

# EMERGENCY SUPPORT

AN EXAMPLE OF HOW GE HELPS CUSTOMERS IN THE OIL AND GAS INDUSTRY

## GE Emergency Support Helps Prevent Major Outage.

GE's Bently Nevada\* team has a Supporting Services Agreement (SSA) with a petrochemical plant in the Middle East. The agreement, which includes periodic machinery health monitoring and emergency support, recently helped avoid a major outage and significant damage to critical machinery.

### PROBLEM

Recently a GE machinery diagnostic (MDS) engineer received a 10 p.m. call from a petrochemical customer in the Middle East. The customer requested emergency support to diagnose a high vibration trip on an axial flow critical compressor driven by a steam turbine. The customer did not have remote access support setup for System 1\* monitoring and diagnostics software, so the GE engineer was immediately mobilized to the site to investigate.

### SOLUTION

By reviewing System 1 data, the engineer discovered that a change in the rotor's balance condition was causing the high vibration trip incident. The MDS engineer recommended that the customer inspect the internal components of the rotor.

Though the customer's maintenance team agreed with the GE engineer's analysis, the onsite production team preferred to run the machine again, so the production department performed an offline wash on the compressor and proceeded to start it up, but the compressor did not pass through the first critical speed without tripping on high vibration. The GE engineer onsite warned the customer that another start might damage the stator blades, and no spare stator was available, so the customer heeded the warning and decided to open the compressor to inspect the rotor's internal components as originally suggested.

Upon inspection, the team discovered a piece of the third stage blade was missing from its root. The released blade had already damaged three more blades on the same row and was starting to rub against the stator. Since there was no damage to the stator itself, the bad rotor was replaced, and the machine started successfully.

Additional analysis completed through a review of past System 1 data revealed that this machine had a history of surge events while coasting down with high vibration, especially during an abnormal process upset. The team concluded that the blade failure could have been due to repeated stress during past surge events. At the behest of GE, the supplier of the compressor control system and original equipment manufacturer were invited to the site to investigate the compressor surge. The combined team had many recommendations, which are now scheduled for implementation during the next major outage to prevent surge events in the future.

### PAYBACK

The customer received decisive advice on the risk of continued operation and a clear recommendation to inspect the turbine. Major additional machine damage was avoided, which was critical as a spare stator was not available. Any damage to the stator would have put the plant production at risk for a minimum of six months. Plant management sent an appreciation letter to GE thanking the team for the speed and accuracy of the technical support and recognizing the overall high quality of service.

### BENEFITS

- **Avoided costly downtime:** stator damage would have risked six months of plant production.
- **Uncovered underlying issues:** customer asked GE's Bently Nevada team to act as a technical consultant for root cause analysis, which identified a persistent problem that may have otherwise gone undetected.
- **Fast Response:** immediate support resulting from an SSA agreement.



Machinery Diagnostic Services (MDS)



System 1\* Software



Supporting Services Agreement (SSA)

