OOW Unlimited Stability and Operations Syllabus

Notes

1. The syllabus is based on the HND in Nautical Science. It covers Outcomes 3 & 4 of Unit 7 (Cargo Work), All Outcomes of Unit 8 (Ship Stability 1) and part of Outcomes 2 of Unit 10 (Marine Law and Management)
2. Formula sheets will be provided to candidates for the examination

1. Hydrostatics

a) Defines mass, volume, density, relative density, Archimedes principle, FWA, DWA, TPC

b) Determines TPC and displacement at varying draughts using hydrostatic tables

c) Calculates small and large changes in displacement making appropriate use of either TPC or displacement tables

d) Defines Waterline length, LBP, Freeboard, Waterplane Area, C_W, and C_B

e) Calculates the weight to load or discharge to obtain given small changes in draught or freeboard

f) Explains the reasons for loadlines and loadline zones

g) Calculates weight to load or discharge in relation to loadline dimensions, appropriate marks, TPC, FWA and DWA

2. Statical Stability at small angles

a) Defines centre of gravity, centre of buoyancy, initial transverse metacentre and initial metacentric height (GM)

b) Calculates righting moments given GM and displacement

c) Explains stable, neutral and unstable equilibrium

d) Explains the relationship between equilibrium and the angle of loll

e) Identifies from a given GZ curve; range of stability, initial GM, max GZ, angle of vanishing stability, angle of deck edge immersion, angle of loll and angle of list

f) Explains the difference between typical GZ curves for stiff and tender vessels

g) Sketches typical GZ curves for vessels at an angle of list or loll

3. Transverse Stability

a) Calculates shift of G, vertically and horizontally after loading/discharging/shifting a weight

b) Calculates final KG or GM by moments about the keel after loading/discharging/shifting weights including appropriate Free Surface Correction

c) Calculates distance of G horizontally from the centreline by moments about the centreline after loading/discharging/shifting weights

d) Calculates the effect on stability of loading or discharging a weight using ships' gear

e) Calculates the angle of list resulting from 3 a), 3b), 3c) and 3d)

f) Explains the difference between list and loll and methods of correction

g) Explains the consequences and dangers of a free surface

h) Explains that the free surface effect can be expressed as virtual rise of G or as a free surface moment

i) Describes the effects on free surface of longitudinal subdivision of a tank

4. Longitudinal Stability

a) Defines LCF, LCG, LCB, AP, Trim, Trimming Moment and MCTC

b) Calculates the effect on draughts of loading, discharging and shifting weights longitudinally by taking moments about the AP

5. Maintaining a Deck Watch (alongside or at anchor).

a) Explains the duties of the deck watch with respect to security, safety, moorings and cargo operations

b) Explains the procedures for entry to enclosed spaces and permit to work systems

c) Explains the emergency procedures in the event of fire or accident

d) Describes the preparation of the vessel for sea and adverse weather with respect to watertight integrity and security of cargo

e) Describes how safe means of access to a vessel is achieved

f) Describes the methods available to ensure safe movement onboard ship

6. Pollution prevention

a) Describes the precautions and procedures required to ensure vessel operations, including bunkering and garbage disposal, do not pollute the environment

b) Explains the procedures for handling hazardous substances onboard

7. Legislation

a) Outlines the operational requirements of the annexes to MARPOL and liability for non-conformance

b) Outlines the principles and purpose of the ISM Code

c) Describes the legal status and purpose of COSWP, MGNs, MINs, MSNs