

# Emerson's Smart Wireless Network Produces Annual Revenue Increase of \$512,000 for CFE with Extra \$1,375,000 When Fully Implemented

## RESULTS

- Increased productivity and plant coverage by 10%
- Increased annual revenues by \$512,000 US
- Decreased on-site time by 1/3
- Anticipate an additional 40% productivity increase producing an extra \$1,375,000 US annually without adding personnel when all five teams implement Smart Wireless



## APPLICATION

Wireless network to determine thermal efficiencies of 140 power plants located throughout Mexico

## CUSTOMER

Comisión Federal de Electricidad (CFE), Testing Laboratory of Equipment and Materials (LAPEM) located in Mexico

## CHALLENGE

Comisión Federal de Electricidad (CFE) is the Mexican state-owned electric company responsible for control and development of the national electric industry. CFE also operates many of Mexico's power generating facilities. The Testing Laboratory of Equipment and Materials (LAPEM), a technical support group of CFE Generation, evaluates CFE power plants (thermal, hydraulic, nuclear, geothermal, and combined cycle) to determine a plant's thermal behavior by measuring pressures, temperatures, flows, and electrical power. LAPEM performs calculations and performance tests, based on international codes (ASME PTC), to determine a plant's heat rate and equipment efficiency.

LAPEM has five analysis teams that set up temporary measurement facilities at each of 140 power plants. The teams find it difficult to analyze and report on 100 percent of the plants due to the time needed at each site. LAPEM required a solution that would reduce the evaluation turn-around time to enable site visits and analysis at each plant every other year.

***“In the past, we could only cover about 50 plants per year. We needed to reduce turnaround time at each plant in order to reach every plant in a two-year cycle. Emerson's Smart Wireless made it possible for the team equipped with wireless devices to cut their on-site time by one-third, enabling them to complete more services in a year's time and proving the value of wireless.”***

**Oscar Martinez Mejia**  
Comisión Federal de Electricidad  
Testing Laboratory of Equipment and Materials

### SOLUTION

CFE LAPEM successfully employed Emerson Process Management's (Emerson) Smart Wireless technology to help determine thermal efficiencies at power generating units throughout Mexico. In contrast to the traditional method of collecting wired measurements, one LAPEM team was able to easily establish a temporary wireless network in their assigned power plants, thereby making it possible to increase its productivity and plant coverage by 10 percent. This led to an annual revenue increase of \$512,000 US for LAPEM. It has also improved the revenue of the Federal Electrical Commission by pushing higher output for each plant while reducing costs.

The ease of use and the reliable performance of Emerson's Smart Wireless system resulted in a decision by the Laboratory Analysis group to equip all five of its analytical teams with wireless instrumentation. Their productivity is expected to increase by another 40 percent with faster turnaround time between services. As a result, all five teams should perform 25 more assessment services per year, producing an extra \$1,375,000 US annually without adding personnel. Each of the 140 power units can now be visited and analyzed every other year.

When a group of technicians and engineers arrive at a plant, they install 7 to 25 Rosemount® wireless instruments, depending on the size of the unit (350MW, 300MW, 160MW, and smaller), plus a Smart Wireless Gateway to receive key flow, pressure, and temperature measurements which are fed to a thermal efficiency model. The model is used to determine the heat rate of the unit and the efficiency of such equipment as condensers, cooling towers, boilers, turbines, and auxiliary equipment as well as energy losses. This information helps the analytical team define the plant problems that need corrected in order to maximize production efficiency.

Smart Wireless self-organizing networks start functioning as soon as the devices are mounted and the batteries are installed. Each wireless device in a network can act as a router for other nearby devices, passing messages along until they reach their destination. If there is an obstruction, transmissions are simply re-routed along the mesh network until a clear path to the Smart Wireless Gateway is found. As plant conditions change or new obstacles are encountered, such as temporary scaffolding, new equipment, or a parked construction trailer, these wireless networks simply reorganize the barrier and find a way around it.

All of this happens automatically, without any involvement by the user, providing redundant communication paths and better reliability than direct, line-of-sight communications between individual devices and their gateway. This self-organizing technology reduces the effort necessary to set up a reliable wireless network in the dense power plant infrastructure, as demonstrated so effectively by the LAPEM team.

For more information:  
[www.EmersonProcess.com/Smartwireless/](http://www.EmersonProcess.com/Smartwireless/)

***“It takes 15 days to install and commission wired instruments, take the readings, and tear down the setup. Then, another week is needed for reporting and other activities before a team can move on to the next plant. In the future, they will be able to cover 75 plants per year, because the on-site work can be done in just 10 days using wireless devices.”***

**Oscar Martinez Mejia**  
Comisión Federal de Electricidad  
Testing Laboratory of Equipment and Materials



*Rosemount® wireless transmitters are used by CFE to receive key flow, pressure, and temperature measurements which are used to determine unit heat rates and equipment efficiency.*