Significant Incident Report No. 289

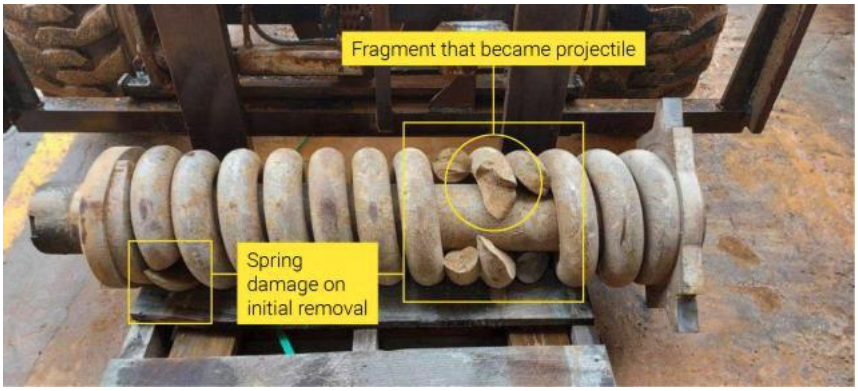
Subject: Damaged excavator recoil spring fragment became a projectile

Date: 11 January 2022

Summary of incident

In February 2021, a damaged recoil spring assembly for an excavator had been removed from the track arrangement and stored outside a heavy mobile plant workshop. The following morning, a fragment of the spring separated while under compression and travelled approximately 28 metres across the yard and through a workshop wall, coming to rest in a walkway beside a workbench.

The fragment, weighing 9 kilograms, penetrated the shed wall at approximately 6.5 metres above floor level. While employees located at the opposite end of the workshop heard a loud bang when the spring fragment impacted the wall, no persons were present in the areas where the fragment came to rest or outside where the spring was being stored.



Recoil spring after removal from excavator prior to incident.

Contributory causes

- The recoil spring assembly is designed to be installed and removed as a pre-assembled unit with the spring compressed/pre-loaded by approximately 58,000 kilograms of force.
- No information was provided by the original equipment manufacturer (OEM) on the potential hazards associated with performing work on the track recoil assembly with a damaged spring.
- Prior to removal, the recoil spring was inspected via the inspection window on the side track frame, which identified sections of the spring were cracked and missing.
- Although the spring had cracks and segments missing, the assembly remained under compression/load after it had been removed from the excavator, despite the integrity being compromised and susceptible to failure while under load.

L: Position of spring in storage yard when event occurred, with wall entry point.
R: Spring fragment final position on workshop walkway.

Actions required

The incident highlights the hazards associated with stored energy while working on equipment, and the need to ensure pre-loaded spring assemblies are managed and handled appropriately. The following actions are recommended:

- Ensure suitable safe systems of work are in place and followed when installing or removing pre-loaded spring assemblies.
- If spring damage is observed, where practicable, release all stored energy from the spring in a controlled manner prior to removal from the equipment.
- Develop and implement suitable controls to manage the potential stored energy hazard associated with the removal or dismantling of a damaged spring assembly.
- Ensure recoil spring assemblies are inspected and maintained as per OEM recommendations.
- Confirm workers performing maintenance and repair work are adequately instructed, trained and assessed as competent prior to conducting work.

Further information

Department of Mines, Industry Regulation and Safety

- Guideline – Isolation of hazardous energies associated with plant in Western Australian mining operations www.dmp.wa.gov.au/Documents/Safety/MSH_G_IsolationofHazardousEnergies.pdf
- SIR No. 169 Suspension component ejected under high pressure during maintenance – fatal accident www.dmp.wa.gov.au/Documents/Safety/MSH_SIR_169.pdf
- SIR No. 208 Bystander struck by component ejected from accumulator www.dmp.wa.gov.au/Documents/Safety/MSH_SIR_208.pdf

This Significant Incident Report was approved for release by the State Mining Engineer on 11 January 2022.