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Slow speed gantry crane derailment

What happened:

A rail mounted gantry crane, servicing visiting hauliers, had begun trolleying when the driver heard a loud noise from below and the crane came to a sudden stop. The driver contacted the engineering team for support who attended the scene and found that two of the leading crane wheels had become derailed from the rail.

The crane driver was advised to safely shut down the crane and exit the cab. Although there were no injuries sustained, this incident had the potential to be much more serious.



Key findings:

- The flange of one of the leading crane wheels had cracked and fragmented, allowing the crane to deviate from the crane rail.

- A torque imbalance between the long travel motors on the crane resulted in increased lateral loading on the crane wheels.
- The lateral loading led to increased wear and subsequent material loss to the crane wheels and the rail itself.
- When the wheel flange thickness reduced below a critical level it fragmented, leading to the derailment.
- Rail deflection had been previously observed, and ground investigation work also highlighted four soft spots along the length of the inward crane rail, where the rail foundations had deteriorated.
- Pre-incident crane wheels had been visually inspected monthly, but wear measurements were not recorded or compared.

Subsequent actions:

- Additional controls were introduced; including increased frequency of wheel flange thickness checks, the reduction of trolleying speed and a limitation to the distance travelled by the gantry crane.
- A project to replace existing long travel motors and eliminate 'crabbing' has been expedited.
- Work has commenced to stabilise the deterioration of concrete under the crane rail and strengthen the foundation.
- A significant portion of the crane rail has been identified for renewal.
- Periodic review of asset management and maintenance programmes will be conducted to ensure ongoing understanding of lifecycle and upgrade requirements.

Considerations for members:

Members may wish to consider the following actions:

- Assess their own rail mounted gantry cranes for similar issues.
- Review rail mounted gantry crane maintenance programmes to ensure inspection of wheels and motors is included at suitable frequency.
- Review asset management programmes to ensure that equipment and infrastructure lifecycles and upgrade requirements are considered.

PSS would like to thank Peel Ports Group for sharing the details of this incident and the related learnings at the base of this alert.