

CUSTOMER SUCCESS STORY

BENTLY NEVADA* ASSET CONDITION MONITORING

GE RECIP COMPRESSOR MONITORING SOLUTION SAVES \$\$ FOR LARGE TEXAS REFINERY

Early warning and accurate diagnoses by System 1* software helped make the right decision to work on the compressor during a hydrocracking unit shutdown. Investment in GE's Reciprocating Compressor Condition Monitoring Solution resulted in real cost savings.

PROBLEM

Three six-throw, balanced-opposed horizontal reciprocating compressors provide makeup hydrogen for the catalytic cracker unit at a large refinery in Texas. All three compressors must operate in parallel to run the unit at full capacity (approximately 350K bbl/day). Loss of one machine results in a 20% reduction in production, which can have enormous economic repercussions.

SOLUTION

The plant invested in a GE reciprocating compressor monitoring solution consisting of GE Energy's Bently Nevada 3500 Series Machinery Protection System, transducers, and System 1 diagnostic and optimization software. The solution includes the Impulse/Impact RulePak, designed specifically to detect faults due to mechanical looseness. This is particularly important for recip condition monitoring as loose piston nuts are a frequent occurrence that may result in high repair cost and extended downtime.

PAYBACK

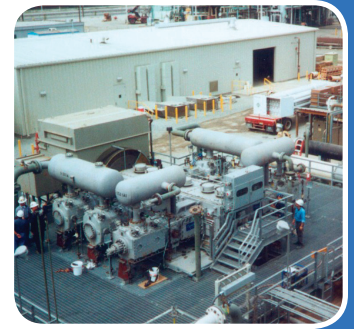
The plant saw a significant return on their investment soon after deployment. Following an overhaul of a recip compressor unit in March, a knock developed on the 2nd stage low pressure cylinder when the unit was put back into service. The Impulse/Impact RulePak software locked onto the anomaly and issued a Severity 3 Danger - Loose Piston RulePak notification prior to any protection alarms. The magnitude of the knock continued to increase, and one month later in mid-April, the Machinery Protection System issued a Direct PK vibration alarm.

Based on data collected and analyzed by System 1 software, machine specialists decided to shut down and inspect the unit to determine the cause of the knock. The inspection proved the loose piston nut diagnosis by the RulePak software was correct and confirmed the loose piston nut as the root cause.

System 1 software was credited with the machine save by providing early warning prior to any protection alarms. It provided critical insight into the compressor condition, allowing the plant to understand and diagnose the compressor condition. Even if the failure had progressed to the level of an audible knock, detection of the loose piston would have been extremely difficult without quality data to guide the disassembly and inspection process. Had they attempted to run the recip compressor until the unit shutdown in May, it was quite possible the piston nut would have loosened further, caused severe damage and resulted in additional maintenance costs and downtime.

BENEFITS

- **Positive identification of mechanical looseness** through proven deterministic methodology results in less time spent searching for faults and faster resolution.
- **Early notification and managing below protection alarm limits** facilitates better planning for unscheduled outages, resulting in shorter downtime and lower production losses.
- **Continuous online monitoring** captures vital data that may otherwise be missed. With a complete picture of the machine, condition analysts can more quickly identify root cause to avoid further machine damage and production losses.



System 1 Software



Bently Nevada
3500 Machinery
Protection Systems

