Coast Guard Sector Houston-Galveston
Marine Safety Information Bulletin 14-20

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Time: 0922

Loss of Vessel Propulsion, Maneuverability and Safety Systems Due to Clogged Sea Strainers

This MSIB is issued to provide awareness for the upcoming Gulf Menhaden seasonal event. Some of the inherent risks to vessels that use sea strainers include loss or reduction in propulsion, reduced maneuverability, and loss of water pressure within the firefighting systems.

Loss or reduction in propulsion continues to occur in the Houston Ship Channel (HSC) complex. One of the causes continues to be accumulation of small fish in vessels' sea strainers. This is typically a seasonal event involving primarily Gulf Menhaden, with May-October being the highest risk (although vessels have reported encountering Menhaden in their sea strainers year round). Gulf Menhaden are found in coastal and inland tidal waters and form large surface schools, appearing in near-shore Gulf waters. Schools of fish are drawn into the vessel's sea chest clogging the sea strainers, reducing cooling and causing high water/oil temperatures. In extreme cases, these fish have choked entire coolant systems resulting in engine auto slow down or automatic shutdown. Any system that takes suction from the sea could be at risk at any given moment due to the narrow waterway and the draft of vessels creating very high density of schooling fish in the water column.

The Lone Star Harbor Safety Committee's Causality Analysis Workgroup (CAWG) developed a feedback form titled "*Vessel Questionnaire on Cooling Water Impacts by Menhaden Fish*" which deep draft vessels are again asked to complete and submit to kathleene@theagcteam.com. The data collected will assist the CAWG with its continued analysis of the patterns of the Menhaden and the development of additional best practices.

Recommended Best Practices:

1. Sea chests should not be used without filter strainers in place and should be monitored at all times in the HSC.

2. Detailed procedures for cleaning seawater strainers should be established. These procedures may include back-flushing or regular changing and cleaning duplex strainers as appropriate.

3. Prior to transit, inspect and clean the service sea chest. Ensure filters and coolers are clean prior to entry into U.S. waters. Implement a preventative system that requires frequent cleaning and swapping between sea strainers.

4. Monitor the pressure on pumps and filters. Be prepared to respond quickly when reduced performance is observed.

5. Have a contingency plan in place and ensure all engineering staff is familiar with the plan. Consider posting a double watch in the engine room while in pilotage waters. Have crew ready for cleaning of strainers during transit.

6. All tools and equipment for opening the sea chest and cleaning the strainer should be prepared and ready for usage.

7. Vessels regularly transiting the HSC may consider having spare clean filter strainers onboard, allowing quick changeovers of strainers.

8. Consider implementation of an engineering-designed approach, such as using the aft peak tank for seawater cooling purposes or internal cooling, which is commonly used for vessels which operate in extreme cold weather conditions such as the Baltic Sea and Great Lakes during the winter.

This bulletin shall remain in effect until April 1, 2021.

K. D. ODITT
Captain, United States Coast Guard
Captain of the Port

Enclosure: (1) Menhaden Identified Best Practices and Menhaden Questionnaire

Menhaden Identified Best Practices

- Prior to transit, inspect and clean the service sea chest. Ensure filters and coolers are clean prior to entry into US waters.
    - Regularly clean the sea chest, especially if vessel is expected to transit in shallow waters.

- Houston Pilots will proactively engage in discussion on this issue during Master/Pilot conference
    - Recommend additional personnel standby in engine room with essential equipment ready to clean the strainers.
    - Recommend that strainers be cleaned just prior to HSC transit.
    - Task Risk Assessments (or similar) should be carried out prior to transiting the HSC, and discuss among crew immediate actions to be taken when the strainer becomes clogged.

- The workgroup will continue to coordinate with Texas Parks and Wildlife to identify peak periods of projected activity in the HSC and the workgroup will make this data available to the vessel via the vessel agent. Workgroup will also be coordinating with Texas A&M University to identify environmental factors that are relevant to peak seasonality and locations where these concentrations maybe in the HSC.

- Be aware of the Solunar activity for your day/time of transit, since high levels of "fish activity" have correlated to clogging incidents.

- Operate on minimum cooling capacity, keep maximum buffer.

- Ensure all pressure gauges are working.

- Monitor pumps and filter differential pressures. Monitor SW pressure for signs of reduced performance. If observed, call out team for cleaning strainers.

- Continuously monitor suction and discharge pressure of main engine sea water pump in use during transit. Have low pressure alarm for sea water cooling for main engine air coolers

- No recirculation of sea water should be carried out during the transit.

- Continuously monitor and control relevant temperatures.

- Have a contingency plan in place and ensure all engine personnel are familiar with the plan.

- All engine crew to be familiar with the system and its proper procedure of change over from one sea chest to the other and the proper venting.

- Maintain good communication between bridge and Engine Control Room.

- Consider posting a double watch in the engine room while in pilotage waters. Have personnel ready for cleaning of strainers during transit.

- All tools and equipment used for opening the sea chest and cleaning the strainer should be standing by and ready for usage.
    - It is a good practice to always keep all the bolts and nuts of the sea chest filter cover well lubricated and eased up in order to avoid unnecessary delay in opening the filter. Same should be done for the coolers suction filters.
    - Have a spare LT cooler sea water inlet strainer basket to reduce the time required to get the cooling system back in use.

- Vessels regularly transiting the HSC should consider having a spare clean filter strainer standing by, allowing quick changeovers of strainers.

- Use one sea chest only and keep the other one(s) for backup/stand by. Make it a routine to check/clean sea chest and central coolers for efficient operation of the ship.

- The quantity of small fish sucked into the sea chest is dependent on the sea water cooling flow. The sea water quantity which is pumped through the sea water pumps may be reduced in order for the vacuum in the sea chest to be decreased.

- Keep fresh water generator ready for use. Fresh water evaporator must be ready but the ejector sea water pump should be at stop condition.

- Consider back-flush arrangements for filters and coolers during design or retrofit of vessel.

Vessel Questionnaire on Cooling Water Impacts by Fish

Section A - Vessel information (status prior to transit)	
1. Date:	2. Time:
3. ☐ Inbound ☐ Outbound	
4. Type of Vessel: ☐ Tanker ☐ Chemical tanker ☐ Container ☐ Dry cargo ☐ Other	
5. Summer Deadweight (in thousands of tons): ☐ 3-10k DWT ☐ 11-20k DWT ☐ 21-48k DWT ☐ 49-80k DWT ☐ >81k	
6. Vessel LOA: ☐ <61m (<200 ft.) ☐ 61m - 152m (200 ft. - 500 ft.) ☑ 153m - 244m (501 ft. - 800 ft.) ☐ >244m (>800 ft.)	
7. Vessel Breadth: ☐ <15m (<50 ft.) ☐ 15m - 32m (50 ft. - 105 ft.) ☐ 33m - 37m (106 ft. - 120 ft.) ☐ >37m (>120 ft.)	
8. Vessel Condition: ☐ Ballast ☐ Loaded	
9. Vessel Draft - Aft (if not known, then Mean Draft): _____ ☐meters ☐feet	
Section B - Engine cooling information (status prior to transit)	
10. Has your vessel cleaned the sea chest strainers prior to transiting the Houston Ship Channel? ☐ ≤12 hrs. ☐ ≤24 hrs. ☐ ≤48 hrs. ☐ ≤72 hrs. ☐ >72 hrs.	
11. What is the height above the keel of your sea suctions? _____ Port high _____ Starboard high _____ Port low _____ Starboard low ☐meters ☐feet	
12. Which sea suctions are being used for this transit? ☐ Port high ☐ Starboard high ☐ Port low ☐ Starboard low	

13. Are sea chests equipped with an operating back flush arrangement?

☐ Yes ☐ No

14. Are sea chests and coolers on a common system?

☐ Yes ☐ No

15. Do you have a contingency plan if a sea chest gets clogged or if the low sea water pressure alarm activates?

☐ Yes ☐ No

16. If yes, please briefly describe your contingency plan:

Section C - Transit information

17. During this transit did your vessel experience any of the following (check all that apply):

- ☐ Complete loss of propulsion
- ☐ A temporary and/or voluntary speed reduction to prevent any loss of maneuverability, potentially due to cooling water obstructions
- ☐ Overheating of the main engine (high temperature alarms)
- ☐ Low sea water pressure alarm activated

- If you checked any box above, please answer remaining questions #18-24.
- If you did not check any boxes, please skip to questions #23-24.

18. Date of occurrence:	19. Time of occurrence:

20. Location of occurrence:

- ☐ Houston Turning Basin
- ☐ Above Morgan's Point at: _____ (be specific, such as buoy #)
- ☐ Below Morgan's Point at: _____ (be specific, such as buoy #)
- ☐ Galveston/Texas City area: _____ (be specific)
- ☐ Bolivar Roads and/or Bolivar Roads Anchorage
- ☐ Offshore Fairway and/or offshore Anchorages
- ☐ Alongside berth _____ (berth name)

21. If you had to switch sea chests, which ones did you switch to?

- ☐ Port high ☐ Starboard high
- ☐ Port low ☐ Starboard low

22. Please briefly describe any other actions taken:

Section D - Comments

23. Any best practices to share based on your experiences?

24. Other comments and feedback you would like to provide to the workgroup?