PUC Project No. 46304

Oversight Relating to the Southern Cross Transmission (SCT) DC Tie

Congestion Management Considerations (Directive 7)

Date: 12/16/2019

Market stakeholder input: CMWG 05/06/2019 , 07/03/2019, 09/30/2019; WMS 06/25/19

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| **Directive # 7 –Congestion Management** | **ERCOT shall (a) study and determine whether some or all DC ties should be economically dispatched or whether implementing a congestion-management plan or special protection scheme would more reliably and cost-effectively manage congestion caused by DC tie flows, (b) implement any necessary revisions to its protocols, guides, standards, and systems as appropriate, and (c) certify to the Commission when it has completed these actions.** |

***Determination:***

***(a) ERCOT has determined that DC Ties cannot be economically dispatched using the existing DC Tie scheduling interface and that developing the appropriate systems to enable economic dispatch between ERCOT and one or more other systems would be prohibitively complicated and expensive. ERCOT’s consideration of any Constraint Management Plan (CMP) or Remedial Action Scheme (RAS) is fact-specific, and ERCOT will evaluate CMP or RAS developed by ERCOT or properly proposed by other entities at the appropriate time. Based on information currently available to ERCOT, ERCOT expects that it would have reliability concerns with a CMP or RAS solution to address potential congestion impacted by the Southern Cross DC Tie due to its size;***

***(b) ERCOT has not identified any required revisions to ERCOT Protocols or Guides as a result of this Directive.***

Reasons for determination:

*Determination of whether some or all DC Ties should be economically dispatched*

Although integrating DC Ties into ERCOT’s security-constrained economic dispatch (SCED) engine would allow for more efficient scheduling of imports and exports over the DC Ties, ERCOT has determined that this is ultimately not feasible.

Imports and exports over the DC Ties connecting ERCOT with the Southwest Power Pool (SPP) and Mexico are currently scheduled over an electronic interface operated by Open Access Technology International, Inc. (OATI) in accordance with design specifications and standards established by the North American Energy Standards Board (NAESB). This interface requires the use of “electronic tags,” or “e-Tags,” each of which proposes a specified import or export quantity on a given DC Tie for a specified Operating Hour and is subject to approval or rejection (or curtailment) by each affected Balancing Authority and other entities. E-Tags may be submitted as far out as days in advance of the Operating Hour, or as close as minutes before the Operating Hour.

The use of static, pre-determined e-Tags for scheduling DC Tie flows is incompatible with economic dispatch of the DC Ties, which presumably would determine the appropriate direction and magnitude of DC Tie flows every five minutes (or other established interval) based on offers and bids for the injection or withdrawal of energy at both ends of the DC Tie and subject to constraints in each of the impacted systems, whereas the current e-Tag submission and approval process determines flows without regard to price based on submissions that may occur well in advance of the Operating Hour.

The OATI interface for submitting e-Tags could conceivably be modified to allow the ERCOT DC Ties to be dynamically scheduled, as is the case for several other regional interties in North America. Dynamic scheduling allows the actual flow value to vary in real time from the scheduled value and also allows for the ex-post reconciliation of the actual flow value with the scheduled flow value. However, dynamic scheduling does not equate to economic dispatch; a separate economic dispatch system would need to be created and implemented independent of the electronic e-Tag submission interface.

For several reasons, ERCOT is not inclined to pursue the development of systems to economically dispatch the DC Ties between ERCOT and other control areas. Such an effort would require ERCOT to coordinate the development of a joint dispatch mechanism with the affected system operator(s) at the other end of each affected DC Tie. This would be a highly complicated undertaking, as the mechanism would have to be integrated with the dispatch software in each affected region. Such a mechanism would almost certainly require ERCOT and each other affected system operator to enter into a binding commitment to use the dispatch mechanism and to accept the output in system dispatch, which would limit ERCOT’s authority over one aspect of its market design. And the enforcement of this commitment may not be subject to the sole jurisdiction of the Public Utility Commission of Texas, unlike all other matters of ERCOT market design. Developing these systems would also presumably require ERCOT to incur substantial cost because of the impact on the core systems controlling economic dispatch, and at least in the case of the existing DC Ties, would require consumers to fund this cost without a clear corresponding public benefit. For these reasons, ERCOT has determined that incorporating DC Ties into SCED is not presently feasible.

*Determination of whether implementing a Congestion Management Plan (CMP) or Remedial Action Scheme (RAS)[[1]](#footnote-2) could reliably and cost-effectively manage congestion caused by DC Tie flows*

As more fully described in Section 11 of the Nodal Operating Guide, Constraint Management Plans (CMP) (formerly known as “Congestion Management Plans”) and Remedial Action Schemes (RAS) (formerly known as “Special Protection Systems”)—are devices or schemes that ERCOT, in its discretion, may employ when it anticipates that SCED alone may not be able to ensure secure operation of the transmission system under certain specific circumstances, or where operation under N-1-secure conditions may not allow for full utilization of the ERCOT transmission system.

In some cases, imports and exports over DC Ties can impact congestion or stability conditions on the ERCOT System. In those instances, it is conceivable that ERCOT could devise or approve a CMP or RAS that would allow for use of the DC Tie above the level at which it would be constrained under normal N-1 operations. However, such a CMP or RAS introduces reliability risk. A RAS, for example, depends on the reliable operation of a set of automatic actions that are designed to eliminate an overload or other security violation in the event of a contingency. If that scheme does not work as planned due to some mechanical failure or other issue, transmission facilities could be damaged and may need to be taken out of service for extended periods of time, and ERCOT operators could be forced to take emergency actions, including shedding load, in an effort to avoid a wider system problem.

Thus, while a CMP or RAS might enable greater transfers over the DC Ties under certain conditions in which the import or export flow would otherwise be constrained, ERCOT would also be required to consider the potential reliability impacts of such a proposal.  Based on information currently available to ERCOT, ERCOT expects that it would have reliability concerns with a CMP or RAS solution to address potential congestion impacted by the Southern Cross DC Tie due to its size. ERCOT’s evaluation of a proposed CMP or RAS is necessarily fact-specific; it depends on the specific set of actions proposed, the system topology impacted, and the reliability risks attendant to the proposal, among other things. For this reason, ERCOT cannot categorically approve or reject a CMP or RAS at this time; ERCOT must evaluate any properly proposed CMP or RAS in light of the relevant facts and circumstances and in accordance with the ERCOT rules and policies in effect at the time of consideration.

*Other means of addressing congestion on DC Ties*

While ERCOT has concluded that economic dispatch of DC Ties is not feasible, and while ERCOT has not identified any particular CMP or RAS that should be approved to address DC Tie flows, this does not mean that no mechanism exists to manage congestion due to flows over the DC Ties. QSEs scheduling imports or exports will be impacted by prices determined by SCED, and when an import or export contributes to congestion on a binding transmission constraint, the SCED-determined price will be negatively impacted. These price signals provide a strong incentive to each affected QSE to adjust its e-Tags to mitigate the congestion. At the same time, SCED will adjust its dispatch of Generation Resources to mitigate this congestion.

To the extent the QSE does not take timely actions in response to price, or to the extent SCED does not have sufficient on-line, dispatchable generation to alleviate the congestion caused in part by the DC Tie import or export, ERCOT can use Reliability Unit Commitment (RUC) to bring any available dispatchable generation on line to alleviate the congestion. If RUC is not (or would not be) sufficient to resolve the issue, and no approved CMP is available to resolve the issue, ERCOT can issue a DC Tie Curtailment Notice and curtail the import or export of the DC Tie to the extent necessary to operate the system within its limits.

1. The Directive uses the term “Special Protection Scheme” but the equivalent current term is “Remedial Action Scheme.” [↑](#footnote-ref-2)