

Object Falls from Height

Enform

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Description of Incident:

- This incident occurred at a drilling rig during standard drilling operations.
- At the conclusion of a cementing operation, and during tripping and laying down the cementing pipe string, the drilling crew discovered a 25.4 cm diameter, 0.68 Kg brass thrust washer lying on the ground on the rear of the drill floor (Fig. 1).
- The washer had fallen from the inside of the top sheave in the crown assembly of the rig derrick, missing the nearest worker by 2 meters.
- A visual inspection, performed by crew from the ground using a camera with a telephoto lens, identified that the sheave pin (which forms the axle for the sheave) had moved laterally and the sheave was noticeably leaning from its normal, vertical position. (Fig. 2)



- 25.4 cm diameter, 0.68 Kg brass thrust washer

Figure 1

- A crane equipped with a man basket was mobilized so that personnel could access the crown to inspect, render safe, and repair the damage.
- At this time it was observed that the outer sheave locking plate bolts had sheared and the plate itself was seen resting on the edge of the crown assembly.
- These conditions created the potential for a more serious incident, necessitating a suspension of rig operations.

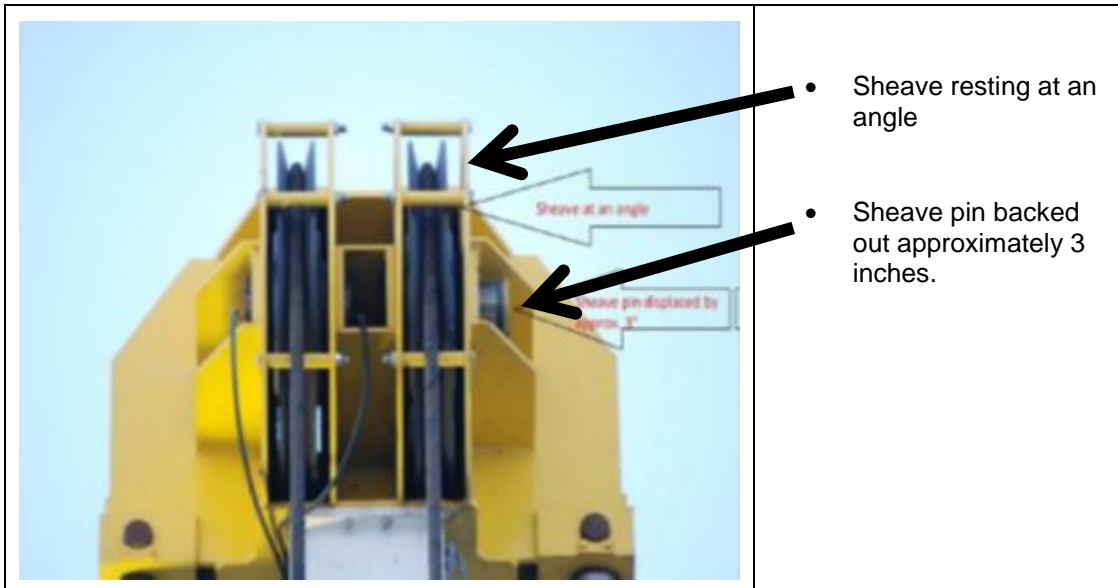


Figure 2

What Caused It:

- The bolts that secure the locking plate in place on the crown housing became loose over time. As a result the locking plate was making contact with the sheave pin. This continued movement from the sheave pin onto the locking plates resulted in wear on the locking plate bolts and caused the subsequent failure of the bolts.
- Restricted access to locking plates did not allow workers to clearly identify the backing off of the locking plate bolts.
- A review of product specifications did not indicate the requirement to torque the crown pin keeper plate bolts to a specified range; or to perform inspections on this area of the rig on a prescribed basis.

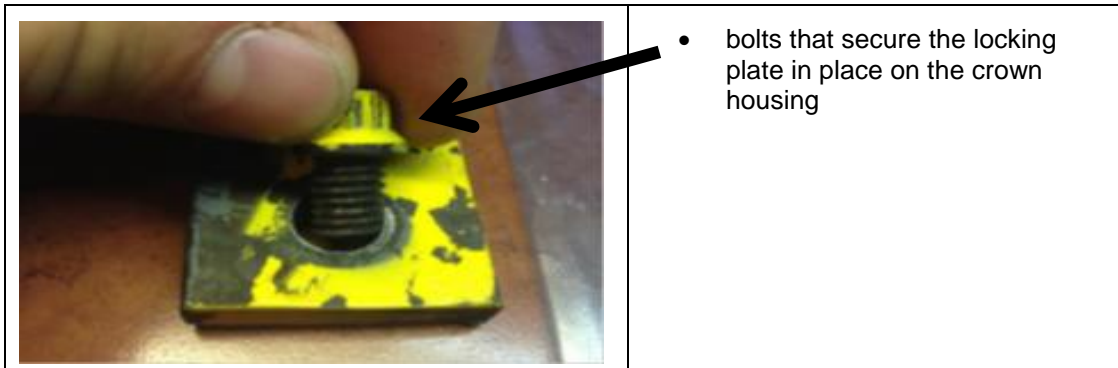


Figure 3

Corrective Actions:

- Installed Nord-Lock Washers and Loctite on all lock plate bolts.
- To ensure bolts are secure prior to each time the derrick is raised, the lock plate bolts shall be torqued to 41 lb-ft. and this procedure will be captured in the corresponding JSA/SOP for completing a pre-raise derrick inspection and in the inspection itself.
- Although the crown inspection that was completed prior to the incident was thorough it was generic stating that "all crown bolts are secured and in good repair", the inspection document has been updated to specifically identify the need to inspect each locking plate and the corresponding bolts.
- This style of the derrick does not allow access to the crown when it is in the raised position. Rig Managers will be provided with binoculars to inspect the crown assembly, specifically the sheave pins from the ground level during daily walk around inspections.

Diagram of Crown Assembly

Upper Sheaves
P135-2804

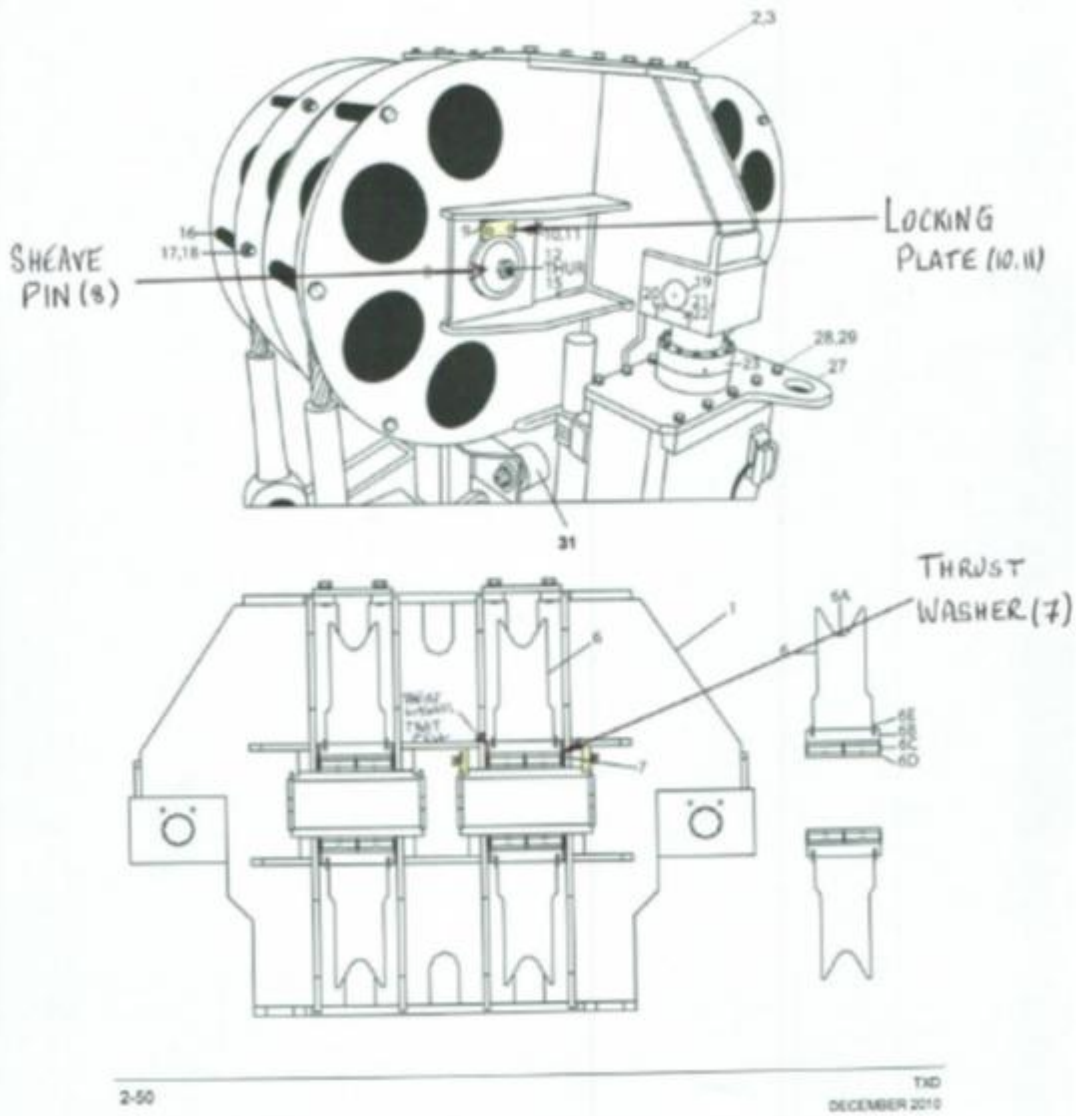


Figure 4