FUNCTION 2 – CARGO HANDLING & STOWAGE

COMPETENCY - MONITOR THE LOADING, STOWAGE, SECURING AND UNLOADING CARGOES AND THEIR CARE DURING THE VOYAGE

SECTION 1

The effect of cargo, including heavy lifts on the seaworthiness and stability of the ship.

Draught, Trim and Stability

1. Define the following:
   a. Deadweight;
   b. Displacement;
   c. Center of Flotation
   d. Center of Gravity
   e. Fresh Water Allowance
   f. Buoyancy
   g. Gravity
   h. Hell
   i. Trim
   j. Draught

2. What is the meaning of the follow acronym in Stability and Trim?
   a. GM
   b. LCF
   c. KN
   d. LCF
   e. FWA
   f. KB

3. Draw a ship’s load line indicating marks for various seasonal zones, areas and periods;

4. Describe the following:
   a. a deadweight scale table (include a sample table);
   b. Hydrostatic Table (include a sample table);
c. Trimming Table (include a sample table)

5. Describe the step by step procedure of the following:
   a. How calculate the amount the draught the in seawater, given the present draught and density of dock eater;
   b. How to use the deadweight scale table to determine the approximate weight of cargo loaded or discharge;
   c. How to use the Hydrostatic date table to determine the position of center of flotation, MCT and TPC for a given draught;
   d. How to calculate the new draught after loading or discharging a given quantity of cargo, given the initial draughts, forward and aft;
   e. How to use the trimming table or curves to determine changes in draught resulting from loading, discharging or moving objects;
   f. How to calculating the final draughts and trim for a planned loading by considering changes to a similar previous loading;
   g. How to determine KM and then the GM
   h. How to use KN curves to construct a curve of Statical stability;
   i. How to calculate the loss of GM resulting from absorption of water by deck cargo

6. What is the recommended initial GM for cargo ship?

SECTION 2

SECUING CARGO

1. Explain the need for a solid stow and securing of all cargoes.
2. How will you stow cargoes liable to slide during rolling, such steel rails?
3. In securing cargoes. Describe what is...
   a. Blocking;
   b. Lashing;
   c. Chocking;
   d. Tombing.
4. Describe the step by step procedure “HOW TO”...
   a. Secure cargo faces resulting from part discharge before making passage;
   b. Secure heavy loads and heavy lifts;
   c. Stow and secure vehicles and trailers
5. What is the name of the manual that will be referred to when securing unitized, container, trailer, portable tanks and other cargo units?
Securing Deck Cargoes

1. Enumerate the cargoes that can be carried on deck other than container.
2. Explain why efficient securing of deck cargo is essential for the safety of the ship as well as the cargo.
3. In stowing cargoes: Enumerate the equipment that should be leave safe access and space needed to navigate and operate the ship.
4. Describe in outline the recommendations on the stowage and lashing of time cargoes as set out in the IMO Code of Safe Practice for Ship Carrying Timber Deck Cargoes.
5. What is the purpose of “Guard Lines or Rails”
6. Describe the method of safe stowage and securing of containers on deck on vessels not specially designed for the carriage of containers.

Securing Container Cargo

1. Describe the arrangement of a container ship and explains how the position of a particular container is designated;
2. Explain briefly the sequence of operations during discharging and loading at a terminal;
3. Describe methods of securing containers on deck;
4. Describe the types and sizes of container.

Securing Bulk Cargo

1. Describe in outline the contents of the IMO, International Maritime Solid Bulk Cargo (IMBSC);
2. Define the following:
   a. angle of repose
   b. cargoes which may liquefy - flow moisture point
   c. flow state
   d. transportable moisture limit
3. Describe in detail the preparation of cargo holds prior to loading bulk cargoes;
4. What is the hazard associated with coal cargo?
5. Describe the importance of monitoring the temperature of the holds associated with carriage of coal cargoes;
6. Describe the precautions to take during loading and discharging coal;
7. Explain how coal should be ventilated;

Securing Bulk Grain Cargo

1. Define the following terms as used in the International Grain Code:
   a. Grain
   b. Filled compartment
   c. Partly filled compartment
2. What are the dangers associated with using insecticide in cargo hold;
3. Explain the importance of trimming and states how it should be made;
4. Differentiate between trimming of filled and partly filled compartments;
5. What is the use of “Fitting of Shifting Boards”
6. Describe the following:
   a. how saucers or bundles of bulk grain are arranged in the square of a hatch to reduce heeling moments resulting from a shift of grain;
   b. how the surface of a partly filled compartment is secured against movement;
   c. how to separate two different bulk grain cargoes loaded into the same compartment;

SECTION 3

CARGO CARE - INSPECTION AND PREPARATION OF HOLDS

1. Outline the reasons for a general inspection of holds;
2. Explains the importance of cleaning holds before loading;
3. Describe how to clean holds after discharge of a general cargo;
4. Describe...
   a. the reasons for using dunnage;
   b. the types and sizes of material used for dunnage;
   c. the methods of dunnaging a hold for various cargoes and how to dispose of old dunnage;
   d. that dirty dunnage may taint or contaminate the next cargo;
   e. the fitting or spar ceiling and explains its purpose;
   f. the fitting or spar ceiling and explains its purpose
   g. how limbers and drain well covers should be treated to prevent suctions being blocked by small debris, but ensuring free drainage to the suctions;

Segregation and Separation of Cargoes

1. Describe...
   a. how the following cargoes can be segregate:
      i. dangerous goods
      ii. dry cargo
      iii. wet cargo
      iv. dirty cargo
      v. delicate cargo
      vi. valuable cargo, e.g. bank notes, personal effects
   b. methods of separating adjacent parcels of cargo
   c. the use of port marking to separate parcels for discharge at different ports
Ventilation and Control

1. lists the factors involved in the control of sweat by ventilation;
2. differentiate between ship's sweat and cargo sweat and explains the conditions in which each is experienced;
3. describe the system of natural ventilation and how it should be controlled to minimise the formation of sweat;
4. describe forced ventilation and humidity control for cargo holds and states the properties measured and recorded at the control panel;
5. List cargoes requiring special ventilation

Refrigerated Cargo

1. Describe....
   a. how holds and lockers are prepared for loading;
   b. the dunnaging requirements for refrigerated cargo;
2. Explain why spaces and dunnage to be used needs pre-cooling;
3. List a sample of commodities carried chilled;
4. List a sample of frozen cargoes;
5. Enumerate the needed cargo inspection before and during loading;
6. Explain the purpose of compartment temperature recordings.

Dangerous, Hazardous and Harmful Cargoes

1. Explain...
   a. the different types of containment covered by the term "packaged form"
   b. The properties, characteristics and physical state of the different substances, materials and articles covered by the 9 classes of the IMDG Code.
   c. where to look for damage and defects most commonly encountered due to:
      i. loading and unloading operation;
      ii. corrosion;
      iii. severe weather conditions;
   d. with the aid of diagrams, the meaning of the following stowage and segregation requirements for the different types of ships:
      i. on deck only
      ii. on deck under deck
      iii. away from
      iv. separated from
      v. separated by complete compartment or hold from
      vi. separated longitudinally by an intervening complete compartment or hold
   vii.

2. Describe...
   a. the classification of dangerous goods in the International Maritime Dangerous Goods (IMDG) Code;
   b. the precautions which should be taken while loading or discharging explosives;
3. Identifies the marking, labelling and placarding of dangerous goods as required by the IMDG Code and DGs in limited quantities, e.g. schedule 18.

REFERENCES (Publication available at the UCMETC Library)
1. Admiralty Manual of Seamanship
2. Cargo Works (David House)
3. Shipmanship Technique
4. Ship Stability (Capt. D.R. Derrett, revise by Dr C.B. Barrass)

Online References:
1. http://thenauticalsite.com/NauticalNotes/CargoWork/MyCargoWkLesson01-DrftTrimStab.htm
4. http://www.veristar.com/bvrules/B_3_a2_1_1.htm
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