

Con Edison's East River Repowering Project Uses Ovation™ Simulation to Dramatically Reduce Plant Startup Time

RESULTS

- Contributed to reduced startup duration of Con Edison's first truncated combined cycle plant by 3 months
- Educated operators on theory, behavior, and responsiveness of new technology versus traditional boiler/steam turbine configurations
- Trained operators to use appropriate displays to analyze variables for quick response to abnormal scenarios
- Verified and validated new controls and interfaces to third-party systems prior to "live" plant operation



APPLICATION

Simulation of a 360-megawatt new truncated combined cycle plant consisting of 2 GE gas turbines, 2 HRSGs, and 1 steam ring header design.

CUSTOMER

Consolidated Edison Company of New York (Con Edison), East River Repowering Project (ERRP) Station located in Manhattan, East 14th Street, New York.

CHALLENGE

Con Edison's East River energy complex underwent major improvements to maintain reliable and reasonably priced steam supply and electricity for customers throughout New York City. The East River Repowering Project is a newly built truncated combined cycle facility using two General Electric combustion turbines connected to two heat recovery steam generators (HRSGs) and a steam ring header. This unique configuration provides steam at 3 million lb/hr for dispatch into Manhattan, where it is used as a key source for heat in the winter and air conditioning in the summer. Con Edison's significant investment in this plant made safe and timely commissioning and startup of the plant crucial. Located in Manhattan, Con Edison also had to adhere to strict environmental constraints, such as noise levels during construction, as well as emissions levels during commissioning, startup, and operation of the plant. In order to help ensure optimal operation of the ERRP plant, Con Edison sought a means to efficiently train their operators using equipment and plant models duplicating the repowered East River plant prior to actual commissioning and startup. Con Edison also wanted a tool to help them verify and validate new control logic prior to installation into the plant's control system.

“Use of Ovation simulation helped to ensure that Con Edison's investment in ERRP's new plant technology would be optimized by well trained operators and accurate controls. One major benefit was safe and efficient plant startup that reduced the plant's commissioning time from 4 months to 1 month.”

Hsiu-Chen Wang
Senior Engineer
Consolidated Edison of New York
East River Repowering Project

SOLUTION

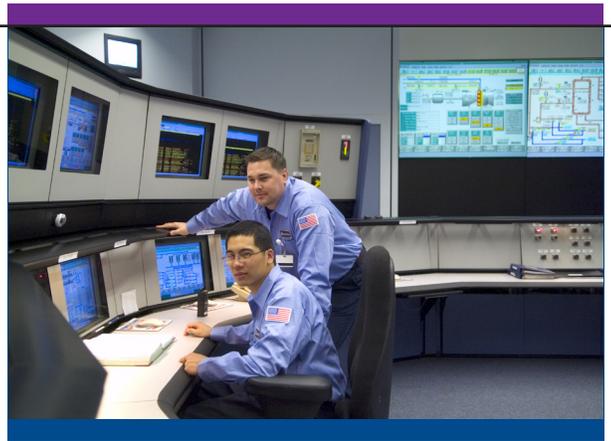
The East River Repowering Project represented a major investment in modern plant equipment to maintain high plant reliability that was essential to consistent performance of Con Edison's Steam Distribution System. Based on a two decade relationship of proven performance, Con Edison partnered with Emerson to provide the right solution. Emerson's Ovation™ technology was selected to monitor and control the unique processes associated with the new technology employed at the ERRP site. In order to ensure optimal plant operation, Con Edison engineers and operators teamed with Emerson to configure a highfidelity Ovation simulator.

ERRP's Ovation simulator consists of actual plant control software and duplicate workstations that mimic the ERRP control room. The Ovation simulator was used extensively to train operators, formerly familiar with traditional boiler/steam turbine plant configurations, on the operation of the new truncated combined cycle plant. Operators also became well versed on using the microprocessor-based system, which provides the ability to quickly recognize and react to abnormal plant process situations, as opposed to the previously installed hard-wired controls. The Ovation simulator was also used to develop optimum operator methodology which is documented in the plant's operating procedures.

Another key simulator benefit was verification and validation of the new control system logic before startup of the plant. During the simulation design phase, ERRP operators and engineers evaluated both steady state and transient conditions based on plant design criteria. Results of these evaluations provided Con Edison engineers with a better understanding and troubleshooting of the process dynamics that led to development of accurate control strategies under normal and abnormal operating conditions.

Con Edison also tested interfaces to an extensive amount of third-party equipment connected to the control system, such as the GE MarkV turbine control system, and PLC networks for the burner management, gas compressor, and water treatment systems. Pre-testing of the data links helped to further reduce the plant's commissioning time.

After a successful plant startup, the Ovation simulator is now used to optimize the ERRP processes for improved efficiency and reliability. Further plant tuning, as well as the addition of any new equipment, can be tested and confirmed on the simulator before integration into the live system.



Con Edison's operators learn how to efficiently operate the ERRP Ovation control system, as shown in the control room photos above and below, by using a customized high-fidelity Ovation simulator.

