

CASE STUDY: Interference

Summary

A hydrogen compressor at a refinery began producing a knocking sound after an overhaul and the Tech Services group at Windrock was asked to provide analysis of the data collected by the customer. Our Tech Services team confirmed the knocking was caused by a piston striking a cylinder. The OEM was responsible for repairing the piston and Windrock was able to save the customer thousands of dollars and avoid a major catastrophe.

Background

Machine operators with a large refinery began hearing a loud knocking sound from a compressor during the warm-up period after an overhaul. Once warmed up, the knocking sound disappeared. During the next start up, data was collected with a Windrock portable analyzer from the machine while the knock was occurring.

Technology

The compressor was analyzed by the customer using a Windrock 6320/PA. After reviewing the data, the customer believed the knocking sound was caused by a head knock (Figure 1). The customer contacted the manufacturer who disagreed, claiming that it was not possible for that to happen and they would need a second opinion before taking any action. The customer then sent the database to Windrock Tech Services who confirmed without a doubt that the data was showing a head knock.

Findings

The compressor was taken apart and the results of the impact could be viewed and photographed. It was clear that the piston was hitting the cylinder, as the piston's model numbers were stamped backwards into the cylinder (Figures 2 & 3). As a result of these findings, the Manufacturer paid to have the piston machined 0.060" in order to eliminate startup impact. This saved the refinery an estimated \$500,000 in repairs had the machine suffered a catastrophic failure.

Figure 1 - Data from 6320/PA showing head knocking

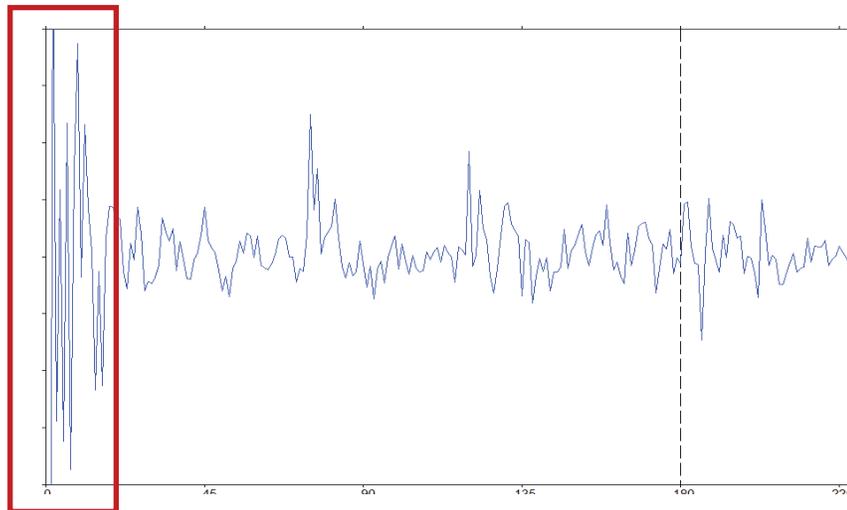


Figure 2 - Piston with Manufacturers Product Code



Figure 3 - Cylinder Head with Piston Product Code "Stamp"