

Lifting chains parted – hydrogen embrittlement

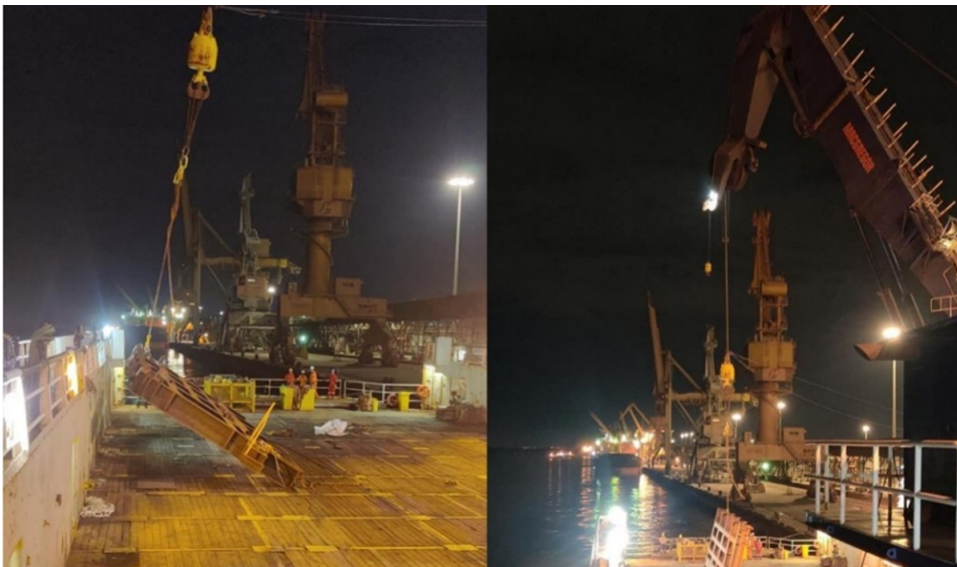
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Three of four lifting chains on a load parted while the load was being lifted.

What happened?

The incident occurred in the last lift of sections of grillage from a vessel involved in project demobilisation. At the time of the incident, the grillage was suspended, above the deck, by approximately 4 m.

Following discussion between the Deck Foreman and the Crane Operator, the grillage was slowly lowered down to the deck. There were no injuries.



What went right

- All the work was conducted in line with established risk assessments and with company lifting procedures.
- All the crew involved had the correct competencies.
- The rigging was only three months in use from purchase.
- The load was well below the Safe Working Load (SWL) of the chain.
- The chain was never deployed



subsea and was stored in a rigging locker.

What was the cause?

Analysis by an independent third party, and the chain manufacturer, concluded that hydrogen embrittlement, causing pitting, exacerbated by the tensile load on the internal radius of the links caused surface corrosion cracking, leading to internal branch cracking and failure.

Actions

The rigging was changed from a four-way bridle arrangement to slings and shackles, and the lift was completed safely.

Lessons and further information

- [UK HSE bulletin PM39 Hydrogen cracking of grade T and grade 8 chain and components](#)
- [WorkSafe Western Australia Health and Safety Bulletin No. 1 Embrittlement – Serious risk to alloy lifting chain integrity when lifting loads in a corrosive environment](#)

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