

# Emerson's Ovation® Technology Controls Largest Fossil Turbines in the World

## RESULTS

- Simplified design reduced mechanical parts by 62%, lessening the likelihood of component failure
- Reduced the number of hydraulic fluid circuits from 7 to 2
- Improved protection of turbine equipment
- Decreased maintenance costs by replacing obsolete and unreliable control panel equipment
- Increased turbine equipment monitoring for quicker troubleshooting

## APPLICATION

Steam turbine control and mechanical system upgrade on a 1300 MW Brown Boveri steam turbine generator.

## CUSTOMER

Indiana Michigan Power, a subsidiary of American Electric Power, Rockport Units 1 & 2 located in Rockport, Indiana.

## CHALLENGE

The mechanical hydraulic control (MHC) and mechanical hydraulic protection (MHP) systems for the Brown Boveri 1300 MW turbines at Rockport Units 1 & 2 were designed in the late 1960s – early 1970s as part of the original turbine contract. Exceptional performance of the MHC and MHP systems continued through the new millennium, but a concern for future support and service for obsolete components led AEP to investigate newer electro hydraulic technology. AEP established four main objectives for this important project:

- Reduce potential unit unavailability due to turbine component failures
- Enhance protection schemes to prevent future turbine damage and automate the protection operation
- Increase equipment monitoring for quicker troubleshooting and fixing of turbine control system problems
- Reduce maintenance costs by eliminating obsolete and problematic turbine auxiliary equipment from the control room panel



***“There was a lot of pressure to make this project work with 1300 MWs of generation on the line. Emerson and AEP put in a great deal of effort to make sure this project was done right. We like the results.”***

**Jerry Lutz**  
AEP Project Team Leader



## SOLUTION

Emerson's Ovation® expert technology and turbine hydraulic equipment design were selected to meet the goals established by AEP for the mechanical hydraulic control and protection system upgrade.

The Rockport project was a collaboration between AEP plant experts and Emerson's turbine specialists. AEP led the team with detailed knowledge of the unique Rockport turbine by providing the needed information to help Emerson customize the design of the electro hydraulic system. The result was a tremendous effort put forth by both companies to provide a solid solution that met AEP objectives.

**Increased Unit Availability** - The simplified design of the Rockport mechanical/hydraulic system significantly decreased the number of mechanical components by 62% and reduced the number of unique hydraulic fluid circuits from 7 to 2. Both of these factors reduce the likelihood of a forced outage due to turbine mechanical component failure, thus increasing unit availability for generation.

**Improved Protection** - Use of Ovation control schemes provided Rockport with improved protection of turbine equipment, better processing of alarms to quickly alert operators of any problems, and easier turbine operation.

**Increased Monitoring** - Incorporation of electronic overspeed protection into the Ovation control system logic provided operators with better supervision of turbine speed protection schemes and eliminated the mechanical overspeed protection system. Additionally, the units' operator interface included built-in trip and speed diagnostics for quicker indication of component failure during a turbine trip. Examples of the diagnostics include trip monitoring with speed at the time of a trip and maximum speed attained following a trip.

**Reduced Maintenance Costs** - Functions performed by problematic auxiliary turbine equipment such as recorders, annunciators, and hand/auto stations for steam seal, lube oil cooling, and turbine drains are integrated into the Ovation system. Overall maintenance costs are reduced because technicians no longer need to spend valuable time troubleshooting within these areas.



Emerson's scope of work for the AEP Rockport project included providing the turbine hydraulic equipment, as shown above.

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