

U.S.C.G. Merchant Marine Exam

Master Less than 500-1600 Gross Registered Tons

Q122 Deck Safety – Stability Problems

(Sample Examination)

Choose the best answer to the following Multiple-Choice Questions.

1. You have 640 tons of below deck tonnage. There is no liquid mud aboard. If you have 160 tons of cargo above deck with a VCG above the deck of 3.4 feet, what is the maximum allowed VCG of the remainder of the deck cargo that is permitted? See illustration D036DG below.
 - A. 1.24 feet
 - B. 1.65 feet
 - C. 1.98 feet
 - D. 2.46 feet

Correct answer: D

2. The SS AMERICAN MARINER is ready to bunker with drafts of FWD 14'-04", AFT 17'-06". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0180 below. Use the white pages of The Stability Data Reference Book to determine the free surface correction.

ST-0180

DB 1 CL	48.2	DB 6 CL	212.0
DB 1A CL	81.9	DB 7 P	44.6
DB 2 P	71.2	DB 7 S	94.6
DB 2 S	71.2	DT 1 CL	125.3
DB 3 CL	140.6	DT 1A CL	235.6
DB 3 P	55.6	DT 3 P	86.1
DB 3 S	55.6	DT 3 S	86.1
DB 4 CL	224.1	DT 6 P	201.2
DB 4 P	87.0	DT 6 S	201.2
DB 4 S	87.0	DT 7 P	128.8
DB 5 CL	170.4	DT 7 S	128.8

- A. 1.15 feet
- B. 1.25 feet
- C. 1.31 feet
- D. 1.48 feet

Correct answer: D

3. Your vessel's drafts are: FWD 23'-01", AFT 24'-05"; and the KG is 22.8 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the remaining righting arm at 30° inclination if the center of gravity is 1.9 feet off the centerline.
 - A. 2.3 feet
 - B. 3.7 feet
 - C. 1.4 feet
 - D. 0.7 foot

Correct answer: D

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4. Your vessel has a displacement of 24,500 tons. It is 529 feet long and has a beam of 71 feet. You have timed your vessel's rolling period to be 25.0 seconds. What is your vessel's approximate GM?
- A. 1.25 feet
 - B. 1.56 feet
 - C. 1.98 feet
 - D. 2.43 feet

Correct answer: B

5. Your sailing drafts are: FWD 22'-04", AFT 23'-06" and the GM is 3.2 feet. What will be the angle of list if #3 starboard double bottom (capacity 97 tons, VCG 2.5 feet and 23 feet off the centerline) is filled with saltwater? (Use the data in Section 1, the blue pages, of the Stability Data Reference Book)
- A. Less than 1°
 - B. 3°
 - C. 7°
 - D. 11°

Correct answer: B

6. Your drafts are: FWD 24'-09", AFT 27'-02". Use the blue pages of the Stability Data Reference Book to determine the vessels displacement if you are in salt water.
- A. 13,175 tons
 - B. 13,350 tons
 - C. 13,490 tons
 - D. 13,620 tons

Correct answer: D

7. The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0066 below. Use the white pages of The Stability Data Reference Book to determine the amount of liquid loading required in the double bottom tanks to meet a one compartment standard.

ST-0066

Deck cargo	280 Tons
Upper tween deck layer	1320 Tons
Lower tween deck layer	1260 Tons
Hold layer	1420 Tons

- A. 1171.5 tons
- B. 1311.0 tons
- C. 1503.0 tons
- D. 1710.5 tons

Correct answer: B

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8. Which term indicates the rise in height of the bottom plating from the plane of the base line?
- A. Camber
 - B. Sheer
 - C. Deadrise
 - D. Molded height

Correct answer: C

9. Use the material in Section 1, the blue pages, of the Stability Data Reference Book. If the KG is 25.2 feet, and the drafts are: FWD 27'-11", AFT 28'-09"; at what angle will the vessel lose positive stability?
- A. 54°
 - B. 59°
 - C. 65°
 - D. 71°

Correct answer: A

10. Using the information in Section 1, the blue pages, of the Stability Data Reference Book, determine the danger angle for permanent list if the KG is 21.8 feet and the drafts are: FWD 23'-05", AFT 24'-04".
- A. 26°
 - B. 21°
 - C. 37°
 - D. 31°

Correct answer: A

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U.S. Department
of Transportation
**United States
Coast Guard**



Commandant
United States Coast Guard

Washington, D.C. 20593-0001
Staff Symbol:
Phone:

16710
8 Apr 87

Master, M/V HUDSON, O.N. 666666

Subj: M/V HUDSON
Stability

Dear Sir:

A stability test, supervised by the U.S. Coast Guard, was conducted on the M/V HUDSON at San Diego, California on 08 April 1987. On the basis of this test, stability calculations have been performed. Results indicate that the stability of the M/V HUDSON, as presently outfitted and equipped, is satisfactory for operation in Ocean Service as indicated on the Certificate of Inspection, provided the following restrictions are strictly observed:

1. a. The vessel shall only be loaded according to the instructions on the attached LOADING DIAGRAM bearing U.S. Coast Guard approval stamp dated 8 April 1986.

b. Drilling fluids may be carried. The maximum specific gravity of the fluids shall not exceed 2.60.

c. The vessel may engage in towing operations when loaded in accordance with the attached LOADING DIAGRAM.

2. The height above the main deck of the center of gravity of the deck cargo shall not exceed the value shown on the LOADING DIAGRAM (3.0 feet). Such cargo must be positively secured against shifting prior to leaving protected waters.

3. Permanent ballast, in the form of 64.4 long tons of high density fluids (sg. = 2.87), is to be maintained in the after peak tank. No permanent ballast shall be added, removed, altered and/or relocated without the authorization and supervision of the cognizant Officer in Charge, Marine Inspection.

4. The maximum summer load line draft is 13 feet 8 3/8 inches. Trim shall be minimized and shall always result in a freeboard of at least 22 inches at the stern.

5. No more than one centerline or P/S pair of the following tanks may be partially filled at any one time: fuel oil, lube oil, potable water, ballast/cargo water, fuel oil day tanks, drilling fluid. Cross-connections between all port and starboard tank pairs shall be kept closed at all times when underway.

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6. Main deck hatches and weather doors to the forecastle and machinery spaces shall be kept closed and fully secured at all times when underway, except when actually used for transit under safe conditions.

7. Main deck freeing ports shall be maintained operable and completely unobstructed at all times.

8. Bilges shall be kept pumped to minimum content at all times.

9. Suitable tables or curves for determining the capacities of full or partially full tanks shall be maintained aboard the vessel.

10. The Master should make every effort to determine the cause of any list of the vessel before taking corrective action.

It shall be the Master's responsibility to maintain the vessel in a satisfactory stability condition at all times.

This stability letter shall be posted under suitable transparent material in the pilothouse of the vessel so that all pages and the diagram are visible. It supersedes any stability information previously furnished the vessel.

Sincerely,



A. B. SEA
Lieutenant Commander
U.S. Coast Guard

Attachment: LOADING DIAGRAM for the subject vessel bearing U.S. Coast Guard approval stamp dated 8 April 1987

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