



Catch of the week



Combustion Problem Found at Combined Cycle Power Plant

Availability & Performance Center | May 2012

What did the SmartSignal software find?

On March 6th, the Proficy SmartSignal solution detected an issue with three combustion turbine exhaust thermocouples during a steady state run that was the turbine's first run after a hot gas path inspection. As this combustion turbine varied load between 100 and 155 Megawatts, intermittent deviations appeared in thermocouples 3, 4, and 6. The exhaust thermocouples were expected to have values between 1100 and 1200 degrees Fahrenheit. Actual temperature measurements varied as much as 100 degrees below expected values.

Combustion health is monitored using exhaust thermocouples and a swirl pattern that will vary with airflow changes that are associated with load changes. Since the deviations in the thermocouples were changing, as the load of the machine was changed, the Availability & Performance Center performed a swirl analysis to assist in narrowing down a possible combustion issue. It was suggested to the client that there was a possible combustion system issue associated with cans 11, 12, or 13.

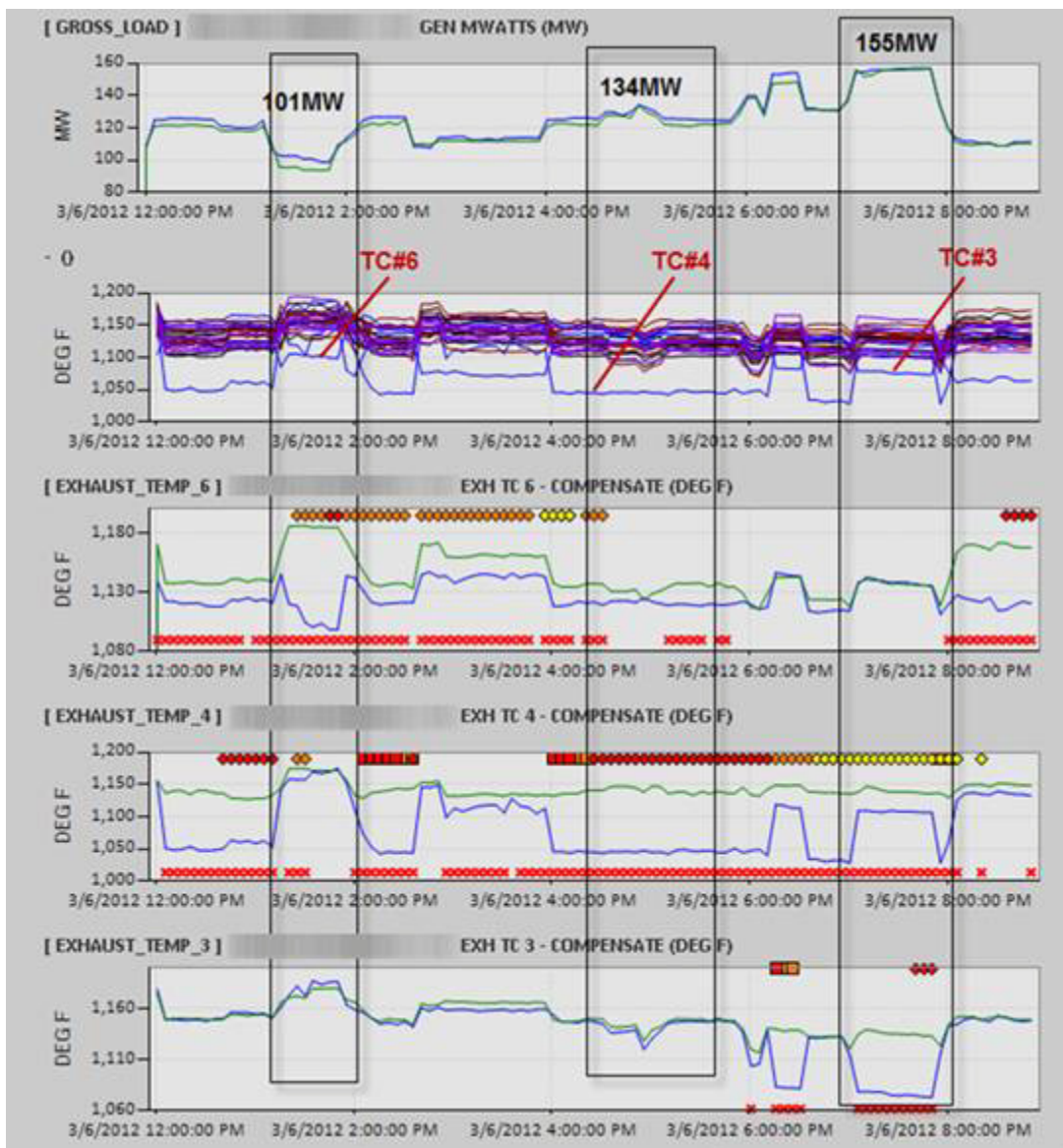
What was the underlying cause?

Since this hardware was just replaced, the client was very interested in further evaluating this combustion issue with the OEM. The OEM investigated and eventually replaced combustion nozzles 12 and 13 during a subsequent planned maintenance outage. These 2 combustion nozzles have been sent out to be inspected and repaired as needed.

What was the value to the client?

Finding this issue early, helped ensure that the client did not take a forced outage during their summer run season. This particular client is under a long term service agreement so they were not liable for the replacements costs of the combustion nozzles. However, the client was very appreciative that we were able to find this issue now and allow them to address it during a planned maintenance outage. The client estimated that by detecting this issue now, and preventing this issue from affecting them during the summer peak season, the client was able to avoid more the \$350,000 in lost power production revenue.

Who found it? Eric Logis and David Saad



Screenshot depicting increases in actual (blue) versus expected (green) power for combustion turbine power [TOP], actual exhaust temperatures [SECOND FROM TOP], and actual (blue) and expected (green) values for exhaust temperatures [BOTTOM THREE].