

# Better Pump Protection at a Reduced Cost

One major Alberta SAGD operator drew its process water from a deep source well (500-600 meters) containing brackish water. The water had a high chloride content and was contaminated by solid particles finer than beach sand. It was not possible to detect these water quality issues prior to drilling the well.

Maintenance personnel detected repeated jamming of the Automatic Recirculation (ARC) valves protecting three centrifugal pumps that were used to introduce make-up water into the process. In addition, the valves' springs would become brittle and disintegrate. The cause of the jamming was due to the build up of sand contaminants. The cause of spring failure was undetermined. Either issue would result in valve failure. Maintenance personnel also observed pitting of the valve body.

Each valve would fail as often as every 3 weeks. In order to service a valve, maintenance personnel would use a truck-mounted picker to remove the valve from service and transport it to a maintenance shop. There, it was opened, cleaned, and, if necessary, the springs were replaced. The serviced valve was then returned to the unit, where it was reinstalled.

Servicing did not result in production downtime, as the two other pumps could handle the workload; however, it was a costly undertaking involving approximately one

full worker day per valve. The cost of the replacement springs was approximately \$1,000 each. The entire process took two days from start to finish, repeated as often as every 3 weeks for each of the three ARC valves.

## Solution

Unsatisfied with the frequent failure and costly servicing of their ARC valves, plant personnel actively sought an alternative and were introduced to the HORA ARC valve. HORA's top entry design enabled the valves to be opened and cleaned without removal from the line. Parts could be replaced in minutes by simply removing the bolted cover, removing the check valve insert assembly, installing replacement parts, and replacing the cover.

Whereas the original ARC valve was only available in one material, the spring and trim materials on the HORA ARC valve were customizable. HORA also offered 75% faster lead times and a significantly lower unit cost.

## Impact

Over a two-year trial period, maintenance personnel observed no pitting of body surfaces or disintegration of check valve insert springs on the HORA ARC valves. The valves proved themselves to be durable and offered



## Summary of Impact

Criteria	Original ARC	HORA ARC
Worker-hours to service	19 hrs	<1 hr
Total repair time	2 days	<1 hr
Cost of replacement spring	\$1000	N/A
Average time between repairs	3 weeks	
Delivery lead time	22-26 weeks	16-18 weeks
Custom material	No	Yes



Fig 2. Top-entry, in-line serviceable

considerable maintenance cost and time savings. HORA is exploring modifications to further improve valve performance in this challenging service.

Not only did the HORA ARC valve lower capital and maintenance costs for this major SAGD operator; it can be easily inspected and serviced, and its body castings reduce delivery times and costs. For these reasons, it has become the operator's preferred ARC valve for pump protection.



Fig 3. Check valve insert spring intact



Fig 4. No evidence of body corrosion