

San Juan Basin

Energy Connect

Increasing electric load growth in the San Juan Basin region of Colorado and New Mexico, in residential, commercial and industrial sectors, has put a strain on the existing electrical system.

Tri-State Generation and Transmission Association (Tri-State) is proposing to construct a 230-kilovolt (kV) transmission line from the Farmington area in northwest New Mexico to Ignacio, Colorado. This line and supporting electrical facilities are needed to provide power delivery infrastructure for the San Juan Basin that will relieve transmission constraints, serve new loads and offer economic development through renewable energy opportunities.

What is a transmission constraint?

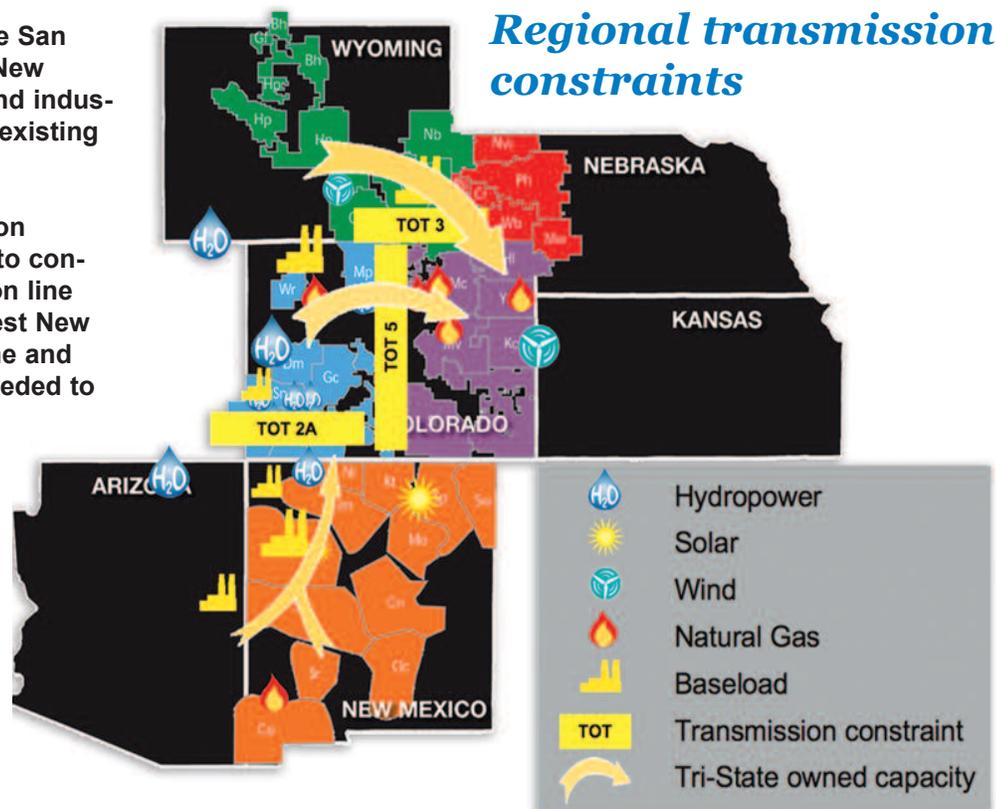
The North American Electric Reliability Corporation (NERC) and the Western Electricity Coordinating Council (WECC) defines a constraint as a limitation on one or more transmission elements that may be reached during contingency, emergency, or normal operating conditions. Generally, these limits occur either when transmission equipment reaches its thermal rating or that voltage levels at substations served from the transmission equipment decline below minimum accepted levels.

How do constraints impact the San Juan Basin?

TOT2A, as well as others such as TOT3 and TOT5, is a constrained transmission path recognized by NERC/WECC. Transmission Operating Standards such as NERC TOP-007-WECC-1 recognize the operating limits defined in the WECC Path Catalog for TOT2A (read back page). This path is limited to a maximum of 690 megawatts of flow to the south from central western Colorado to New Mexico less any load in southwest Colorado. As the load in southwest Colorado increases, the amount of transmission capacity available to transmit power between western Colorado and New Mexico decreases.

The proposed San Juan Basin project would remove part of the load served from the existing lines that comprise TOT2A. Tri-State as well as the other transmission owners of TOT2A adhere to NERC/WECC standards. Tri-State could be fined if the operating limits for TOT2A are violated.

Regional transmission constraints



What is NERC?

The North American Electric Reliability Corporation (NERC) works to ensure the reliability of the bulk power system in North America. To achieve that, it develops and enforces reliability standards; assesses reliability annually via 10-year and seasonal forecasts; monitors the bulk power system; and educates, trains, and certifies industry personnel. NERC is a self-regulatory organization, subject to oversight by the U.S. Federal Energy Regulatory Commission and governmental authorities in Canada.

What is WECC?

The Western Electricity Coordinating Council (WECC) is the regional entity responsible for coordinating and promoting bulk electric system reliability in the Western Interconnection. In addition, WECC assures open and non-discriminatory transmission access among members, provides a forum for resolving transmission access disputes, and provides an environment for coordinating the operating and planning activities of its members as set forth in the WECC bylaws. WECC is geographically the largest and most diverse of the eight regional entities that have delegation agreements with NERC.

WECC Path Catalog #31. TOT 2A

Revised November 2007

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|--|--|-------------|--------------------|--------------------------|----------|---------------------------|-----------|-----------------------------|----------|
| Location: | Extreme Southwest Colorado | | | | | | | | |
| Definition: | Sum of the flows on the following transmission lines: <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;"><u>Line</u></td> <td style="text-align: center;"><u>Metered End</u></td> </tr> <tr> <td>Hesperus-San Juan 345-kV</td> <td>San Juan</td> </tr> <tr> <td>Hesperus-Glade Tap 115-kV</td> <td>Glade Tap</td> </tr> <tr> <td>Lost Canyon-Shiprock 230-kV</td> <td>Shiprock</td> </tr> </table> | <u>Line</u> | <u>Metered End</u> | Hesperus-San Juan 345-kV | San Juan | Hesperus-Glade Tap 115-kV | Glade Tap | Lost Canyon-Shiprock 230-kV | Shiprock |
| <u>Line</u> | <u>Metered End</u> | | | | | | | | |
| Hesperus-San Juan 345-kV | San Juan | | | | | | | | |
| Hesperus-Glade Tap 115-kV | Glade Tap | | | | | | | | |
| Lost Canyon-Shiprock 230-kV | Shiprock | | | | | | | | |
| Transfer Limit: | <p><u>North to South:</u> 690 MW minus net load in the Montrose-Curecanti-San Juan-Shiprock area of southwest Colorado. The load itself ranges 110-220 MW, and internal thermal generation can be 100 MW and hydro generation can be 15 MW. However, the maximum rating is 690 MW.</p> <p><u>South to North:</u> Not defined</p> <p>Depending on local load and generation levels, the real-time rating ranges between a maximum of 690 MW and a minimum of 550 MW. Typically, the real-time rating centers around 650 MW.</p> | | | | | | | | |
| Critical Disturbance that limits the transfer capability: | The critical disturbance is the outage of the 345-kV system between Montrose and San Juan. The limiting elements are low voltages or emergency overloads on the local 115-kV system, or emergency overloads on local 230/115-kV or 345/115-kV transformers. The specific outage and limiting element depend on load levels and generation patterns. | | | | | | | | |
| When: | The rating was established jointly by Colorado-Ute Electric Association (CUEA) and Western Area Power Administration (WAPA)-Montrose, in 1989. | | | | | | | | |
| System Conditions: | This rating is independent of transfer levels between major areas of WECC although the actual flow is heavily impacted by inadvertent flow. The transfer limit is impacted by local area generation and load levels. Historically, the flows have been predominately north to south across the path, although flows south to north have been recently experienced. | | | | | | | | |
| Study Criteria: | <p>(Summary)</p> <p><u>System intact:</u></p> <ul style="list-style-type: none"> • Per unit (p.u.) voltages between 0.95 p.u. and 1.05 p.u. • All lines and transformers loaded to less than continuous rating. <p><u>Single contingency outage conditions:</u></p> <ul style="list-style-type: none"> • Per unit voltages between 0.90 p.u. and 1.10 p.u. • All lines loaded to less than 15-minute emergency ratings. • All transformers loaded to less than 30-minute emergency ratings. • Transient voltage swings down to 0.7 p.u. permitted. | | | | | | | | |



For more information:

San Juan Basin Energy Connect

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