

## CATASTROPHIC FAILURE OF MUD CENTRIFUGE

**ALERT 5-20**

### WHAT HAPPENED:

While processing drilling fluids, a mud centrifuge (Fig. 1) experienced a catastrophic failure resulting in the ejection of the pillow block bearing assembly. The 65 lb. assembly traveled approximately 190 ft before striking the steps of a living quarter trailer (Fig. 2). The gearbox, back drive electric motor, coupler and associated components were also dislodged from the frame but remained within the confines of the centrifuge platform.



Fig. 1 - Failed Centrifuge

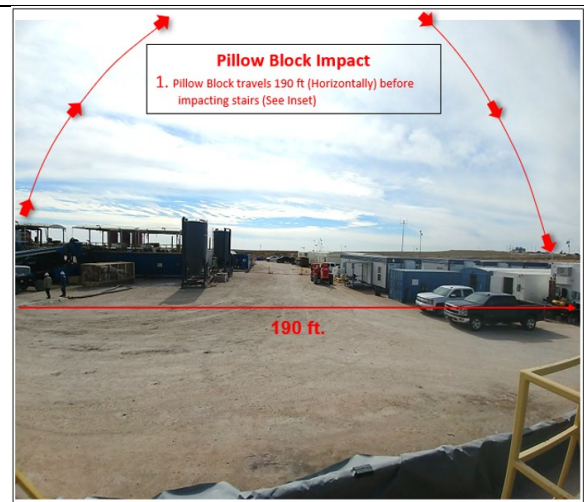


Fig. 2 - Bearing Trajectory

### CONTRIBUTING FACTORS:

- Inadequate maintenance at third-party facility
  - Three of twelve gearbox adaptor flange bolts installed at a third-party maintenance facility were found to be of insufficient length
  - Fit between hub and gearbox flange that had been incorporated into this machine to reduce torque on the flange bolts had been machined out, without consultation with OEM
- Vibration sensor on unit was non-operational
- Protocols for verifying and maintaining bolt torques were inadequate
- The gearbox restraint system was inadequate and did not prevent dislocation of the gearbox from the confines of the frame

### LESSONS LEARNED:

- Functional verification of safety critical sensors should be conducted before utilizing any piece of machinery
- Implement torque verification protocols during routine maintenance
- Consider installation and verification of effectiveness of secondary restraints on exposed rotating components