MEMO

Date: May 10, 2005
To: Board of Directors
From: Read Comstock, TAC Chair
Subject: Methodology for Reserve Margin Calculation

Issue for the ERCOT Board of Directors

ERCOT Board of Director Meeting Date: May 17, 2005
Agenda Item No.: 11b

Issue:
Consideration of recommendation on the methodology for calculating the reserve margin to make the calculation more representative of the actual margin.

Key Factors Influencing Issue:
The current generation reserve margin requirement for the ERCOT Region is 12.5%, as approved by the ERCOT Board on August 20, 2002. At the February 3, 2005, ERCOT Technical Advisory Committee (TAC) meeting, the TAC created a joint Reliability and Operating Subcommittee (ROS) and Wholesale Market Subcommittee (WMS) task force, referred to as the Generation Adequacy Task Force (GATF) to address issues surrounding the methodology for calculating the 12.5% ERCOT reserve margin (e.g., treatment of "mothballed" generating units). Concerns raised by ERCOT Market Participants and the PUCT about the impact of recent announcements of possible generating unit retirements on the ERCOT reserve margin for the summer peak load season of 2005 provided the catalyst for the creation of the task force. Specifically, TAC charged the GATF to "reexamine the reserve margin calculation and make recommendations on how to make calculations more representative of the actual situation." This review was not to reexamine the 12.5% reserve margin level, but rather how to calculate various factors in measuring available reserves.

The GATF met seven times during the months of February through April reviewing each of the following factors in the existing ERCOT reserve margin calculation:

1. Load Forecast
2. Installed Capacity
3. Load Participation
4. Wind Generating Capacity
5. "Mothballed" Capacity
6. DC Tie Capacity
7. "Switchable" Capacity
8. Retired Capacity

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After thorough review of issues and addressing data availability, the GATF was able to come to a consensus agreement on all of the above factors except DC Tie Capacity. The TAC approved the GATF recommendations and recommends the use of 50% of the maximum ERCOT DC Tie import capability (428 MW).

The following is a brief summary of current methodology for calculating the reserve margin compared to the TAC and GATF recommended changes to the ERCOT reserve margin calculation:

1. **Load Forecast – The current reserve margin calculation methodology** uses a load forecast that is based on a simplistic trending of historic ERCOT peak demand growth to develop the long-term forecast of summer peak demand, unadjusted for weather or economic conditions. ***The recommended methodology*** and new ERCOT load forecast will be based on an econometric model of the ERCOT service area which is currently under development by ERCOT. The methodology will develop regression equations that describe the historic hourly load of the ERCOT System, by season, as a function of certain economic and temperature variables. The forecasted economic variables (obtained from an economic forecasting service) and temperature profile are used in the regression equations to forecast hourly ERCOT System loads for the forecast period, from which the annual peak demand and energy is obtained.
2. **Installed Capacity – The current methodology** uses the capacity for a Generation Resource that was submitted by the Resource owner in its registration of the Resource with ERCOT. The registered capacity must be available prior to June 1st to be included in the calculation for the year. The registered capacity may or may not reflect the capability of the Resource during the summer peak load period. ***The recommended methodology*** will use Summer Net Dependable Generating Capability based on ERCOT testing criteria.
3. **Load Participation – The current methodology** includes 1,150 MW of Loads Acting as Resources (LaaRs) in the calculation of the reserve margin. ***The recommended methodology*** will include the amount of Loads Acting as Resources (LaaRs), Balancing Up Loads (BULs) and loads providing other Ancillary Services (e.g., Responsive Reserves, Non-Spin and Replacement). For 2005, this amount will be the LaaR amount procured by ERCOT (i.e., 1,150 MW). For future forecasts, the

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amount will be based on the average of historical amount of Loads offered into these markets during peak load hours.

4. **Wind Generating Capacity – The current methodology** discounts the installed capacity of wind turbine Resources by 90% (effectively using 10%) because it was anticipated that wind production during the summer peak load hours would likely be very low, based on the limited meteorological data available when the methodology was developed. Since that time, operating data has become available showing that using 10% of wind capacity does not reflect historical production. ***The recommended methodology*** will include a percentage of installed wind generating capacity based on actual historical wind production during the summer peak load hours (i.e., weekdays in July and August for the hours 16:00 through 18:00). For 2005, this percentage is 2.9% based on historical data for the years 2002-2004.
5. **"Mothballed" Capacity –** Mothballed Units are generating units that the owner has reported to ERCOT as suspended from operation, but the owner has not announced retirement of the unit, and for which ERCOT has declined to execute a Reliability Must Run (RMR) Agreement. **The current methodology** removes 100% of the Mothballed Units from the calculation for the first year of the forecast period, and assumes that 100% of the Mothballed Units will be available for the subsequent years of the forecast (years 2-5). ***The recommended methodology*** will include "mothballed" capacity based on the lead time and probability information furnished by the Resource owners as a result of the implementation of PRRs 573,Mothballed Generation Resource, and 596 ,Mothballed Generation Estimated Return to Service Dates (under consideration by the Board this month). ERCOT has begun requesting the information required by PRR 596 from Resource owners that have Mothballed Units.
6. **Direct Current Tie Capacity – The current methodology** includes 100% of the nameplate capacity (currently 856 MW) of the Direct Current Ties (DC Ties). The rationale is an assumption that in times of reduced generating reserves within ERCOT, the resulting higher prices for power in ERCOT would cause entities outside of ERCOT to sell their power into ERCOT over the DC Ties. This may not be true if the entities have contract restrictions on the other side of the DC Tie, prices are higher on the other side of the tie or there isn't an available transmission path. ***The recommended methodology*** will include 50% of the maximum ERCOT DC Tie import capability (428 MW)
7. **"Switchable" Capacity** – Switchable Units are generating units that can

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provide energy to either the ERCOT Transmission Grid or a grid outside the ERCOT Region **The current methodology** includes 100% of the capacity of switchable units. This is based on the same rationale as the current treatment for the DC Ties. ***The recommended methodology*** will include the Summer Net Dependable Capability of switchable units less the amount of capacity reported by the owners of switchable units to be unavailable to ERCOT during the summer peak load period as the result of a requirement, such as a unit-specific contract, for delivery outside of ERCOT. The report would be based on the implementation of PRR 591, Switchable Unit Declaration (under consideration by the Board this month).

8. **Retired Capacity – The current methodology** excludes all generating units that have been designated "retired" by the Resource owner (either through the RMR Application or by written notification to ERCOT) ***The recommended methodology does not change this treatment of planned unit retirements.***

There is one issue still under consideration by the ERCOT stakeholders:

Netting of Generation and Load – Most of the generation and load that is netted is on private networks. **The current methodology** includes information in either the Firm Load Forecast (net load) or the installed capacity (net generation). However, information on generation and load that is netted is not always available to ERCOT. Reporting of seasonal net generation or load information, as required by PRR 593, Reporting of Net Generation and Load, should provide sufficient information to determine the net generation or load available to ERCOT. **For the recommended reserve margin calculation methodology**, ERCOT staff will make appropriate adjustment to the ERCOT load forecast and/or the net dependable summer generating capabilities based on the responses received if the PRR is approved. PRR 593 is on the agenda for discussion at the May PRS meeting. The suggested change to the methodology on this issue, if approved, would not take effect until the 2006 reserve margin calculation.

There is uncertainty associated with a number of the inputs to the ERCOT reserve margin calculation (e.g., load forecast, market price impacts on capacity available from DC Ties, Switchable Units and Mothballed Units, etc.). The recommendations consider these uncertainties to the extent possible in a formulaic approach while attempting to produce an equation to calculate an ERCOT reserve margin forecast that produces a reasonable estimate of such reserve margins while not being overly cumbersome or complex. It is not possible to create an equation that can capture all of the subtle and not-so-subtle impacts of market

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prices on capacity reserves. However, the TAC and the GATF believe that the recommendations represent an improvement in the existing ERCOT reserve margin calculation.
Alternatives: (1) Approve the TAC recommendation on the reserve margin calculation as recommended by TAC or as modified by the Board: (2) reject the TAC recommendation; or (3) remand the reserve margin methodology to TAC with instructions.
Conclusion/Recommendation: As more specifically described above, TAC and ERCOT Staff recommend the Board approve the TAC recommended methodology for the reserve margin calculation.