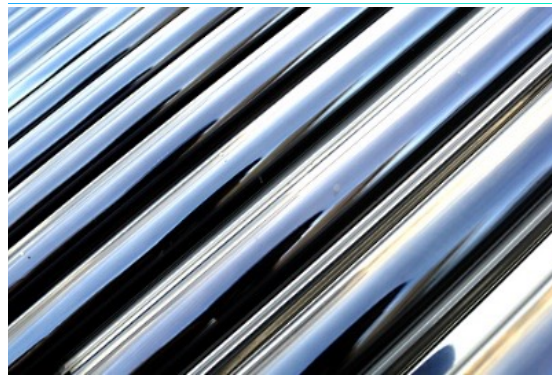


Analyst detects bearing failure from 2,300 miles away

When a bearing in a roll stand gearbox failed without warning, a major US specialty steel producer escaped major gear damage and lengthy downtime thanks to cloud computing.

This East Coast steel mill collects its own vibration data on a regular schedule and then uploads it over the Internet to a skilled analyst, located in Seattle, WA. In this case, the mill uploaded vibration data from two, eight-stand rolling modules on a Sunday. The mill relies on the 16 critical roll stands to produce various size bars of specialty steel.

The analyst received an email notification of the upload and logged in over the Internet from his Seattle home that same day for an initial review. To his surprise, vibration from one of the vertical stand's planetary gearboxes was so random, it could only be described as "noise." For gearboxes, this is almost always a sign of bearing failure.



The analyst immediately notified mill personnel and strongly recommended the machine be shut down to minimize consequential damage. An undetected bearing failure can completely destroy a gearbox.

After shutting the module down, the mill inspected the suspect gearbox and found that one of the bearings had completely failed and destroyed the cage. None of the gears were damaged.

This failure was unusual because the previous set of data from the gearbox — collected just a few months earlier — was normal. Generally, bearing wear is a gradual process that is clearly evident in vibration readings as it degrades. In addition, oil samples analyzed around the time of the failure did not show any trace metal increases. This is also unusual because as a bearing degrades, tiny metal particles usually rub off into the oil for several months prior to a failure. The absence of vibration anomalies and no increase of trace metals in the surrounding oil suggest the bearing failure was sudden.

The mill had a spare gearbox which they were able to rebuild and swap out with the damaged one in just 50 hours. Since the damage was confined to one of the two rolling modules, the other was able to swap to a different size bar to keep production rolling. In total, the mill suffered just eight hours of downtime.

The ability to share data via the cloud made all of the difference. Without a vibration data collector that could collect data and transmit it to the cloud, the analyst would have had to travel to the plant — likely on Monday — to review data. Even if the analyst was locally based, it may have been too late.