

Incident Alert

Mooring Shackle Failure

Event Details

490171: When carrying out mooring inspections after a LPW (Long Period Wave) event two Norwegian shackles were found with severe cracking in the staple end.



Timm Boss Link 120T



Image showing the cracks at the Bow end of the shackle

Harm/damage description

There was no harm or damage caused by this event. Had the inspection regime failed, the failure may not have been identified which would have resulted in destruction of the shackle and the ship breaking loose.

Actions

Several actions have been raised to eliminate the risk of this event occurring again including the following:

- The Shackles were removed from service and a full inspection of all shackles conducted. A failed shackle was sent for metallurgy tests and the results found to be:
 - Boss Link failure has resulted from the presence of significant shrinkage cracks at the bow end which formed during solidification of the casting. Shrinkage cracking was noted to be predominantly sub-surface.
 - Exposure to cyclic stress has resulted in fatigue crack propagation from these defects, giving rise to Boss Link cracking now apparent.
 - Chemical analysis showed that the link material was not consistent with wrought alloy grade 329 stainless steel.
- Inspection schedule adjusted to ensure full visual inspection carried out after every shipping cycle
- All Shackles have been crack tested by in house engineering team and 8 cracked shackles have been removed from service (58 in use total)
- Currently researching alternatives to replace entire stock