EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Gas Turbine Overhaul at Iberdrola's Castellon Station

Success Story

Working with Iberdrola's CMDS (Center for Monitoring, Diagnosis and Simulation), EPRI developed a Gas Turbine Overhaul Plan (GTOP) software to fully document a hot section inspection for a 9FA frame combustion turbine. In the past year, CMDS has been charged with carrying out planned and unplanned outages of the utility's combined cycle plants. Together, EPRI and CMDS validated application of GTOP at the utility's Castellon Station power plant. Application of the software involved validating and documenting the hundreds of tasks related to machine disassembly, inspection, reassembly, and start-up. With GTOP, Iberdrola was better able to plan, manage, and document this major overhaul. In addition, use of the software created a foundation for Iberdrola to increasing take direct responsibility for maintaining its own large fleet of advanced gas turbines.

The Challenge

Complete overhauls of large, frame-sized gas turbines represent significant efforts for utilities, typically requiring 10-12 weeks. Scheduling of these overhauls is critical; delays can result in more costly repairs and loss of revenue.

Utilities need state-of-the-art tools to improve overhaul planning and management capabilities, document service/repair histories of internal turbine components, and interface with other maintenance systems such as inventory control. In addition, utilities often accumulate deferrable maintenance activities during operation and schedule them during overhauls. Without proper planning, these added maintenance activities can lead to confusing out-task schedules, completion delays, and cost overruns.

Tools for planning turbine overhauls can assist utilities in conducting their own overhauls and thereby achieving more control over the process and its schedule and potentially lower the cost of the overhaul. Alternatively, if utilities are contracting with OEMs or vendors for overhauls, the tools can help utilities in more effectively negotiating costs and specifying work to be done.

The Solution

EPRI's GTOP is a comprehensive package for planning, managing, and documenting combustion turbine overhauls. The software's planning recommendations and overhaul data were developed through review of overhaul plans, field experience, owners' instruction manual information, and review of reports and papers from numerous sources, including EPRI.

GTOP data files provide the building blocks for users to develop, schedule, track, and record data; generate reports; and estimate costs for a major overhaul. The software's detailed work process breakdown and record-keeping facilitate the effective management of machine inspections and overhauls, whether performed in-house or by contractors. As a result, the software reduces the time required for CT overhauls

by enabling better tracking of tasks, and hence more efficient use of overhaul personnel. In addition, confidence that CT overhaul will be completed on time enables power control personnel to schedule their system generation requirements more effectively.

GTOP can be integrated with other maintenance systems to provide better control over inventory systems, allow for individual parts tracking, and permit maintenance data recorded during an inspection or overhaul to become the driver for subsequent maintenance work. In addition, GTOP is adaptable for application to overhauls or inspections of a lesser scope, such as combustion inspection or hot-gas-path inspection, as well as special projects such as unscheduled maintenance, forced outages, or other unusual activities involving one-time modifications.

In general, GTOP users have reported improved overhaul activity management savings on the order of $300,000 in labor, better maintenance history records, and reassembly quality assurance.

Application

Castellon Station is an 800-MW 9FA combined cycle plant located about 100 miles south of Barcelona, Spain. The plant outage occurred over a three-week period in October 2006 and included the concurrent Combustion Inspection (CI) and Hot Gas Path (HGP) maintenance activities on two GE 9FA combustion turbines. EPRI worked with the Iberdrola CMDS maintenance staff to adapt the 9FA GTOP to plan, manage, and document the results of the concurrent outage.

Benefits

Application of the GTOP software offered Iberdrola a detailed understanding of the gas turbine overhaul complexities. This understanding creates a foundation from which Iberdrola can increasingly take on more direct responsibility for maintaining its own machines. Building its in-house corporate technical competencies related to the maintenance of a large advanced gas turbine fleet is a key strategic element in controlling future O&M expenditures.

Technical Contact

EPRI: Leonard Angello at 650-855-7939 (langello@epri.com)
Iberdrola: Dr. Jose-Antonio Tagle (josea.tagle@iberdrola.es)
Iberdrola: Maria Martin (mmarting@iberdrola.es)
Iberdrola: Antonio Caruana (acaruanar@iberdrola.es)

Contact Information

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com).

1016211 Project ID: 063251 November 2007

Electric Power Research Institute
3420 Hillview Avenue, Palo Alto, California 94304-1338 • PO Box 10412, Palo Alto, California 94303-0813 USA
800.313.3774 • 650.855.2121 • askepri@epri.com • www.epri.com