

## U.S.C.G. Merchant Marine Exam

Master TV to Master Less than 500 Gross Registered Tons  
Oceans or Near Coastal

Q133 Deck Safety - Stability Problems

(Sample Examination)

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

1. 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 25.0 feet and the drafts are: FWD 15'-04", AFT 15'-08".
- (A) 12°
  - (B) 17°
  - (C) 20°
  - (D) 23°

*If choice D is selected set score to 1.*

2. 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

*If choice D is selected set score to 1.*

3. Your vessel's drafts are: FWD 22'-03", AFT 22'-09"; and the KG is 24.4 feet. What is the righting moment when the vessel is inclined to 15°? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)
- (A) 4,176 foot-tons
  - (B) 5,916 foot-tons
  - (C) 7,076 foot-tons
  - (D) 9,003 foot-tons

*If choice B is selected set score to 1.*

4. The SS AMERICAN MARINER is ready to bunker with drafts of FWD 12'-07", AFT 16'-01". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0167 below. Use the white pages of The Stability Data Reference Book to determine the free surface correction.

DB 1 CL	48.2	DT 6 P	201.2
DB 2 P	65.0	DT 6 S	201.2
DB 2 S	65.0		
DB 3 CL	227.6		
DB 4 CL	224.1		
DB 5 CL	196.2		
DB 5 P	178.0		
DB 5 S	180.0		
DB 6 CL	220.0		
DB 7 P	90.0		
DB 7 S	90.0		

- (A) 1.07 foot
- (B) 0.82 foot
- (C) 0.96 foot
- (D) 1.30 feet

*If choice A is selected set score to 1.*

5. Your drafts are: FWD 23'-03", AFT 24'-01". Use the blue pages of the Stability Data Reference Book to determine the vessels displacement if you are in fresh water.

- (A) 11,650 tons
- (B) 11,800 tons
- (C) 12,000 tons
- (D) 12,250 tons

*If choice C is selected set score to 1.*

6. Your vessel measures 119 feet long by 17 feet in beam. If the natural rolling period at a draft of 5'-05" is 6 seconds, what is the GM?

- (A) 1.14 feet
- (B) 1.36 feet
- (C) 1.55 feet
- (D) 1.96 feet

*If choice C is selected set score to 1.*

7. 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.

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

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

*If choice B is selected set score to 1.*

8. Your sailing drafts are: FWD 17'-07", AFT 18'-03" and the GM is 2.8 feet. What will be the angle of list if the #4 starboard double bottom (capacity 141 tons, VCG 2.6 feet, and 23.8 feet off the centerline) is filled with saltwater? (Use the data in Section 1, the blue pages, of the Stability Data Reference Book)

- (A) 6°
- (B) 8°
- (C) 10°
- (D) 12°

*If choice B is selected set score to 1.*

9. The deck beam brackets of a transversely framed vessel resist \_\_\_\_\_.

- (A) sagging stresses
- (B) racking stresses
- (C) shearing stresses
- (D) hogging stresses

*If choice B is selected set score to 1.*

10. You are loading in a port subject to the winter load line mark and bound for a port subject to the summer load line mark. You will enter the summer zone after steaming six days. You will consume 32 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.005, and the average TPI is 65. What is the minimum freeboard required at the start of the voyage?  
Reference Table BL-0020 below.

FREEBOARD FROM DECK LINE	LOAD LINE
Tropical	72 inches (T) 7 inches above (S)
Summer	79 inches (S) *
Winter	86 inches (W) 7 inches below (S)
Fresh water allowance	6 inches

- (A) 90 inches
- (B) 93 inches
- (C) 70 inches
- (D) 81 inches

*If choice D is selected set score to 1.*

## D036DG

US 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.

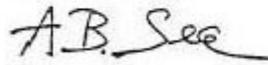
9. Suitable tables or curves for determining the capacities of full or partially full tanks shall be maintained aboard the vessel.

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

## D036DG

