So, we use the Past Continuous tense:

- to describe repeated or continuous actions in the past.
- to describe ongoing activities in the past which were interrupted by another event.

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The following dictionaries were used for Glossary definitions:

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- Oxford Advanced Learners Dictionary, www.oxfordadnacedlearnersdictionary.com

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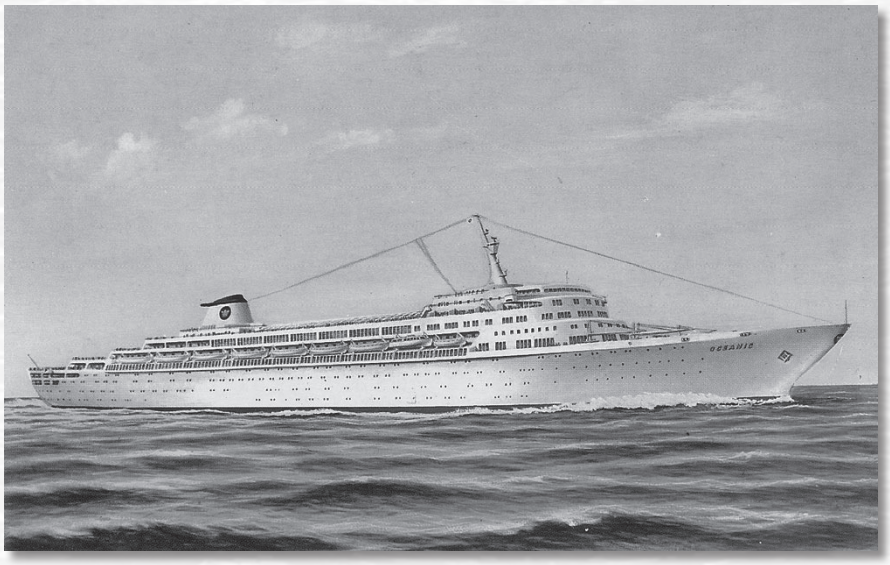

Το κρουαζιερόπλοιο «Oceanic» της Home Lines Inc.
ναυπηγημένο το 1965.

Κωδικός βιβλίου: 24-0595
ISBN (SET) 978-960-337-122-9
ISBN 978-960-337-121-2

ΙΤΥΕ "ΔΙΟΦΑΝΤΟΣ"
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