

# FACT SHEET: Real-Time Engineering

## Issue background

Following the 2011 Southwest outage, industry reports indicated that further use of Advanced Network Applications to run Real-Time Contingency Analysis of the power system would improve system reliability and help prevent similar events in the future. A North American Electric Reliability Corporation Reliability Standard development team was formed and recently completed revised Standard TOP-001-3. In addition to the intent of the standard, there are economic advantages that can also be realized, e.g., reduction of real-time curtailments for both generation and transmission services. Read more to learn about Western's approach to accomplish this new requirement.

## Real-Time Engineering desks

Reliability Standard TOP-001-3 is a mandatory reliability standard for all Transmission Operators

- Approved by FERC Nov. 19, 2015
- Subject to enforcement April 1, 2017
- **Intent:** To prevent instability, uncontrolled separation or cascading outages that adversely impact reliability.
- **What's new:** Requirement to run a real-time assessment at least once every 30 minutes
- **Historical requirements remain:** Perform current day, day ahead and seasonal studies to verify that the anticipated system configuration does not indicate the risk for exceeding System Operating Limits.

## Workload implications

Western's plan to meet the requirements of the Standard is to implement the following (this may not be the only manner to accomplish meeting the requirements):

- Develop and maintain Advanced Network Applications, which involves complex system modeling and processing huge amounts of real-time data.
- Run and monitor the Real-Time Contingency Analysis, which requires engineering or extremely advanced system knowledge to evaluate the validity of the solutions and recommend mitigation. Personnel performing this function require NERC certification because they will direct real-time system operations.

## Necessary staffing

### RM/DSW/CRSP

#### 9 new positions

- One Real-Time Engineering desk to cover the WACM and WALC balancing authorities, five qualified paths and 8,000+ miles of transmission
- Supervisor
  - Three engineers (Loveland)
  - Three engineers (Phoenix)
  - Two SCADA network engineers (one in Loveland, one in Phoenix)

### UGP

#### 6 new positions

- One Real-Time Engineering desk to cover the WAUE and WAUW balancing authorities, customers within their service areas and 8,000+ miles of transmission

### SN

#### 2 new positions

- One operations engineer to support the RTCA and real-time assessment
- One SCADA network engineer to support the RTCA

## Meeting the Standard

The most effective way to accomplish real-time assessments uses an advanced network modeling application that incorporates real-time data and system status—from SCADA—to study potential system operations (protective relay operations, planned outages, etc.) and evaluates whether these operations could cause violation of system operating limits or system instability.

## What will it cost?

The cost of the new full-time equivalents are about \$200,000/position. Throughout Western, the costs are estimated to be:

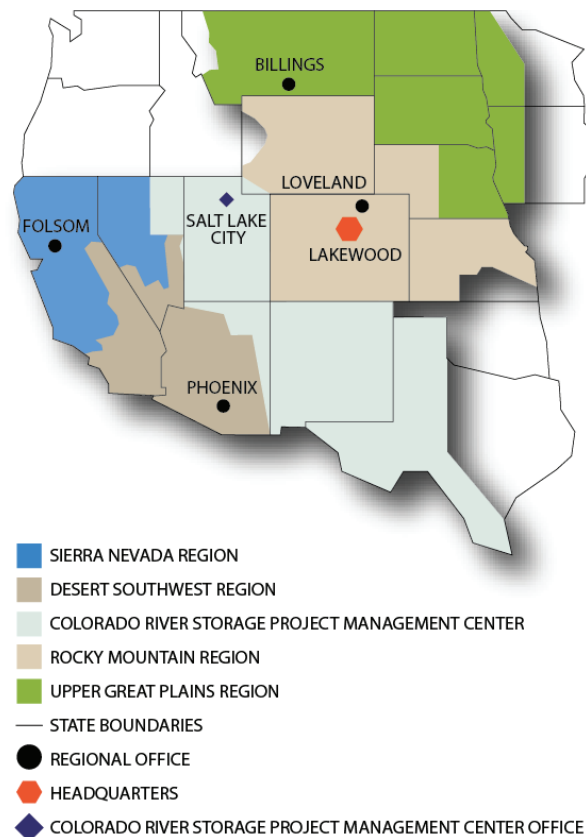
- RM/DSW/CRSP — \$1.8 million
- UGP — \$1.2 million
- SN — \$800,000

## Why are there differences among Western's regions?

RM, DSW, CRSP and UGP have many miles of transmission across large geographic areas, including significant amounts of sub-transmission voltage loads that may not be modeled in the Reliability Coordinator tools. These factors combine to justify 24/7 Real-Time Engineering desks to ensure accurate RTCA results, system reliability and redundancy with the peak RC RTCA.

SN has significantly less transmission miles and is located between two huge BA/TOP areas (Bonneville Power Administration and California Independent System Operator). SN is also a Sub-Balancing Authority within the Balancing Authority of Northern California. The BANC Operator is also a TOP, which will be running an RTCA as well. All of these entities, as well as the RC, will have visibility into SN's system. These factors allow SN to cover the requirements with fewer personnel.

Note: SN is incurring some risk by not having a Real-Time Engineering desk, but is mitigating that risk by working with the BANC Operator to share responsibilities.



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Western Area Power Administration annually markets and transmits more than 25,000 gigawatt hours of clean, renewable power from 56 hydroelectric powerplants owned and operated by the Bureau of Reclamation and the U.S. Army Corps of Engineers in 15 western and central states. It is part of the Department of Energy.

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