

Beamex Case Story

Siemens Energy Fossil - Field Service
United Kingdom



An improved method provides time-savings when performing tests for power generators.

beamex

THE FIELD SERVICE DIVISION OF SIEMENS ENERGY FOSSIL PERFORMS SERVICE AND REPAIR OF ELECTRICAL POWER GENERATORS IN THE UK AND WORLDWIDE.

Siemens is one of the world's leading suppliers of components and systems to companies in the energy and electricity industry. With roughly 83,500 employees, Siemens Energy Sector had sales of over EUR 12 billion and received new orders for approximately EUR 22.6 billion in fiscal 2007. Siemens Energy Fossil is a division of Siemens Energy Sector. Siemens Energy Fossil - Field Service in Nottingham oversees the repair, service and upgrade of Siemens gas and steam turbine generators in the UK, including the Parsons steam turbine generators that are still in service across the globe, as well as other non-Siemens manufactured equipment. This work is undertaken primarily for electrical utilities and other industrial customers.



Specific tasks of the Siemens Energy Fossil - Field Service, are to service and repair hydrogen and water-cooled electrical power generators in the UK and worldwide. Andrew Reynolds is a service engineer at the Siemens Energy Fossil - Field Service.

The situation

Typical equipment serviced by the Siemens Energy Fossil - Field Service is the Siemens generator. These generators, with water-cooled stators and hydrogen-cooled rotors, are optimal for large steam and nuclear power plant applications ranging to more than 2000 MVA.

Explaining their testing requirements, Andrew explains, "As part of the service, and prior to commissioning of the machine following servicing, we perform pneumatic and vacuum tests on the water cooling circuit. When in use, the water circuit generally operates at 3 bar, the water-cooling circuit is in an outer casing (pressure vessel), which is filled with hydrogen at a pressure of 3.5 to 4 bar creating a positive differential!"

The pneumatic test the Siemens Energy Fossil - Field Service performs on the water circuit when drained, uses air, nitrogen or helium (for leak

detection), or a combination of air and helium (for leak detection). This test simulates the operational pressures experienced during service and is an 'over pressure' test to ensure integrity of the system and sealing arrangements.

Then a pressure drop test is performed to check whether the system as a whole meets parameters, and this requires the measurement of test pressure, barometric pressure and ambient temperature.

A vacuum test following the pneumatic test simulates the differential pressure as seen in service. The hydrogen will leak into the water system, normally called a 'gas in coolant' leak.

"With regard to the pressure drop, we aim for a zero leakage rate when corrected for changes in temperature and barometric pressure, although an accepted level is given, which is related to gas loss per day / 24 hr period for operational reasons", Andrew continues.

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The solution and main benefits

The challenge was that the equipment used for the tests was not providing the desired performance.

“We have found that when using analogue pressure and vacuum gauges they are susceptible to being knocked whilst in use affecting the reading displayed. Additionally, the analogue gauges have inherent errors, stiction, and parallax, and operator error. By moving towards a digital read out, these errors will be eliminated”, Andrew explains.

“The resolution accuracy of other products on the market did not meet our requirements over the scale range of the instrument”, Andrew continues.

The Beamex® MC5 Multifunction Calibrators combine the three pressure/vacuum modules and the external barometric module and temperature recording element all in one unit and can be sited away from physical disturbance.

Moreover, the MC5 has a datalogging function so the equipment can be installed for testing and set to capture data at set intervals over the period of the test. The information can be manually recorded and also downloaded to a computer for interpretation. The advantage of the downloaded element is that it can be interpreted via the computer software to determine a point in time when the test fails or is about to fail. Furthermore, with the accuracy requirements, the prediction of a test failure can be highlighted earlier and can be addressed or detected way before an analogue gauge would respond to the failure. This gives us a chance to take action before the end of the test and, if necessary, make repairs and re-start the test.

What made Beamex® MC5 a good choice? “Having all of the test equipment in one device, the ability to log into the data. Siemens Energy Fossil - Field Service has several MC5s that are constantly in use”, Andrew explains. The criteria for choosing Beamex were therefore accuracy, datalogging capability, ease of use and the ability to determine a test failure before the test runs its course.

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Case Story in Brief

Customer profile

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The situation

Siemens Energy Fossil - Field Service in Nottingham oversees the repair, service and upgrade of Siemens gas and steam turbine generators in the UK, including the Parsons steam turbine generators that are still in service across the globe, as well as other non-Siemens manufactured equipment. Specific tasks of the Siemens Energy Fossil - Field Service, are to service and repair hydrogen and water-cooled electrical power generators in the UK and worldwide. As part of the service, and prior to commissioning of the machine following servicing, the Field Service performs pneumatic and vacuum tests on the water-cooling circuit. The challenge was that the equipment used earlier for these tests was not providing the desired performance. The benefits of using the Beamex® MC5 Multifunction Calibrators are improvements in efficiency, the ability of determining test failures early and taking corrective actions. This results in timesavings.

Solution

- Beamex® MC5 Multifunction Calibrator

Main benefits

- High accuracy calibration and measurement equipment that is easy to use and provides datalogging capability.
- All-in-one capability – the Beamex® MC5 replaces several measurement devices.
- Improved efficiency in field-testing.
- Timesavings.

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