

BULK CARRIER WEB FRAME DAMAGE



M/V CAPETAN LETERIS, IMO #: 8309414

February 4, 1999

At Todd Shipyard, Seattle, Washington

M/V CAPETAN LEFTERIS

- The ship's Advance Notice of Entry (ANE) ETA at Buoy "J" was 3 February 1999 at 1000 hours. The ship's ANE stated "Due to bad weather a have damage in ballast TS TK no. 3 port and in no. 4 cylinder main engine. No any pollution. No any leakage."



**Interior of #3 Port Wing Tank looking forward.
View of transverse web frame, underside of
deck plating, and deck longitudinals.**

- **A USCG COTP Transit Approval letter, dated 3 February 1999, referred to "reporting three minor cracks on the vessel's main deck plating, damaged brackets on the number three hold port hatch coaming and problems with the number 4 cylinder in your main diesel engine stemming from severe weather conditions. I understand that you have determined there is no serious affect on the integrity of the hull and seaworthiness of the vessel." It later became apparent that the Master knew of the extensive transverse web frame damage on 24 January 1999, but did not relay that information via the Safety Report to Ecology or the USCG COTP.**



Port side Hold #3 hatch side bracket.

- The Master stated that deck cracks were discovered on 24 January 1999 after experiencing heavy weather (Force 10-12). The Master stated he entered the #3 Port Ballast Wing Tank and assessed the damage. He had his crew enter #3 Port Ballast Wing Tank and welded temporary metal support brackets and turnbuckles to restrict further failure of the transverse web frames. The Master said the repairs occurred between 24-27 January 1999.



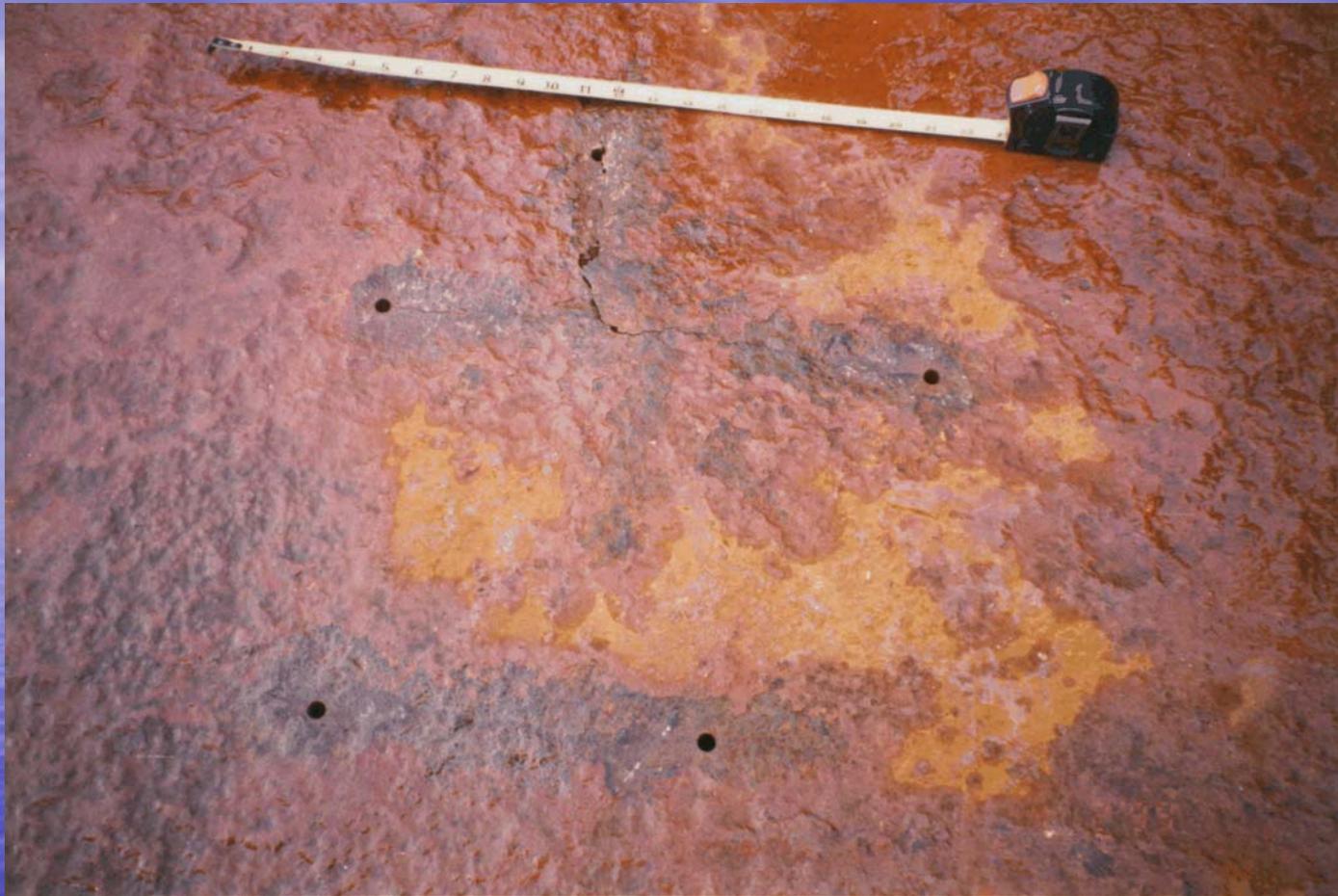
First of three port side deck plate fractures adjacent to Hold #3.

- **Upon inspection, the #3 hold hatch coaming showed significant damage. There were numerous hatch coaming brackets on the port side of #3 hold that were cracked and that had temporary repair braces welded on them. There were three distinct deck fractures of approximately twelve inches in length and 1/8 inch wide located above three transverse web frames on the main deck on the port side of #3 hold. The damaged deck area is immediately above #3 Port Ballast Wing Tank.**

#3 Hatch Port Side

Temporary
Hatch
Coaming
Bracket
Bracing





Second of three port side deck plate fractures adjacent to Hold #3.

- **The aft bulkhead for #3 Port Ballast Wing Tank is located at frame #109 and the forward bulkhead is at frame #144. There are six transverse web frames between the fore and aft bulkheads of #3 Port Ballast Wing Tank. Upon entering the #3 Port Ballast Wing Tank it was noted that all six transverse web frames were structurally damaged. Each of the six frames had three distinct areas in common where cracking and deformation had occurred. There were numerous plates welded across the fractures and breaks in order to tie them together. Padeyes connected with turnbuckles were also attached across fractures and breaks.**



**Interior of #3 Port Wing Tank looking forward.
View of transverse web frame, and deck
longitudinal.**



Interior of #3 Port Wing Tank looking forward. View of transverse web frame, underside of deck plating, deck longitudinals, and forward tank bulkhead.

- The vessel's flag was Greek. Last Port State inspection was in Kwinana, Australia on 22 December 1998 where two deficiencies were noted as follows:
 - 1) Cargo securing manual not approved by Flag State,
 - 2) Trim and Stability manual not approved by Flag State.
- The Master stated that the last drydocking was approximately two years ago.



Interior of #3 Port Wing Tank looking forward. View of transverse web frame.

- Inspection of the vessel showed that loss of seaworthiness/fitness for service resulted from substantial structural failure of the web frames in #3 Port Ballast Wing Tank, the port-side #3 hatch coaming brackets, and the main deck port-side in way of #3 hold.

Based on the information gathered, the immediate cause was as follows:

- **Structural failure** – the #3 Port Ballast Wing Tank web frames, #3 hatch coaming brackets, and main deck failed. The latter two failures likely resulted from the failure of the #3 Port Ballast Wing Tank web frames.



Interior of #3 Port Wing Tank looking forward. View of transverse web frame, underside of deck plating, and deck longitudinal.

NOTE: Light through deck crack in upper right corner.

- **Weather was alleged by the Master to have been the cause of the damage. He reported Beaufort force 10 to 12 conditions [f10=48 to 50 knots; f12=64+ knots] on 24 January 1999. Weather maps for 24 January 1999 show a “developing storm” in the western Pacific near Lat. 42N, Long. 175E. However, winds plotted from ship reports in the area show winds in the range of 15 to 35 knots. While force 10 to 12 conditions may have been encountered by the ship—perhaps during squalls or frontal passage, weather data does not indicate a prolonged period of storm or hurricane force conditions near the estimated position of the ship on 24 January 1999.**



**Interior of #3 Port Wing Tank looking forward.
View of transverse web frame, underside of
deck plating, and deck longitudinals.**

- **Inquiries were made to the ship's class society.** The class society would not speculate as to the cause of the observed damage and said it was not part of their job to determine cause of the damage, but did provide general information regarding failures of hatch coamings. The general information spoke of the damage from dynamic loads due to sloshing within holds used for ballast and the damage from improperly vented ballast holds during deballasting operations.



Interior of #3 Port Wing Tank looking aft.
View of transverse web frame.

An inquiry to the company resulted in the following information being provided:

- **It was established that prior to the incident the Master has emptied no. 3 TWT [Top Wing Tank] in order to improve strength of the vessel.**
- **In order for the Master to reach the above decision he had examined different loading conditions.**
- **Unfortunately the loading calculation, even though it examined the global stresses, did not take into account the local forces encountered. As a result stresses were produced due to the pounding of the ballast water inside cargo hold no. 3 on the sloping plate of the TST no. 3 which at this time was empty.**

Additionally the company stated:

- **The conditions caused the deck plating and web frames to crack.**
- **From these calculations it evident that when TST no. 3 is empty the global stresses are improving (from max S.F. 112% it falls to 97%). Here it must be pointed out that the subject calculation does not include the "Bulkhead Factor Correction" which will lower the results about 15% (80%).**



**Interior of #3 Port Wing Tank looking forward.
View of transverse web frame, and deck
longitudinals.**

Based on the information gathered, the underlying causes are as follows:

- **Sea State and Wind** – wind and wave provided the force, in combination with the ship's motion, to initiate sloshing in the cargo hold and the attendant damage;
- **Inattention** – the Master did not account for the localized stresses induced by emptying the #3 Port Ballast Wing Tank while the #3 cargo hold contained ballast water that was sloshing;
- **Inadequate policies/procedures** – corrective action outlined by the company indicates that there were no standing instructions in the ballast calculation file with respect to localized stresses induced by ballasting configuration.



**Interior of #3 Port Wing Tank looking forward.
View of transverse web frame, underside of
deck plating, deck longitudinals, and forward
tank bulkhead.**

The company outlined the following corrective action:

INSTRUCTION TO MASTER

- **When sailing in ballast condition, No. 3 TST to be full.**
- **Specific standing instructions in this respect to be given to the vessel and placed in the ballast calculation file.**
- **All deck officers who will be making loading calculations to be briefed on this condition prior to joining vessel.**
- **Examine similar situations with other vessels of the fleet.**



**Interior of #3 Port Wing Tank looking forward.
View of transverse web frame, and forward tank
bulkhead.**

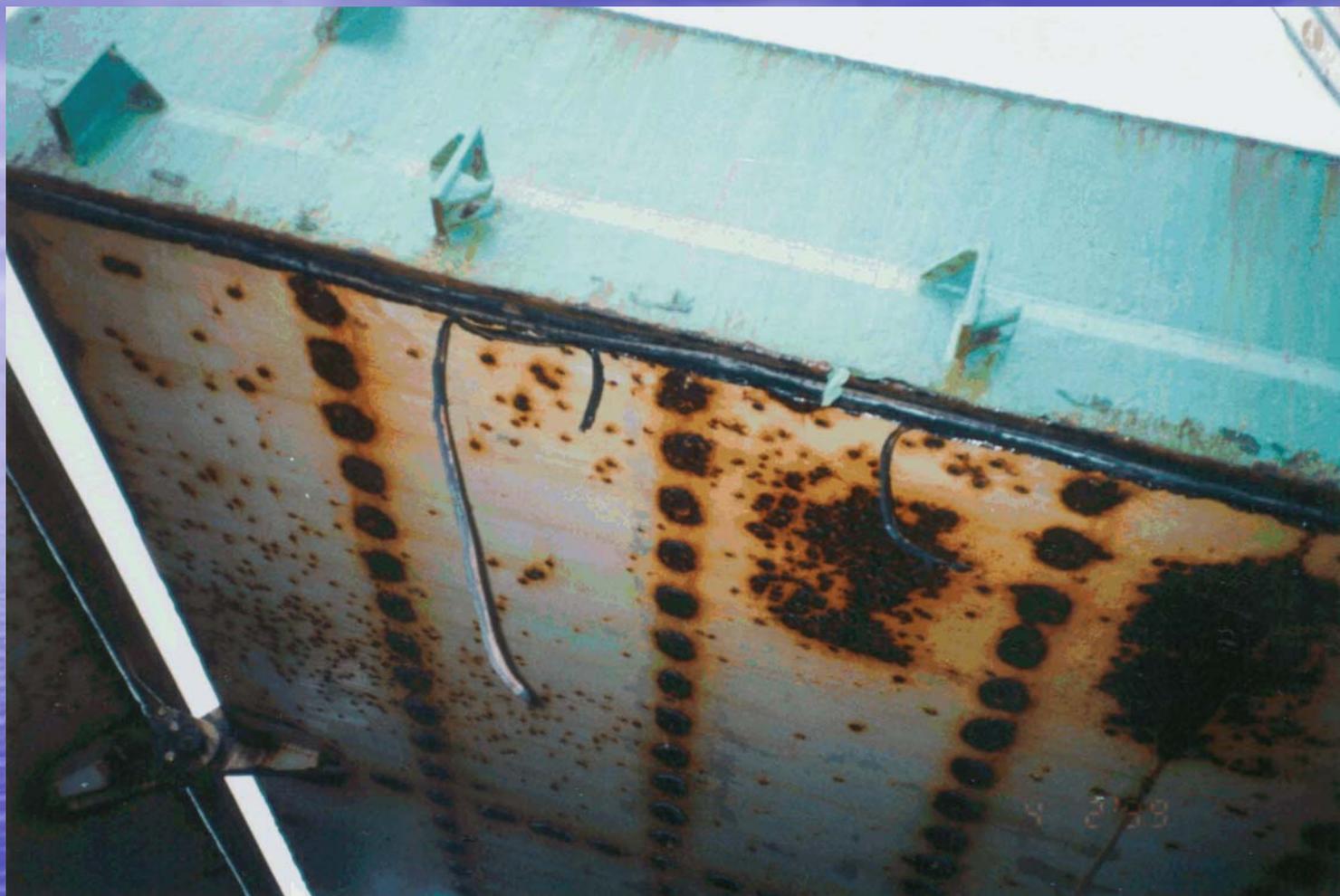
Prevention Recommendations:

- Ensure that company's has adequate policies and procedures regarding ballasting operations.
- Ensure that cargo securing manual and trim and stability manual are approved and up-to-date.



**Interior of #3 Port Wing Tank looking forward.
View of transverse web frame, and deck
longitudinals.**

NOTE: DNV class inspector.



Port side Hold #3 hatch lid. Note deteriorated cover gasket material.