



UNITED STATES COAST GUARD
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MARINE SAFETY ALERT

Inspections and Compliance Directorate

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HIDDEN CORROSION ON DECK FITTINGS CAN CAUSE DANGEROUS FAILURES

A recent marine casualty that resulted in a severe injury to a crewmember onboard a United States flagged cargo vessel brought to light a dangerous and potentially fatal situation involving D-ring lifting points.

While positioning a removable hatch cover on the vessel (Figures 1 and 2), three of the four D-ring securing straps failed (Figures 3 and 4), causing an uncontrolled snap-back of the lifting sling assembly that struck the crewmember in the head. The three fractured securing straps showed similar failures with a significant amount of corrosion beneath the paint and on the underside of the straps. It is likely that just one D-ring failed initially, which would have instantly doubled the load on the two adjacent corner D-rings, both of which were apparently weakened and subsequently failed.

Without proper and periodic inspection and replacement, corrosion and stress can eventually lead to deck fitting failures.

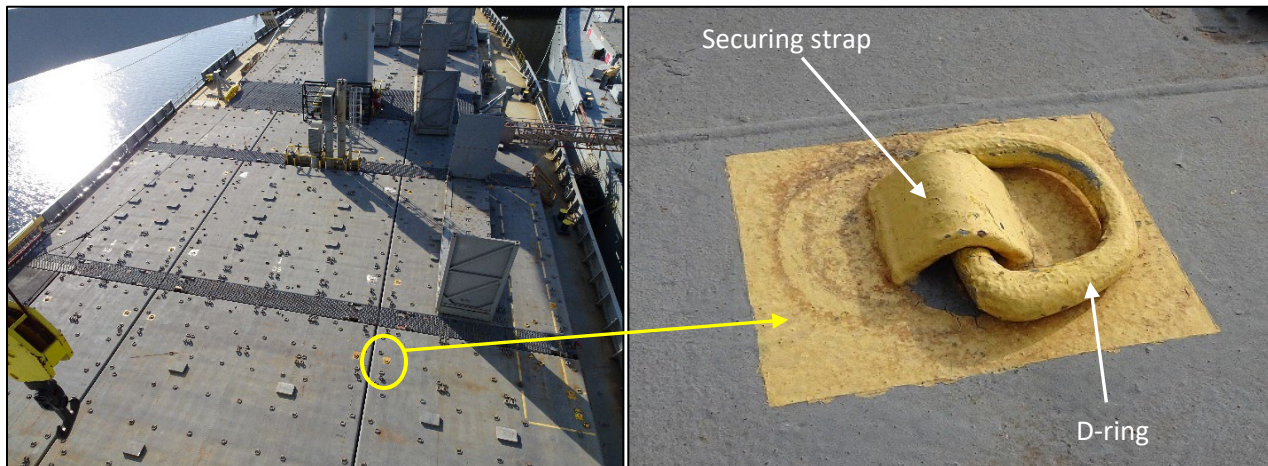


Figure 1. Deck Configuration

Figure 2. Example D-Ring Configuration

After the incident, the Coast Guard verified that the arrangement of the hatch cover lifting points were in accordance with all available drawings and design schematics. There were no records of any pull-tests or other testing conducted on these lifting points since their installation in the mid-1980s. There were also no records of any D-ring replacements, indicating that these have likely been in an exterior weather deck environment for several decades. Although there are requirements

for design and in-service testing of mooring fittings and cargo-handling cranes and associated gear, there are no prescriptive periodic testing or inspection requirements for general purpose D-rings or their securing straps. Consequently, similar failures may occur in the absence of an established inspection and maintenance program.



Figure 3. Separated D-Ring



Figure 4. Failed Securing Strap

The Coast Guard **strongly recommends** that vessel owners, operators, and other maritime stakeholders:

- Immediately identify high-risk D-rings and similar lifting-point fittings. High risk factors include: Age, weather exposure, and lifting load. These factors will cumulatively cause corrosion losses on the fitting, increasing its stress and fatigue vulnerability during each lifting cycle.
- Thoroughly inspect all high-risk lifting points for damage, hidden corrosion, and wastage. Audio gauging, pull-testing, or even replacement may be appropriate.
- Consult with the manufacturer's instructions to ensure safe lifting limits are in place and that the effects of service life are considered in their determination.
- Establish a maintenance schedule for periodically inspecting all lifting points and audio gauging or testing any fittings as they age into high-risk status.

Marine inspectors, investigators, and surveyors are encouraged to maintain an acute awareness of these issues and initiate corrective actions as needed.

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