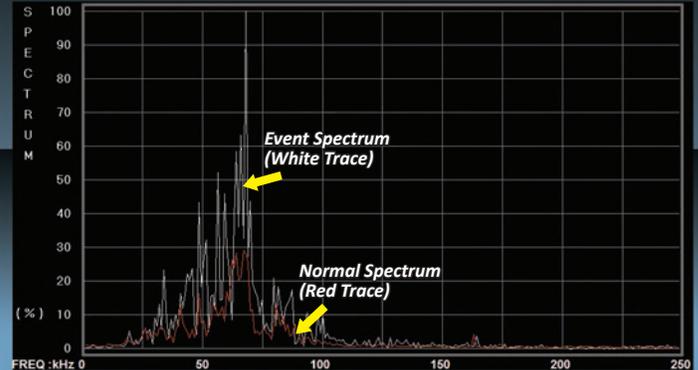


SENSOR 34 ACOUSTICS



SPECTRUM 34 DURING EVENT

Leak History #44 High Pressure Feedwater Heater Valve

The vent valve issue occurred on a High Pressure Feedwater Heater equipped with a single metalborne waveguide welded to the tube shell just behind the tube sheet. The heater feeds a 677MW Hitachi Supercritical unit.

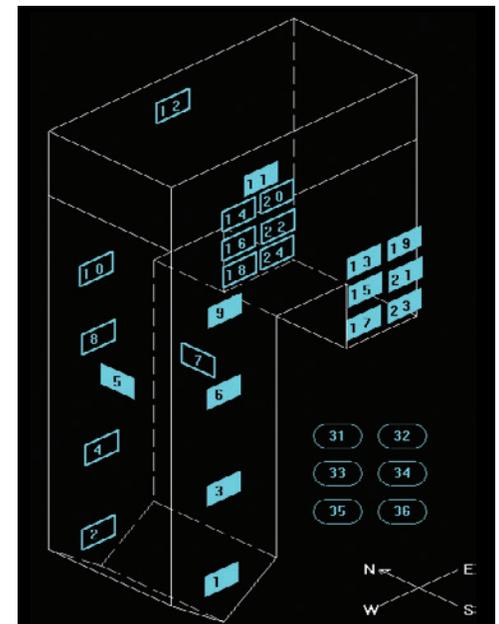
The plant noticed an unusual step increase on sensor 34, a feedwater heater sensor, and asked MISTRAS | Triple 5 for additional analysis. The MISTRAS | Triple 5 analyst reviewed the data and compiled a report*; specifically asking the plant if there were any valve changes or vent openings at the time of the step increase, 29 June 19:20. With that guidance, the plant then proceeded to investigate operational changes at the time of the step increase.

While reviewing the shift summary report, the plant noted that the heaters and DA vents were opened at the time of the step increase for a period of five minutes. Operators then physically inspected the vent valve and discovered there was a “hissing” sound emanating from the vent. The operator was able to reopen and reseal the valve, causing the “hissing” to stop. There was a corresponding drop in the acoustics and, given the valve was difficult to manipulate, a work order was entered to replace the valve.

Other than the AMS, the plant had no indications of a malfunction with the valve. Improperly seated valves can lead to pressure drops within a Feedwater Heater. When the pressure within a heater drops, the potential for flashing increases, which can lead to significant secondary damage in the form of OD erosion, increased vibration of tubes, etc. In addition to flashing, a misaligned valve can also lead to the dissolved gas content changing in unpredictable ways, which can lead to oxidation of the tubes (and further issues with the unit/turbine). A leaking valve also adversely affects the heat rate of the system by venting BTU’s to the environment that would otherwise be recycled and utilized by the plant. By detecting the malfunctioning valve early on, the plant was able to fix the issue and repair the problem before any of the aforementioned secondary problems could manifest.

**Sensor 34 signal stepped to 97dB, from 89dB, 06/29/16 1920 and is currently trending near 94dB. The spectrum shows narrowband lifting from the reference 50kHz – 75kHz bandwidth at this time. Current levels are higher than the past 60 days. Were there any operational changes at that time (06/29/16 1920) that we can correlate to the acoustics? For example; level changes, valve position changes, vent openings, etc.? Recommend walking the heater as well as continued monitoring.*

- Problem:** Vent Valve
- Boiler:** High Pressure Feedwater Heater
- Equipment:** Single Metalborne Waveguide



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