

## 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. What is the displacement of a barge which measures 85' x 46' x 13' and is floating in salt water with a draft of ten feet?
- A. 17.5 tons
  - B. 1452 tons
  - C. 500 tons
  - D. 1117 tons

Correct answer: D

2. 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°

Correct answer: A

3. Your vessel's drafts are: FWD 19'-09", AFT 20'-09"; and the KG is 24.6 feet. Use the selected stability curves in the blue pages of the Stability Data Reference Book to determine the remaining righting arm at 15° inclination if the center of gravity is 0.5 foot off the centerline.
- A. 0.0 feet
  - B. 0.5 foot
  - C. 1.2 feet
  - D. 1.7 feet

Correct answer: A

4. 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

Correct answer: C

5. Bilge keels are more effective at dampening rolls under which condition?
- A. Pitching increases
  - B. List increases
  - C. Draft decreases
  - D. Rolling increases

Correct answer: D

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Illustrations: 1

6. You have 6 containers of rig supplies each measuring 8'L by 4'B by 3'H and weighing 1.6 tons each. Each container is stowed on deck. What is the maximum VCG permitted of the remaining cargo if you are carrying rig water and load to maximum capacity? See illustration D037DG below.
- A. 0.4 foot
  - B. 0.9 foot
  - C. 1.75 feet
  - D. 2.18 feet

Correct answer: D

7. The SS AMERICAN MARINER is ready to bunker with drafts of FWD 13'-10", AFT 16'-04". After all bunkers are on board, soundings indicate the tonnages shown in table ST-0187 below. Use the white pages of The Stability Data Reference Book to determine the free surface correction.

**ST-0187**

DB 1 CL	40.0	DB 5 P	178.0
DB 2 P	65.0	DB 5 S	180.0
DB 2 S	65.0	DB 6 CL	242.3
DB 3 CL	227.6	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 5 CL	196.2		

- A. 0.96 foot
- B. 0.73 foot
- C. 1.07 foot
- D. 1.30 feet

Correct answer: B

8. 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

9. The SS AMERICAN MARINER is loaded with the cargo shown in table ST-0143 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-0143**

Deck cargo	180 Tons
Upper tween deck layer	3000 Tons
Lower tween deck layer	3500 Tons
Hold layer	2500 Tons

- A. 451 tons
- B. 1126 tons
- C. 1451 tons
- D. 1726 tons

Correct answer: B

10. You are loading in a port subject to the summer load line mark and bound for a port subject to the tropical load line mark. You will enter the tropical zone after steaming four days. You will consume 33 tons of fuel, water, and stores per day. The hydrometer reading at the loading pier is 1.006, and the average TPI is 66. What is the minimum freeboard required at the start of the voyage? Reference Table BL-0022 below.

**BL-0022**

FREEBOARD FROM DECK LINE		LOAD LINE	
Tropical	77 inches	(T)	7 inches above (S)
Summer	84 inches	(S)	*
Winter	91 inches	(W)	7 inches below (S)
Fresh water allowance	8 inches		

- A. 78 inches
- B. 82 inches
- C. 86 inches
- D. 88 inches

Correct answer: A

## D037DG Part 1 of 2

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



Commandant  
United States Coast Guard

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

16710  
13 May 87

Master, M/V SURVEYOR, O.N. 678678

Subj: M/V SURVEYOR  
Stability

Dear Sir:

A stability test, supervised by the U.S. Coast Guard, was conducted on the M/V SURVEYOR at New Orleans, Louisiana, on 7 May 1987. On the basis of this test, stability calculations have been performed. Results indicate that the stability of the M/V SURVEYOR, 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 maximum of 78 persons may be carried. In no case shall the number of persons exceed that allowed on the Certificate of Inspection.
2. The drafts as read on the draft marks shall not exceed 6 feet 3 inches forward or 7 feet 1 inch aft. Trim should be minimized. A loadline is not authorized.
3. The height above the main deck of the center of gravity of deck cargo shall not exceed 2.0 feet. Such cargo must be positively secured before leaving protected waters.
4. A maximum of 50 long tons of deck cargo may be carried when no other below deck ballast or cargo is carried. When rig water is carried, a maximum of 35 long tons of deck cargo may be carried, and no other below deck cargo or ballast is permitted.
5. No permanent ballast or other such weights shall be added, removed, altered, and/or relocated without the authorization and supervision of the cognizant Officer in Charge, Marine Inspection.
6. No watertight bulkheads shall be removed or altered without the authorization and supervision of the cognizant Officer in Charge, Marine Inspection.
7. The watertight door in the bulkhead at frame 18 shall be closed and properly dogged at all times when underway except when actually used for transit under safe conditions.

## D037DG Part 2 of 2

8. Cross-connections between all tank sets shall be kept closed at all times when underway.
9. Bilges shall be kept pumped to minimum content at all times.
10. Jet fuel may be carried on deck in eight DOT tanks. The total weight of the fuel and tanks shall not exceed 23.16 long tons and the vertical center of gravity shall not exceed 3 feet 6 inches above the deck. Such tanks must be positively secured against shifting in a seaway prior to leaving protected waters. Neither passengers nor other deck cargo shall be carried when such tanks are aboard the vessel.
11. 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 temporary stability letter shall be posted under suitable transparent material in the pilothouse of the vessel so that all pages are visible. It supersedes any stability information previously furnished the vessel.

Sincerely,



W. T. DOOR  
Lieutenant Commander  
U.S. Coast Guard