U.S. Department of Homeland Security

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MEMORANDUM

From: R. A. Nash, CAPT
Marine Safety Center (MSC)

To: CG MSO Providence

Subj: GAUGING REPORTS FOR THE T/B B NO 120 OIL SPILL

Ref: (a) Independent Maritime Consulting Ltd, "Report on investigation of quantity of oil spilled from the barge B 120 at Buzzards Bay April 2003"
(b) Buzzards Bay Project National Estuary Program, "An interim analysis of the June 14, 2003 report by Independent Maritime Consulting on the volume of oil Spilled by the Bouchard Transportation Company tank barge Bouchard No. 120 in Buzzards Bay," dated February 3, 2004
(c) Independent Maritime Consulting Ltd, "B 120 oil spill, April 27, 2003 at Buzzards Bay. Response to Joe Costa's interim analysis of our original report issued June 14, 2003," dated March 18, 2003
(d) Buzzards Bay Project National Estuary Program letter dated April 16, 2004

1. As requested in your Memos dated 12 Feb and 23 Mar 2004, we have reviewed references (a) through (c). Additionally, we received and reviewed reference (d). All of these reports attempt to quantify the amount of oil spilled by the T/B B NO 120 on or about 27 Apr 2003 when it was holed while transiting Buzzards Bay.

2. We have attempted to use our engineering and naval architecture expertise to independently verify the amount of oil spilled. However, the only portions of references (a) through (d) that employ engineering fundamentals are the hydrostatic balance calculations. Even if the calculations in reference (a) are slightly inaccurate, as alleged in reference (b), a hydrostatic balance analysis predicts that, at a minimum, approximately 23,000 gallons of oil was spilled from the damaged #2 starboard cargo tank. However, as pointed out in references (a) and (b), this technique is normally only used to estimate oil outflow for a stationary vessel in calm water. Since this barge may have been transiting at nearly 10 knots in 5 foot seas, its movement through the water and the variable hydrostatic pressure caused by the sea state are not accounted for by the hydrostatic balance analysis. Accordingly, the actual amount of oil spilled was likely much greater than that estimated using this approach.

3. With the exception of the hydrostatic balance analysis discussed above, the analyses and assumptions in references (a) through (d) are not based on theoretical engineering principles normally employed by the Marine Safety Center. Instead, Independent Maritime Consulting Ltd. (IMC) has attempted to determine the oil outflow by comparing the departure ullage report from Coastal Eagle Point and the post-casualty "received/recovered oil" information from Mirant Sandwich and Caddell Shipyard. Where information is incomplete or unknown, IMC has made assumptions. Though there are no engineering principles or analyses for us to independently verify or validate, we have thoroughly reviewed all of the information and identified what we believe are the two most significant assumptions made by IMC.

a. IMC assumes the post-casualty ullages recorded by Caleb Brett on 28 April, 2003, the day immediately following the casualty, were inaccurate due to the sea state, swell size, and trim of the damaged barge. However, reference (b) indicates the sea state had declined by the time the tanks were sounded. If you have not already exhausted all means, recommend you interview the Caleb Brett employees who were on scene, analyze any available NOAA buoy data, and examine any other available information to determine if the conditions at the time of the gaugings prevented Caleb Brett from obtaining accurate ullage readings.

b. IMC assumes the oil/water interface was not fully developed when the post-casualty ullages were recorded by Caleb Brett on 28 April, 2003, the day immediately following the casualty. The report suggests the temperature of the water and the density of the oil would have prevented the interface from fully developing and questions the accuracy of the methods employed. However, reference (b) indicates the cargo was likely still at elevated temperatures and the oil/water interface was fully developed. If you have not already exhausted all means, recommend you interview the Caleb Brett employees who were on scene and examine any other available information to determine if the conditions at the time of the gaugings prevented Caleb Brett from finding the oil/water interface and obtaining accurate ullage readings.

4. If the assumptions discussed above are not valid, there seems to be no apparent reason to question the post-casualty ullages recorded by Caleb Brett on 28 April, 2003. Even if these two assumptions are found to be accurate, the water content in the oil delivered to Mirant Sandwich and recovered at Caddell Shipyard must be accurately determined. Though reference (a) assumes the oil delivered to Mirant Sandwich contained less than 1% water, we found no data to support this assumption. Given that approximately 3.5 million gallons of oil were delivered, minor differences in the water content have a tremendous impact on the oil outflow estimate.

5. In summary, without more information to support the assumptions discussed above, we do not feel it is possible to assert that the oil outflow predicted in reference (a) is any more accurate than the estimate determined using the post-casualty ullages recorded by Caleb Brett on 28 April, 2003, whose measures estimate that 98,000 gallons of oil spilled. Our review of the information provided in the above references does not find methodologies or engineering practices that are more credible than the post-casualty ullages recorded by Caleb Brett. We therefore do not dispute them.

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