

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. Your vessel's drafts are: FWD 27'-06", AFT 28'-02"; and the KG is 23.1 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the remaining righting arm at 60° inclination if the center of gravity is 2.4 feet off the centerline.
- (A) 1.8 feet
 - (B) 0.2 foot
 - (C) 0.5 foot
 - (D) 2.4 feet

If choice C is selected set score to 1.

2. Your vessel measures 122 feet long by 18 feet in beam. If the natural rolling period at a draft of 6'-09" is 5 seconds, what is the GM?
- (A) 2.5 feet
 - (B) 1.4 feet
 - (C) 2.9 feet
 - (D) 2.1 feet

If choice A is selected set score to 1.

3. The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0011 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-0011

Deck cargo	170 Tons
Upper tween deck layer	2800 Tons
Lower tween deck layer	2000 Tons
Hold layer	3200 Tons

- (A) 473 tons
- (B) 520 tons
- (C) 696 tons
- (D) 444 tons

If choice C is selected set score to 1.

4. The SS AMERICAN MARINER is ready to bunker with drafts of FWD 11'-01", AFT 15'-01". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0091 below. Use the white pages of The Stability Data Reference Book to determine the free surface correction.

ST-0085

DB 1 CL	48.2	DB 7 P	94.6
DB 1A CL	81.9	DB 7 S	94.6
DB 2 P	71.2	DT 1 CL	125.3
DB 2 S	71.2	DT 1A CL	257.6
DB 3 CL	227.6	DT 2 P	78.5
DB 3 P	55.6	DT 2 S	78.5
DB 3 S	55.6	DT 6 P	201.2
DB 4 CL	224.1	DT 6 S	201.2
DB 4 P	128.1	DT 7 P	128.8
DB 4 S	128.1	DT 7 S	128.8
DB 6 CL	242.3	DT 8 P	50.5
		DT 8 S	50.5

- (A) 0.73 foot
- (B) 0.61 foot
- (C) 1.20 feet
- (D) 0.92 foot

If choice A is selected set score to 1.

5. Your drafts are: FWD 23'-03", AFT 27'-01". Use the blue pages of the Stability Data Reference Book to determine the vessels displacement if you are in fresh water.
- (A) 12,550 tons
 - (B) 12,900 tons
 - (C) 13,200 tons
 - (D) 13,350 tons

If choice B is selected set score to 1.

6. 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°

If choice A is selected set score to 1.

7. Aboard a vessel, dividing the sum of the transverse moments by the total weight yields the vessel's _____.

- (A) transverse position of the center of gravity
- (B) righting moments
- (C) inclining moments
- (D) vertical moments

If choice A is selected set score to 1.

8. You have 360 tons of below deck tonnage and 145 tons of above deck cargo on board. You must load 220 tons of liquid mud below deck. How much more deck cargo can you load? See illustration D036DG below.

- (A) 22 tons
- (B) 48 tons
- (C) 94 tons
- (D) 239 tons

If choice C is selected set score to 1.

9. 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 22.2 feet and the drafts are: FWD 23'-06", AFT 24'-03".

- (A) 26°
- (B) 30°
- (C) 34°
- (D) 53°

If choice A is selected set score to 1.

10. 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°

If choice B is selected set score to 1.

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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.

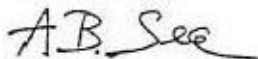
9. Suitable tables or curves for determining the capacities of full or partially full tanks shall be maintained aboard the vessel.

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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