

Dropped Object During Hydraulic Jack and Pin Puller Operations

Description of Incident (May 28th, 2023)

The Drilling Maintenance Team on an offshore production facility were using a hydraulic jack and pin puller arrangement to remove the pins securing the luffing cylinder as part of planned maintenance on the Knuckle Boom Crane. Following four failed attempts with a 30-ton and 60-ton jack at max pressure, a larger 100-ton jack was utilized at half max pressure. On the fifth attempt the threaded rod connecting the jack to the pin failed, ejecting a 3 foot / 15 pound portion which travelled approximately 19 meters across the deck before deflecting off structural elements and coming to rest in a walkway approximately 26 meters below the Knuckle Boom Crane ejection point. See related images on page three.

Facts/What Went Wrong

- The Subcontractor-provided threaded rod and 60-ton jack was sent to the platform for this work activity.
- Both the 60-ton & 100-ton jacks were capable of exerting force in excess of threaded rod yield strength.
- Contractor procedure being utilized did not specify the hydraulic jack to be used, the load rating of the provided rod, or sufficiently describe steps to take if pin removal efforts were unsuccessful.
- The threaded rod was exposed to tensile loads above its yield rating during each of the three 60-ton pulls.
- The job safety analysis did not identify threaded rod parting as a potential hazard; the ejected rod travelled beyond red zones established to manage dropped object risk.

Root Causes:

- Post-incident lab analysis confirms the threaded rod failed due to exposure to force greater than yield strength.
- The crew was not aware of yield load rating for threaded rod or recommended operating limits for the hydraulic jacks.

Corrective Actions & Recommendations

- Revise procedure to include (1) specifics including load rating and safe operating pressures specific to threaded rod and hydraulic jack being utilized, and (2) what to do if safe pin removal efforts are unsuccessful
- Ensure pin-pulling equipment is independently verified as fit for use prior to mobilizing
- Update job safety analysis to include threaded rod failure/ejection as potential hazard
- Consider alternative equipment designs to reduce risk of threaded rod failure

The following “Learning Questions” have been developed by the operator involved in this incident. The operator encourages individuals to consider the following questions:

- What information should be available to you about your tools and equipment?
- Are your work instructions clear on what tool to use and what to do if the task doesn't go as planned?
- How do hazards and error prone situations get transitioned to guidance for task execution?
- How can your procedure be improved to make the task easier to get right, harder to get wrong?
- At which task steps should you pre-plan hold points to confirm safeguards are in place before proceeding?
- What examples of specific & observable conditions or behaviors would indicate that a hazard is present?

Applicable Lifesaving Rule

IOGP's [Line of Fire](#) lifesaving rule includes best practices that relate to this safety alert.

Posted on July 31, 2023

[Read more](#) Atlantic Canada Offshore Safety Alerts.

Related Images

