

# Emerson's Ovation™ Contributes to Additional 8 Megawatts and \$25,000-\$40,000 Annual Savings at GIM's Channelview Cogeneration Plant

## RESULTS

- 8 megawatts of additional power gained from accurate tuning
- \$20,000-\$30,000 annual savings in steam turbine maintenance and service costs
- \$5,000-\$10,000 annual fuel cost savings
- Tighter control and monitoring reduces risk of equipment damage
- Maintained continuous operation during upgrade to meet steam obligations



## APPLICATION

830-MW combined-cycle (4x4x1) cogeneration plant with four 170-MW Siemens-Westinghouse 501F natural gas-fired combustion turbines, four heat recovery steam generators (HRSGs), and one Alstom COMAX steam turbine.

## CUSTOMER

GIM Channelview Cogeneration LLC, Channelview Cogeneration Power Plant located in Channelview, Texas.

## CHALLENGE

The Channelview Cogeneration Power Plant began operations in 2001 to provide wholesale electricity and steam to Equistar Chemical's Channelview complex with surplus energy sold for use by Texas consumers. For years, GIM Channelview had experienced significant functionality issues and high service costs associated with the three Advant 160 controllers originally installed on the Alstom COMAX steam turbine. In 2010, GIM explored options for upgrading the steam turbine controls. Goals for the project included:

- Reduce maintenance and service costs
- Improve steam turbine operation
- Increase operational efficiency.

***“Our confidence in efficient plant operation has increased significantly since installing Ovation for direct control of our steam turbine processes. Now, our technicians are armed with practical tools for in-house maintenance and problem solving, allowing them to make immediate changes to the control logic when needed. Beyond saving us tens of thousands of dollars, this capability will help us optimize plant operations across the board.”***

**Doug Marcontell**  
Maintenance Manager  
Channelview Cogeneration Plant

### SOLUTION

In November 2010, the GIM Channelview plant replaced the Advant system with Emerson's Ovation™ control system. Ovation technology was already controlling balance-of-plant (BOP) equipment and processes at the facility, including the four HRSGs, condensate system, natural gas system and switchyard, as well as interfacing to the four combustion turbines.

Upgrading steam turbine controls to the Ovation system has improved the plant's operational efficiency. Unlike the previous system, the Ovation control scheme uses a temperature and pressure differential bandwidth to ensure that the admission steam valve opens properly in order to release low-pressure steam back to the turbine for improved efficiency. This feature alone saves GIM Channelview \$5,000 – \$10,000 annually in fuel costs.

The new Ovation control philosophy also enables accurate tuning of the initial pressure control loop, high-pressure upstream blade and duct burners. Resulting performance improvements contribute to the plant's ability to generate an additional 8 megawatts of power.

The control modernization also provides GIM Channelview with numerous operational and maintenance savings. For example, the Ovation system provides automated steam turbine startup and shutdown sequencing. Prior to the upgrade, plant personnel had to perform these tasks manually. Ovation's automated startup and shutdown sequencing provides tighter monitoring and control of temperature and speed, thereby greatly reducing the risk of equipment damage.

Furthermore, with the existing proprietary control system, all maintenance, service or other modifications had to be performed by the OEM, which was both costly and time-consuming. In contrast, Ovation technology is designed to allow users to easily perform diagnostics and modify control strategies. Beyond the time and inconvenience of relying on the OEM, GIM Channelview expects to save roughly \$20,000 – \$30,000 each year in steam turbine maintenance and service costs. Consolidating control systems also moves GIM Channelview closer to a common platform across the entire power block, which is advantageous on several fronts: It reduces the inventory of spare parts that must be kept on site. It streamlines operator training and helps optimize personnel deployment. And it enables plant personnel to operate the entire plant on an integrated system without having to leave the central control room.

The Ovation retrofit project also included eliminating the manual calibration of six proportional control valves, renovating the automatic turning gear to engage automatically on coast down, and streamlining the control schemes for easier troubleshooting.

The retrofit was a turnkey project, with Emerson responsible for designing, engineering, manufacturing, testing, training, installing and commissioning the control systems. In all, the integrated Ovation control system now manages more than 3,100 I/O points across the entire plant, and includes nine redundant controllers and nine engineering and operator workstations communicating over a Fast Ethernet network architecture.

Timing was an important consideration for this project. Because steam flow could not be disrupted to Equistar Chemical's Channelview Complex, installation of the new steam turbine controller had to be coordinated with the upgrade of the existing Ovation BOP control system. Emerson was able to perform the entire system upgrade while keeping three of the four gas-fired combustion turbines operational at all times in order to satisfy GIM's contractual obligations for steam production.