

QUALITY ACCEPTANCE TESTS

END OF LIFE TESTING FOR BOILER PERFORMANCE AND CONFORMANCE TO SPECIFICATIONS

Client

Dunkirk Boiler, Division of ECR International, Inc.,
Dunkirk, New York

Problem Scope

Dunkirk required a 100% automatic quality assurance test for the Quantum 90 series of hot water boilers, which would detect failure modes enabling Dunkirk to reduce the number of boilers returned by customers after shipping. These boilers combine high efficiency, innovative technology and simplicity of design. For detailed information on the Q90 boilers, visit the Dunkirk website at www.dunkirk.com.

Technical Highlights

The test system consists of a PC connected to a serial combustion analyzer and National Instruments FieldPoint hardware to collect information about each unit under test. Each test station has two beds and is capable of monitoring two boilers. The test stations are interfaced to the plant-wide information system to ensure that only conforming product will be shipped to the customer.

Before testing begins, a supervisor sets the parameters against which the boiler is tested. A series of screens allows the supervisor to establish system paths and test parameters. This information is held in Excel workbooks that can be accessed directly. Whenever new testing equipment is added, it must be calibrated.

To test a boiler, the operator connects the Q90 test station to the boiler, identifies the boiler to the system, and presses the Fill button on a pendant connected to the FieldPoint hardware to begin the test. The Q90 test station opens the fill and return valves to fill the boiler. Then the test station turns on the boiler and takes a series of measurements to ensure that emissions and temperature are within the specified range for that boiler. While the test is running, the system records data and saves the data to worksheets that can later be viewed. The

test lasts from 3-5 minutes. After the test is run, the boiler power is shut off and drained. At completion, the results of the test and the pass/fail status of the unit are communicated to the plant-wide information system via ODBC.

If the boiler fails, the operator is notified and the boiler will either go to quality hold or be fixed and then retested. When a boiler passes the test successfully, the system generates a label to be placed on the boiler, which is then ready to be sent out.

Results

Dunkirk is now able to measure more parameters than they could previously, which has allowed them to detect all of the standard operational failure modes. As a result, none of the boilers shipped in 2000 have been returned due to performance problems. Additionally, this testing system surpasses the requirement of their customers and complies with ISO 9000 requirements.

Dunkirk was very pleased with the adjustability of the new system. The supervisor has control of the test sequence and test parameters with an Excel workbook. All of the test engineers are familiar with Excel, so it was an easy transition. The new test system has eliminated the need for judgment calls—the computer makes the decision, not the operator. Since the tests are tied to the Synix ERP system, boilers do not leave the building until they pass.

