Date: July 9, 2013  
To: ERCOT Board of Directors  
From: Kenan Ögelman, Technical Advisory Committee (TAC) Chair  
Subject: Methodology for Setting the Shadow Price Caps and Power Balance Penalties in Security Constrained Economic Dispatch

**Issue for the ERCOT Board of Directors**

**ERCOT Board of Directors (ERCOT Board) Meeting Date:** July 16, 2013  
**Agenda Item No.:** 7.2

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<th><strong>Issue:</strong> Protocol 6.5.7.1.11, Transmission Network and Power Balance Constraint Management, requires that ERCOT determine the methodology for setting maximum Shadow Prices for network constraints and for the power balance constraint and that after TAC recommendation, the ERCOT Board approves the final methodology.</th>
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**Background/History:**

**Procedural History:**

On February 28, 2013, AEP Service Corporation filed proposed revisions to the Methodology for Setting Maximum Shadow Prices for Network and Power Balance Constraints. Paragraph (4) of Nodal Protocol 6.5.7.1.11, Transmission Network and Power Balance Constraint Management, states that:

> ERCOT shall determine the methodology for setting maximum Shadow Prices for network constraints and for the power balance constraint. Following review and recommendation by TAC, the ERCOT Board shall review the recommendation and approve a final methodology.

On March 7, 2013, TAC unanimously tabled consideration of the proposed revisions and requested the Wholesale Market Subcommittee (WMS) make a recommendation at the May 2, 2013 TAC meeting. At the April 12, 2013 WMS meeting, a motion to endorse the February 28th AEP proposal failed via roll call vote with nine objections from the Independent Generator (4), Independent Power Marketer (IPM) (2), Independent Retail Electric Provider (IREP) (2) and Investor Owned Utility (IOU) Market Segments, and eight abstentions from the Consumer (3), Cooperative, IPM (2), IOU, and Municipal Market Segments.

On May 2, 2013, TAC voted via roll call to recommended approval of the proposed revisions to methodology for setting maximum Shadow Prices as recommended by AEP and as revised by Luminant and requested ERCOT to return with an Impact Analysis to the June TAC. There were two opposing votes from the Independent Generator and IPM Market Segments and ten abstentions from the Independent Generator (3), IPM (3), IREP (3) and IOU Market Segments.

On June 3, 2013, ERCOT distributed an Impact Analysis to TAC documenting the following:

- **Cost:** Between $65k and $85k
- Estimated Project Duration: 5 – 7 months
- Impacts: ERCOT systems impacted - Market Management System and Information Systems Management; ERCOT will also update its business processes. The extent of the staffing impact depends upon how often the trigger conditions are met. Given historical trends for meeting the trigger condition, ERCOT is not requesting additional staff to support the revision. However, if the trigger conditions are met more frequently, there could be FTE impacts to planning and operations.

On June 6, 2013, TAC voted to recommend approval of the methodology as revised by TAC; to recommend a priority of 2013 and rank of 885; and to recommend an effective date of upon Board approval for the language that does not require system implementation. There was one opposing vote from the Generator Market Segment and four abstentions from the IOU and IPM (3) Market Segments.

TAC Recommendation Summary:
Currently, ERCOT is to modify the Shadow Price Cap for a transmission network constraint that is consistently irresolvable by Security Constrained Economic Dispatch (SCED) if either of the following two conditions are true:

A. A constraint violation is not resolved by SCED or overridden for more than two consecutive hours on more than four consecutive Operating Days; or
B. A constraint violation is not resolved by SCED for more than a total of 20 hours in a rolling 30 day period.

The TAC recommendation:
- Adds a third condition that results in the adjustment of a Shadow Price Cap for a constraint. If a constraint has the same overloaded Transmission Element and Direction as a constraint that has met condition A or B above, its Shadow Price Cap will also be adjusted. This will happen once the net margin of the triggering constraint reaches the $95,000/MW threshold described in the methodology.
- Defines the Shadow Price Cap for such a constraint will be set to the same value as the constraint that met either trigger condition A or B.
- Indicates the Shadow Price Cap will remain in effect for the shorter of:
  - The remainder of the calendar year; or
  - The remainder of the month in which the constraint is determined to be resolvable by SCED.
- Provides a sequence of review steps for ERCOT once a constraint meets the trigger conditions and accumulates a net margin that exceeds $95,000/MW (i.e., review and recall of transmission outages contributing to constraint if feasible, development of Remedial Action Plans, Temporary Outage Action Plans, Special Protection Systems if feasible)

The revised ERCOT Business Practice, Setting the Shadow Price Caps and Power Balance Penalties in Security Constrained Economic Dispatch, to reflect the TAC recommendation to the Board is included as Attachment A.
The Impact Analysis related to the proposed revisions to the methodology is included as Attachment B.

**Key Factors Influencing Issue:**
TAC reviewed the recommendations before them and voted to recommend to the ERCOT Board the approval of the ERCOT methodology as described herein.

**Conclusion/Recommendation:**
As more specifically described above, TAC respectfully recommends that the ERCOT Board revise the ERCOT Business Practice, Setting the Shadow Price Caps and Power Balance Penalties in Security Constrained Economic Dispatch, as described in Attachment A and assign a priority of 2013 and rank of 885 to the related system changes.
ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.
BOARD OF DIRECTORS RESOLUTION

WHEREAS, paragraph (4) of Protocol Section 6.5.7.1.11, Transmission Network and Power Balance Constraint Management, requires the Electric Reliability Council of Texas, Inc. (ERCOT) Board of Directors (Board) approval of a final methodology for setting maximum Shadow Prices for network constraints; and

WHEREAS, the ERCOT Board deems it desirable and in ERCOT’s best interest to approve the revised ERCOT Business Practice, Setting the Shadow Price Caps and Power Balance Penalties in Security Constrained Economic Dispatch, as described in Attachment A.

THEREFORE be it RESOLVED, that the ERCOT Board hereby approves the revised ERCOT Business Practice, Setting the Shadow Price Caps and Power Balance Penalties in Security Constrained Economic Dispatch, as described in Attachment A.

CORPORATE SECRETARY’S CERTIFICATE

I, Vickie G. Leady, Assistant Corporate Secretary of ERCOT, do hereby certify that, at its July 16, 2013 meeting, the ERCOT Board passed a motion approving the above Resolution by ______.

IN WITNESS WHEREOF, I have hereunto set my hand this ____ day of July, 2013.

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Vickie G. Leady
Assistant Corporate Secretary