Rawhide Energy Station Drives Operational Excellence and Reduces Simulated Startup and Shutdown Time by 44% with Ovation™ Digital Twin Simulation

RESULTS

- Experienced a 44% reduction in simulated startup and shutdown time and related fuel usage
- Completed more than 400 man-hours of simulator training within 4 months
- Provides a safe environment for operators to become adept at handling complex operating scenarios
- Enables control logic testing without risk to actual plant operation

APPLICATION
300-MW baseload unit equipped with a Combustion Engineering subcritical natural draft coal-fired boiler and Westinghouse steam turbine

CUSTOMER
Platte River Power Authority (PRPA), Rawhide Energy Station Unit 1 (Rawhide) located in Wellington, Colorado, U.S.

CHALLENGE
With a 2016 capacity factor of 91.57%, the third-highest for comparably sized U.S. coal plants, Rawhide plant operators had little opportunity to gain much-needed experience in efficiently executing startups and shutdowns and confidently managing upset conditions.

This was complicated by the fact that half of the Rawhide operators had less than a few years of experience and a notable portion of the experienced operators would be retiring in coming years.

Rawhide has relied on Emerson's Ovation™ control system to monitor and control critical processes since November 2015. After installation, the plant needed to commit to a formal training and certification program in order to attain true operational excellence.

This meant purchasing an easily maintainable high-fidelity simulator that could be used by the operations department to train control room and FGD operators and by the engineering staff for control logic testing, patch verification and continuous improvement of plant operating procedures.

> *"Our vision was to use the simulator to drive cultural change, consistency in plant operations and continuous operational improvement.*
>
> *In a short time, we've experienced how the ability to make changes in a controlled virtual environment without worrying about taking the unit offline is invaluable as we continue to drive toward a culture of operational excellence at Rawhide Energy Station."*
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> **Johel Comas**
> Senior Controls Engineer
> Platte River Power Authority
> Rawhide Station

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SOLUTION

In November 2015, PRPA replaced a mix of DCS and PLC systems at Rawhide with a single Ovation platform to monitor and control critical plant processes including air quality (scrubber-FGD), balance-of-plant, boiler, burner management, data acquisition, fuel handling, sootblowing, steam turbine and water treatment.

The contract included Ovation digital twin simulation technology for use by the operations and engineering staffs to:

- Train personnel to manage complex operating scenarios in a safe environment
- Test control logic changes without risk to plant operations
- Verify patches prior to installing them on the plant control system
- Continuously improve plant operating procedures

Emerson's high-fidelity Ovation digital twin simulator is in use now for training, control logic testing, patch verification and continuous improvement of plant operating procedures at Rawhide Energy Station.

Ovation digital twin simulation uses plant models that were built with the same familiar engineering tools as the Ovation control system. This enables the Rawhide staff to maintain the simulator more easily, keeping it current with control logic and other plant changes as well as industry standards.

Several important factors played a key role in the project's success including:

- A close working relationship between PRPA and Emerson team members
- Having a single Emerson project manager to oversee the entire project from start to finish
- Active involvement and ownership from different PRPA operations crews during verification meetings

Since installation, Rawhide's engineering department has used the simulator to increase its efficiency, testing all major logic changes without risk to the actual plant and watching the outcomes as they play out in real-time in the simulated environment. Additionally, security patches are now confidently loaded on the real system after being tested on the simulator, making it easier and less stressful to keep the control system up-to-date. The engineers also use the simulator as a test bed when making global changes to graphic macros and overviews, saving considerable time while eliminating the risk of a unit trip.

PRPA has been pleased with the impact that the new high-fidelity Ovation digital twin simulator has had on its training program. In the first four months, operations completed over 400 man-hours of simulator training and has already seen significant benefits, including a 44% reduction in the time operators require to perform plant startup and shutdown scenarios.

PRPA plans to continue using the simulator to refine operating procedures and further reduce startup and shutdown times. Rawhide operators are now able to experience operating conditions and malfunctions that most of them had not previously seen. The ability to make changes in a controlled virtual environment without worrying about taking the unit off line is invaluable to PRPA as they continue to drive toward a culture of operational excellence at Rawhide Energy Station.

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For more information:
www.Emerson.com/Ovation

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