P.O. Box 577
Brookshire, TX 77423
U.S.A

WEST ENGINEERING SERVICES
ISO 9001 Certified

Tel: (281) 375-5515
Fax: (281) 934-1600
west@westengineer.com

TECH TIDBITS, vol. 18

Should You Clean Your New Equipment?

A newbuild rig was having problems with corrosion and debris in the conduit lines, the auxiliary lines, the risers, the blind shear and casing, and the test stump.

Description of Issue

During a rig inspection, grease was found in the hydraulic conduit lines on the rig (figure 1). A hydraulic line box end had grit and an anti-seize material in the inner diameter (figure 2). The auxiliary lines, pins, and boxes did not have any protection installed on them.

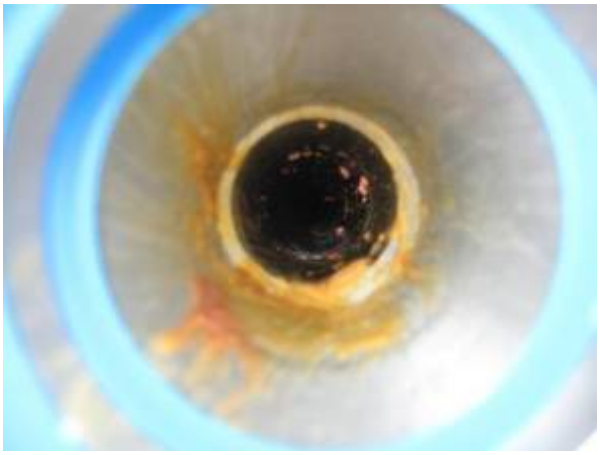

Figure 1: This hydraulic line box end has grease in the inner diameter.

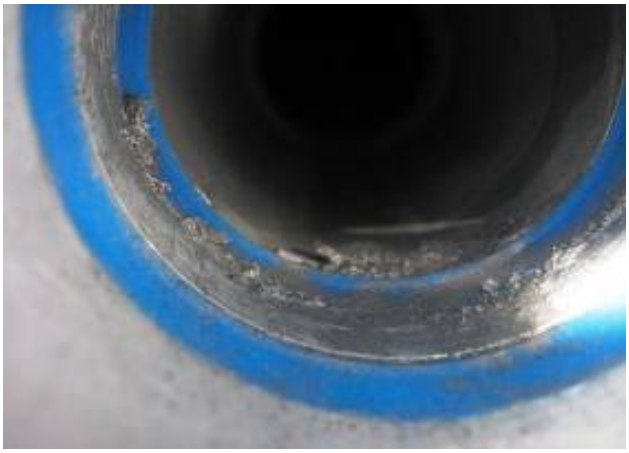

Figure 2: The hydraulic line box end has grit and an anti-seize material in the inner diameter.

In addition, riser joints that arrived on the rig from ashore had no protectors installed on them. A visual inspection found debris in the auxiliary lines. Also, black blast grit was found in the conduit lines. The riser joints in storage had no pin protectors installed on them (figure 3). One of the risers was made up with the slip joint and placed in the spider. The riser was flushed with about 1¼ times the volume of the riser with seawater by pumping through the top drive. A good bit of debris was seen being flushed from the riser.

A borescope was used to visually inspect the inside of the BOP (blowout preventer). Debris was found in the blind and casing shear cavities. In figure 4, the yellow arrow points to debris on the blind shear ram's lower blade. This photo was cut from the borescope video during inspection. The blind and casing shear doors will need to be opened to find and remove the debris. When the doors were opened, caked blasting sand was found. There was caked blasting sand seen in other places inside the BOP as well. Therefore, all the bonnet doors were opened on the BOP to clean out all the debris inside the cavities (figures 5 and 6).

There were also problems screwing into the test stump. Debris inside the stump required the BOP to be taken from the stored position and put on the transporter lift to clean the stump. Figure 7 shows the inside of the test stump where the crossover makes up. Figure 8 shows this body, normally screwed in from the bottom of the stump, removed from the stump. The red and blue arrows in figures 7 and 8 are pointing to the same areas on the stump body. The red arrows in figures 7 and 8 point to where the crossover screws into the stump. The guide funnel, indicated by the yellow arrow in figure 8, was removed to clean the stump.

Figure 3: The risers have no protectors installed.

Figure 4: Debris on the blind shear lower blade.

Figure 5: Red arrow shows caked blasting sand on the starboard blind shear ram block.

Figure 6: The red arrows show caked debris on the pipe ram's cavity.

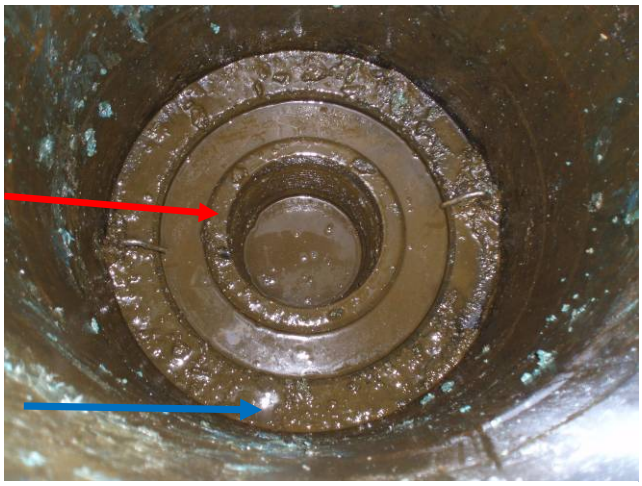

Figure 7: The inside of the test stump.

Figure 8: The body removed from the test stump.

Conclusions

The riser joints already onboard the rig should be fully cleaned. The riser joints also need to be protected when transferring them to the riser bay. Protectors should be installed on the pin and in the box ends of the auxiliary lines. Main pin and box end protectors should also be installed. Protectors will aid in minimizing damage and keeping dirt and debris out of the auxiliary and conduit lines. The hydraulic lines especially need to be free of dirt and debris. Dirt and debris from the conduit lines could eventually end up in the BOP control system, which can lead to failures in places like solenoid valves, orifices and filters. This can result in very costly downtime.

The scale in the BOP probably would not have been present if this was a drilling well. In this case, the BOP was new and had a lot of grease and scale.

Keeping the auxiliary lines, hydraulic conduit lines, and risers covered and clean will help keep debris out of the rams. If there is debris in the rams, downtime could occur. The rams would have to be opened to remove the debris. A borescope can be used to inspect the rams for debris and corrosion before sending the BOP stack down-hole.

It is a recommended to wash the bore of the BOP with a wash tool after pulling, and before setting it in the setback area for maintenance. This procedure would wash out annular and ram cavities as well. It would also help prevent lost time cleaning out the test stump. Just be careful to follow manufacturer's recommendations on pressure to the wash tool, to avoid damaging BOP rubber and seals.

For more information or technical questions, please contact WEST Engineering, **west@westengineer.com**, or call **281-375-5515**, or visit our website at **westengineer.com**.