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'Providing Tribological Solutions'

INFORMATION NOTICE

MOV LONG LIFE – LIMITORQUE SMB GEARBOX GREASE SERVICE LIVES AND COST SAVINGS

Grease samples were taken during a November 2009 refueling outage. They have been using MOV long Life grease since early 2000 and the samples were from the harshest environment of all installed MOV's. The temperatures are from probes installed on the drywell 4th floor at several locations, not directly on the actuators. These valves are located inside the Drywell (primary containment) at the highest elevation (4th floor) with normal operating ambient temperatures in the range of 170°F to 205°F in a Nitrogen (inert) atmosphere. The valves are normally open with a path to the Reactor Steam Volume, but no active steam flow through the line, since the lines are isolated downstream. The valves are stroked on a quarterly basis when online and 3-10 times during their refueling outages (2 year fuel cycles).

High Pressure Coolant Injection (HPCI) Steam Supply In-board Containment Isolation Valve. The valve is a 10 in. Crane flexible wedge gate valve with a Limitorque SMB-2-60 actuator. This actuator had to be rebuilt every refueling cycle based on the degradation of the previous used lithium thickened Grade 0 grease during the two year period. The grease was normally very degraded with burnt smell and black. They installed the MOV Long Life in this actuator in the fall of 2001. They take a sample every cycle to monitor for degradation. During the November 2009 outage, the actuator grease level was a little low and graded as a 2 (Carmel to Dark Tan), so some grease was added. This is now 4X longer.

Isolation Condenser Steam Supply In-board Containment Isolation Valve. The valve is a 14 in. Crane flexible wedge gate valve with a Limitorque SMB-3-150 actuator. This actuator also had to be rebuilt every refueling cycle based because of the previously used lithium thickened Grade 0 grease. The grease was normally very degraded with burnt smell and black. They installed MOV Long Life in the fall of 2003 and have had good performance since. They continue take a sample every cycle to monitor for degradation. During the November 2009 outage, the actuator grease level was satisfactory and graded as a 2 (Carmel to Dark Tan). This is 3X longer.

Testing on the samples showed that both greases will still fit for service but based on the color change it was suggested that they be changed at the next outage. This meant services lives of 5X and 4X longer for the above applications.

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Cont'd

Cost Saving; The rough estimates are for what it took to rebuild each actuator every outage. The parts costs are not high, but the labor time is very high.

Overhaul our spare prior to the outage	24-48 hours
Transport the new actuator using refueling crane	4 hours
Determinate the installed actuator	8 hours
Remove installed actuator	8 hours
Install new actuator	8 hours
Re-terminate the new actuator	16 hours
Diagnostic test new actuator	24-36 hours
Transport the old actuator using refueling crane	4 hours
	Total 96-132 hours

This is for EACH actuator, so basically 200 hours every outage.

Cost: Using $75/hr $15,000 in labor, with probably another $1000 for parts. At 4 times the life this is $60,000 per actuator!

Plus, the scheduling is critical to outage execution, since the work window is limited on this equipment beause of the high temperatures (>100°F for much of the outage periods) and restricted access during any fuel moves. Consequently any maintenance issue can significantly delay our outage, which starts to mean REAL $$ very quickly.

Summary: The use of MOV Long Life grease has resulted in considerable cost savings with grease lives many times that of the previously used grease.

The above information is provided as an example at one particular station. While similar performance might be expected there is no guarantee and the use of extended grease changes should be accompanied by the appropriate condition monitoring of the grease and the MOV.