



**MINUTES OF THE BOARD OF DIRECTORS MEETING OF  
ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.**

**Electric Reliability Council of Texas, Inc. Offices**

**Austin, Texas**

**10:00 a.m.**

**October 19, 2004**

Pursuant to notice duly given, the Meeting of the Board of Directors of Electric Reliability Council of Texas, Inc. convened at approximately 10:15 a.m. on October 19, 2004.

**Meeting Attendance:**

**Board Members:**

Armentrout, Mark		Unaffiliated; Proxy to M. Espinosa after 3:30 p.m.
Espinosa, Miguel		Unaffiliated
Greene, Mike	TXU Power	IOU; Board Chairman
Hayslip, Darrell	Calpine Corp.	Independent Generator; Segment Alternate, John Meyer after 3:30 p.m.
Hudson, Paul	Public Utility Commission of Texas	PUCT Chairman
Kahn, Bob	Austin Energy	Municipal
Karnei, Clifton	Brazos Electric Power Cooperative	Cooperative
Manning, Bob	H-E-B Grocery Company	Consumer/Commercial – Board Vice Chairman
McClellan, Suzi	Office of Public Utility Counsel	OPUC Residential & Small Commercial Consumers; Proxy to K. Ogelman after 1:15 p.m.
Payton, Tom	Occidental Chemical Corp.	Consumer/Industrial; Proxy to K. Ogelman after 2:15 p.m.
Priestly, Vanus	Constellation New Energy, Inc.	Segment Alternative, Independent REP
Schrader, Tom	ERCOT President and CEO	ERCOT
Stockstill, Dottie	Mirant Americas Energy Marketing	Independent Power Marketer

**Staff and Guests:**

Barbara Clemenhausen	Sempra Energy
Barry Huddleston	Dynegy
Barry Smith	AEP
Barry Smitherman	PUCT Commissioner
Ben Jack	CenterPoint Energy
Betty Day	ERCOT Staff
Bill Bojorquez	ERCOT Staff
Bob Peck	LCRA
Brad Belk	LCRA
Brittney Albracht	ERCOT Staff
Cesar Seymour	Tractebel
Charles McElhenie	Clearing Group



Cheryl Moseley	ERCOT Staff
Cheryl Yeager	ERCOT Staff
Chris Hughes	Exelon
Clayton Greer	Constellation Power Source
David Kasper	ERCOT Staff
David McMillan	Green Mountain Energy
Diana Zake	ERCOT Staff
Dottie Roark	ERCOT Staff
Erin Bain	PUCT
Evan Rowe	PUCT
Garry Waters	Competitive Assets
Gary Stroud	ERCOT Staff
Greg Ramon	TECO/Frontera
Jeyant Tamby	ERCOT Staff
Jim Galvin	ERCOT Staff
Jim Harder	City of Garland
John Adams	ERCOT Staff
John Flory	TECC
John Houston	CenterPoint
John Meyer	Reliant
John Moore	
Julie Parsley	PUCT Commissioner
Kay Trostle	TXI
Kevin Gresham	Reliant, PRS Chairman
Kristy Ashley	Exelon
Larry Grimm	ERCOT Staff
Margaret Pemberton	ERCOT Vice President, General Counsel and Secretary
Mark Dreyfus	Austin Energy
Mark Walker	ERCOT Staff
Maxine Buckles	ERCOT Vice President and Chief Financial Officer
Michael Sparks	Tractebel
Mike Petterson	ERCOT Staff
Ned Ross	FPL Energy
Neil Eddleman	TEAM
Parviz Adib	PUCT Staff
Paul Lassink	AEP
Paula Mueller	PUCT
Phillip Oldham	FHR/TIEC
Randy Chapman	Texas Legal Services Center
Randy Jones	Calpine
Ray Giuliani	ERCOT Vice President and Chief of Market Operations
Read Comstock	Strategic Energy, TAC Chairman
Richard Gruber	ERCOT Staff
Rob Connell	ERCOT Staff
Sam Jones	ERCOT Executive Vice President and Chief Operations Officer
Sean Berry	PricewaterhouseCoopers
Steve Bartley	CPS
Terri Eaton	Green Mountain Energy
Tom Standish	CenterPoint



Trip Doggett	TNT Independent Facilitator
Walt Shumate	Shumate & Associates
Wendell Bell	TPPA

### Announcements

Chairman Greene called the meeting to order and determined that a quorum was present and mentioned the proxies set forth above. Chairman Greene also welcomed Public Utility Commission of Texas (PUCT) Commissioners Julie Parsley and Barry Smitherman to the meeting.

At this time, Paul Hudson, Chairman of the PUCT, announced the beginning of the PUCT Open Meeting scheduled for today.

### Approval of Minutes

Chairman Greene requested comments on and approval of the minutes of the September 2004 Board of Directors meeting. **Bob Manning moved to approve the minutes as circulated. Clifton Karnei seconded the motion. The motion passed by a unanimous voice vote with no abstentions.**

### CEO Report

Chairman Greene invited Thomas F. Schrader, President and Chief Executive Officer, to report on the Reliability Council's activities. Mr. Schrader reported that several concerns were raised regarding ERCOT at the recent hearing before the Electric Utility Restructuring Legislative Oversight Committee. Concerns from the Committee members fall into three categories: management practices and controls, public accountability and use of resources. Mr. Schrader reported that ERCOT management is addressing these issues. In regards to management practices, Mr. Schrader stated that third-party audits are underway to evaluate ERCOT's procedures, processes and compliance. Even before receiving those results, the Reliability Council has implemented enhancements to its policies and procedures regarding contracting, competitive bidding, hiring, cyber-security, training and internal audit. On public accountability, Mr. Schrader stated that the Reliability Council is: (i) working more closely with the PUCT, (ii) trying to communicate more proactively and (iii) ensuring an open process for Board activities. Addressing efficient use of resources, the Reliability Council has developed a draft budget that freezes the System Administration Fee ("Admin Fee") and reduces the Reliability Council's debt. Additionally, the Reliability Council will: (i) begin tracking time and expenses to cost categories and objectives, and (ii) reduce its use of contractors.

Next, Mr. Schrader reviewed the Reliability Council's development status and the current challenges it faces as an organization. The company has progressed from a start-up organization (where getting things accomplished was priority) and is in a transition phase, moving towards an on-going, operating organization (where mature business processes must be in place). Mr. Schrader also stated that management has an agenda for the organization that includes: (i) clear goals and objectives; (ii) clear responsibility; (iii) measures of performance; (iv) process improvement; and (v) recognition and rewards.

Ms. Stockstill remarked positively regarding management's assessment efforts to ensure that it has the proper resources in the correct areas.

Mr. Schrader invited Rob Connell, Director of IT Projects, to review the status of recent Projects. Mr. Connell reported that, in the third-quarter, twelve projects were completed (with fifty-nine projects



complete year-to-date), thirty projects remain in progress and thirty-two projects are in planning. Mr. Connell also reported on: (i) the status of projects with respect to timeliness, budget and deliverables, and (ii) the largest projects currently under consideration or in progress.

### **Operations Update**

Chairman Greene invited Sam Jones, Executive Vice-President and Chief Operating Officer, to report on the Reliability Council's operations. Mr. Jones reported on the following matters:

#### **(1) AEP Construction of Power Lines**

At the last meeting, a question arose regarding the timelines of these projects. Since that time, the Reliability Council has discussed these matters with AEP representatives, who will make a presentation to Reliability Council staff today. Because the AEP representative would not be in town until the afternoon, this item was postponed to later on the agenda.

#### **(2) Approval of Ancillary Services Methodology**

Each year, the Board must approve the Ancillary Services procurement methodology. Board members should have received a document in this month's Board packet describing the methodology (attached to these minutes). **Mr. Espinosa moved to approve the Ancillary Service procurement methodology as described in the Board packet and attached hereto. Mr. Payton seconded the motion. The motion passed by unanimous voice vote with no abstentions.**

Chairman Greene asked Mr. Jones if the recent unseasonably high temperatures have created any reliability concerns. Mr. Jones replied that ERCOT has not encountered any reliability issues associated with the temperatures.

Finally, Mr. Jones reported that, as part of the investigation of last year's black-out in the Northeast, NERC has recommended closer review of the reliability regions' operations and activities. NERC has proposed certain guidelines for oversight. One recommendation was to separate compliance monitoring from operations. Mr. Jones stated that ERCOT is in full compliance with the recommendations in the NERC report.

### **Financial Report**

Maxine Buckles, Vice-President and Chief Financial Officer, reported on the Reliability Council's financial matters through September 30, 2004. Revenue (approximately \$99 million) has been somewhat less than the budget forecast as a result of lower than expected energy usage due to mild weather this year. Operating expenses (approximately \$83 million) and capital expenses (approximately \$28 million) have also been lower than budget. Ms. Buckles reported that the Reliability Council's employee headcount is up to 439, while 530 employees were budgeted for the year. Ms. Buckles stated that the Reliability Council has completed fifty-nine capital projects this year.

### **2005 Budget**

Ms. Buckles, Mr. Karnei, Chairman of the Finance & Audit Committee ("F&A Committee"), and Mr. Schrader presented a draft of the 2005 budget. Mr. Karnei stated that headcount is the issue receiving the most discussion during the budget process. Mr. Karnei also reported that, at this time, the F&A



Committee recommends: (i) no increase or decrease in the Admin Fee in 2005, (ii) a capital project budget of \$35 million and (iii) funding those projects 60% (\$21M) through debt and 40% (\$14M) through revenue.

Commissioner Parsley asked how much additional debt the Reliability Council would incur in 2005. Mr. Karnei responded that it would add \$21 million in additional debt in 2005, but that it would pay down some debt, yielding a net decrease in outstanding debt of \$5 million.

Mr. Schrader stated that the budget process began with an assumption that the Admin Fee would not increase in 2005. The Reliability Council must pay an additional \$13 million in debt principle for past debt commitments, which alone equates to more than four cents of the Admin Fee. Management faced significant challenges in reaching the goal of not increasing the Admin Fee (including inflation, market changes, implementing PRRs, *etc.*). Mr. Schrader reported that the management team continues to actively assess staffing needs.

A lengthy discussion took place regarding current staffing levels, future staffing needs, employee benefits and other employee-related matters. Chairman Hudson stated that he expects to see clear documentation for the need of new employee positions, including identifying where contractors are eliminated by a new employee and an evaluation of potential use of existing employees for new activities. Commissioner Parsley suggested the budget materials show a breakdown of what existing and new employees will be doing. Mr. Smitherman suggested that ERCOT management should provide more explanation in the budget materials to describe the assumptions made regarding debt projections (such as the ratio between fixed and floating rates). Mr. Schrader said that there was much work to do to address the concerns raised and to develop the detail needed for the final budget prior to the November Board meeting. Mr. Espinosa noted that compared to last year's process, ERCOT had provided much more detail in the draft budget materials.

Ms. Buckles then presented a detailed analysis of revenues and expenses associated with the 2005 budget. Members of the Board asked many questions regarding the financial information contained in Ms. Buckles' report.

### **Operations Update (continued)**

At this time, Chairman Greene re-invited Sam Jones, ERCOT COO, to the podium to discuss issues surrounding the construction of new transmission lines.

#### **(1) AEP Construction of Power Lines**

Mr. Jones invited Richard Verrett of AEP to report on the status of AEP's transmission line construction. Mr. Verrett began by reviewing the project associated with the Fort Phantom plant. He stated that AEP has had difficulty obtaining some series reactors for that project, but hopes to have the reactors by January or February of 2005.

Next, Mr. Verrett discussed the project related to the LaPalma plant. He stated that the original schedule was to have the project completed by December 2005. Currently, AEP intends to have the line in place to allow the RMR Agreement to terminate in December 2005, as planned.

The last project Mr. Verrett discussed related to the Barney Davis plant. The project involves work at four sub-stations. AEP originally planned to finish the project in December 2004. As of right



now, they believe they will finish the project in May 2005.

### **Finance and Audit Committee Report**

Mr. Karnei, Chairman of the F&A Committee, reported on the following matters:

#### **(1) Foreign Guarantee Agreement**

Mr. Karnei stated that the F&A Committee recommends passing the resolution (attached) approving the use of Guarantee Agreements and their form. **Mr. Karnei moved to approve the Resolution; Mr. Manning seconded the motion. The motion passed by unanimous voice vote with no abstentions.**

#### **(2) Short Payment Issues**

The F&A Committee reviewed two issues related to late payments under the Protocols. One issue is the treatment of late payments under the Protocols and how they relate to payment plans to repay prior short payments. The other issue relates to an entity's failure to make the full payment due under a bankruptcy court-approved reorganization plan. By memorandum in the Board materials, ERCOT Staff informed the Board of Directors that Staff intended to: (i) uplift to QSEs representing LSEs the approximate \$444,000.00 not paid by TCE which was due on October 1, 2004; and (ii) cease accruing interest on TCE's outstanding pre-petition obligation and adjust account entries to correct the accrual of interest since March 2003.

The F&A Committee recommended referring these issues to the Technical Advisory Committee (TAC) for further consideration for how to handle these issues in the future. Chairman Greene agreed with the Committee's recommendation and has asked the TAC Chairman to consider these issues.

#### **(3) Audits**

PricewaterhouseCoopers (PwC) is in the process of concluding their SAS70 audit and recommended several changes to procedures. The Reliability Council has implemented those changes. Mr. Schrader stated that the Reliability Council will conduct a meeting in an open forum to allow questions to PwC representatives regarding the audit. Mr. Priestly stated that the issues raised by PwC had been resolved by September 1, 2004.

Mr. Karnei stated that the Reliability Council has received only one additional EthicsPoint report since last month's meeting. Investigation continues on that matter.

#### **(4) Debt Level**

Mr. Armentrout asked that the F&A Committee develop a strategy for the amount of debt the Reliability Council incurs. Mr. Karnei stated that the F&A Committee would commit to doing so.

### **TAC Report**

Chairman Greene invited Mr. Read Comstock, TAC Chairman, to report on recent TAC activities. Mr. Comstock began his report by stating that Lan Conn of Entergy was elected RMS Vice-Chair for the remainder of this year.





Additionally, Mr. Comstock reported that TAC approved a Retail Market Guide revision (RMGR 2004-012), involving TDSF dispute spreadsheet revisions and also approved three Operating Guide revisions: OGRR150, OGRR151 and OGRR152. TAC approved OGRR150 and OGRR152 unanimously and OGRR151 by a vote of twenty-five to one.

TAC also approved the Commercial Operations Subcommittee Procedures document for the Commercial Operations Subcommittee (COPs). The voting structure would work the same as voting in the Protocols Revision Subcommittee (PRS). The new COPs procedures will become effective January 1, 2005 and the participants will continue to meet as a working group through the remainder of 2004.

### **(1) Protocol Revision Requests**

The PRS met, discussed the issues and submitted Recommendation Reports to TAC regarding the PRRs described below. TAC considered the issues and voted to take action on the PRRs as described below.

TAC approved the following PRRs and recommends their final approval to the Board:

- ***PRR523—Revisions to Protocol Section 21. Proposed effective date: November 1, 2004. No budgetary impact; some effort by ERCOT staff to revise and update internal procedures and documents; no impacts to ERCOT computer systems; allows time for ERCOT to more thoroughly analyze impacts of proposed PRRs and System Change Requests (SCRs); no impact to grid operations.*** This PRR modifies the process for revising the Protocols, including: establishing timelines for ERCOT to complete Impact Analyses for all PRRs submitted, standardizing certain provisions, correcting grammatical errors and formalizing the process for submitting and approving SCRs. PRS unanimously approved recommendation of the PRR as revised by Austin Energy, ERCOT, CenterPoint, TXU and PRS. With all segments present, TAC voted unanimously to recommend approval of PRR523 as recommended by PRS. ERCOT Credit staff and the CWG have reviewed PRR523 and do not believe it requires changes to credit monitoring activity or the calculation of liability.

At this time, Mr. Comstock discussed the more detailed Impact Analysis that will take place under this proposed Protocol revision.

- ***PRR526—OOMC Verifiable Cost Documentation. Proposed effective date: November 1, 2004. No budgetary impact; no impacts to ERCOT computer systems; no significant impacts to ERCOT business functions; no impact to grid operations.*** This PRR inserts new Section 6.8.2.2(4)(b)(iv) defining the documentation standards required when ERCOT cancels or delays a generation unit's planned and approved Maintenance Outage via an OOMC instruction with insufficient time to avoid additional costs. PRS unanimously recommended approval of PRR526 as revised by ERCOT comments. With all segments present, TAC voted unanimously to recommend approval of PRR526 as recommended by PRS. ERCOT Credit staff and the CWG have reviewed PRR526 and do not believe it requires changes to credit monitoring activity or the calculation of liability.
- ***PRR531—Load Clarification. Proposed effective date: November 1, 2004. No budgetary impact; no impact to ERCOT staffing; no significant impacts to ERCOT computer systems; no impacts to ERCOT business functions; no impact to grid operations.*** This PRR makes modifications necessary to clarify the registration and treatment of Loads associated with Block Load Transfers. This PRR clarifies that BLT Load points of delivery are wholesale Loads not



subject to Texas retail choice and should be treated similar to NOIE Loads. PRS unanimously recommended approval of PRR531 as revised by PRS. With all segments present, TAC voted unanimously to recommend approval of PRR531 as recommended by PRS. ERCOT Credit staff and the CWG have reviewed PRR531 and do not believe it requires changes to credit monitoring activity or the calculation of liability.

- **PRR532—Implementation of Non-Transmission Alternatives to RMR. Proposed effective date: November 1, 2004.** Impact to staffing resources is dependant on the number and type of MRA agreements negotiated; impacts to ERCOT systems will be evaluated on a per-contract basis; some impact to Legal, System Planning and Resources Planning functions; impacts to grid operations will be evaluated on a per-contract basis. This PRR revises the Protocols to allow ERCOT to implement non-transmission alternatives to Reliability Must-Run (“RMR”) Services to reduce costs. PRS rejected a request for urgent status for PRR532 through an email vote. PRS voted to recommend approval of PRR532 with two opposing votes and four abstentions. The ERCOT CWG has reviewed PRR532 and determined that implementation of this PRR does not impact the current methods used to calculate ERCOT Creditworthiness Requirements or the kind of activity that should be monitored. However, implementation of PRR532 does have broader credit implications. See CWG Comments dated 9/28/04 for further detail. With all segments present, TAC unanimously approved urgent status for PRR532 to modify the PRR. With one member from the IOU segment opposing and all segments present, TAC voted to recommend approval of PRR532 as revised by CWG comments and TAC.
- **PRR535—Reactive Testing. Proposed effective date: November 1, 2004.** No budgetary impact; no impact to ERCOT staffing; no impacts to ERCOT computer systems; no impacts to ERCOT business functions; no impact to grid operations. This PRR provides that it is the Resource’s capability to provide reactive power that is being tested rather than its capacity, more clearly specifying that reactive testing will take place at a minimum of every two years and specifying the MW level at which a Resource is to be tested. PRS unanimously approved recommendation of the PRR as amended by PRS. With all segments present, TAC voted unanimously to recommend approval of PRR535 as recommended by PRS. ERCOT Credit staff and the CWG reviewed PRR535 and do not believe that it requires changes to credit monitoring activity or the calculation of liability.

Margaret Pemberton, ERCOT General Counsel, recommended a proposed revision to PRR532, changing the wording of PRR532 in a manner set forth for the Board members. A lengthy discussion took place regarding concerns and possible solutions for those concerns, including comments by Mr. Greg Ramon, a representative of TECO/Frontera, Mr. John Meyer of Reliant Energy, Barbara Clemenhagen of Sempra, Mr. Phillip Oldham, representing TIEC and Commissioner Parsley.

**Mr. Manning moved to remand PRR532 to the TAC for further consideration; Mr. Armentrout seconded the motion.** At that time, additional discussion took place. **The motion passed by a vote of nine to three (Messrs. Hayslip and Priestly and Ms. Stockstill opposed) with no abstentions.**

After discussion regarding the remaining PRRs, **Mr. Karnei moved to approve all the remaining PRRs as submitted (PRRs 523, 526, 531 and 535). Mr. Kahn seconded the motion.** At that time, additional discussion took place regarding PRR523. **The motion passed by unanimous voice vote with no abstentions.**





All PRRs and supporting materials appear on the following ERCOT web page:

<http://www.ercot.com/AboutERCOT/PublicDisclosure/ProtocolRev.htm>

(2) **Administration Fee Allocation**

Mr. Comstock reported on TAC's recent meeting regarding this issue. At the meeting, the Reliability Council's staff presented its attempt to allocate costs to the four main elements of Senate Bill 7. Afterward, discussion took place regarding the data presented. The participants in the meeting agreed that the allocation did not contain sufficient detail because the Reliability Council does not have procedures in place to track how each expense relates to Senate Bill 7.

**Texas Nodal Team (TNT) Report**

Chairman Greene invited Trip Doggett, the Independent Facilitator for the Texas Nodal project, to present the TNT Report.

- Mr. Doggett reported on: (i) the cost/benefit study, (ii) TNT Protocols development, (iii) the economists' workshop (held September 16 and 17) and (iv) October 5<sup>th</sup> votes.

A discussion took place regarding several of the issues associated with the TNT's work.

At that time, Richard Gruber, ERCOT Director of Market Services, made a progress report regarding the work of the TNT, TAC, WMS, a market participant established vendor evaluation team and ERCOT Staff on the Board directed implementation of an Auction Day-Ahead Market, or ADAM..

Additional discussion took place, including comments by Parviz Adib of the PUCT, John Meyer of Reliant, and Clayton Greer of Constellation Power Source. The Board requested that Mr. Gruber return in November for another report regarding the available options evaluated, including cost estimates for each option.

**Human Resources & Governance Committee Report**

Mr. Kahn, Chairman of the H.R. & Governance Committee, reported that the committee met this morning and Mr. Gruber reported on the recent survey of Market Participants.

(1) **Approval of Annual Meeting Location**

The annual meeting will take place on December 14, 2004. **Mr. Kahn moved to hold the annual meeting at the Airport Hilton in Austin, Texas. Mr. Karnei seconded the motion. The motion passed by unanimous voice vote with no abstentions.**

**Other Business**

**Membership Notice**

Ms. Pemberton mentioned announced the Record Date for this year's elections. Specifically she noted that, in order to participate in elections, members must be registered and dues paid by November



12, 2004. Ms. Pemberton also stated that the Nominating Committee will soon meet to consider candidates for the vacated Board seat for an Unaffiliated Director.

### **Adjournment**

Chairman Greene adjourned the open portion of the meeting at approximately 4:15 p.m. Chairman Hudson also adjourned the PUCT Open Meeting at that time.

### **Executive Session**

The Board met in Executive Session to discuss litigation matters, H.R. issues and an update from the Special Committee.

**The next Board meeting will take place on November 16, 2004 at the Reliability Council's Metro Center office in Austin, Texas. The following meeting will be held on December 14, 2004 at the Austin Airport Hilton in Austin, Texas.**

Board materials and presentations from the meeting are available on ERCOT's website at:  
<http://www.ercot.com/calendar/2004calendar/2004boardmaterials.htm>

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Margaret Uhlig Pemberton, Corporate Secretary



**Attachment – Resolution**

**RESOLUTION OF  
THE BOARD OF DIRECTORS OF  
ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.**

October 19, 2004

WHEREAS, the Board of Directors (“Board”) of Electric Reliability Council of Texas, Inc., a Texas non-profit corporation (“Company”) deems it desirable and in the best interests of the Company to approve a standard Guarantee Agreement for use by qualified U.S. guarantors and a standard Guarantee Agreement for use by qualified foreign Guarantors;

NOW, THEREFORE, BE IT RESOLVED, that the attached ERCOT Guarantee Agreement, which is attached hereto as Exhibit A is hereby authorized and approved in each and every respect to be accepted by ERCOT for guarantees of QSEs by qualified U.S. companies; and

RESOLVED, that the attached ERCOT Foreign Guarantee Agreement, which is attached hereto as Exhibit B is hereby authorized and approved in each and every respect to be accepted by ERCOT for guarantees of QSEs by qualified foreign companies; and

RESOLVED, that the Proposal for Utilization of the Foreign Guarantee in the ERCOT Market is hereby modified to require that any foreign guarantor maintain a registered Texas Agent, but that a foreign guarantor is not required to maintain a registered New York Agent.



**EXHIBIT A**  
**TO RESOLUTION REGARDING GUARANTEE AGREEMENTS**

**GUARANTEE AGREEMENT**

THIS GUARANTEE (this “*Guarantee*”) is made by the undersigned entity (“*Guarantor*”) in favor of the ELECTRIC COUNCIL OF TEXAS, INC. (“*ERCOT*”) in consideration of ERCOT’s entering into a Standard Form Qualified Scheduling Entity Agreement (the “*QSE Agreement*”) with the Qualified Scheduling Entity identified on the signature page hereof (“*QSE*”). Guarantor is the beneficial owner of a direct or indirect interest in QSE and will directly benefit from the extension of credit to QSE under the QSE Agreement.

In consideration of credit heretofore or hereafter granted by ERCOT to QSE pursuant to the QSE Agreement, Guarantor hereby unconditionally, absolutely and irrevocably guarantees to ERCOT the due and punctual payment of all amounts which QSE may now or in the future owe ERCOT under the QSE Agreement, including, but not limited to, of usage charges, grid management charges, grid operations charge, ancillary services fees, congestion management fees and wheeling charges pursuant to the ERCOT Protocols as defined in the QSE Agreement (collectively, the “*Obligations*”). Notwithstanding the foregoing, the maximum amount for which Guarantor shall be liable hereunder shall not exceed \$\_\_\_\_\_, plus Expenses (as defined below); provided, however, that Guarantor acknowledges and agrees that if QSE’s required creditworthiness limit exceeds such amount at any time, and if ERCOT provides notice to QSE and Guarantor of such fact, ERCOT may require that, if the QSE Agreement is to continue, the amount of Obligations guaranteed hereby be increased to an amount required by the QSE Agreement and the ERCOT Protocols. Guarantor is liable for the full payment and performance of the Obligations, subject to the immediately preceding sentence, as a primary obligor. This is a continuing guarantee for payment and not of collection.

If QSE defaults in the punctual payment of any of the Obligations, Guarantor shall, immediately on demand and without presentment, protest, notice of protest, notice of nonpayment, notice of intent to accelerate, notice of acceleration or any other notice whatsoever (all of which are expressly waived), pay the amount due thereon (subject to the foregoing limitation) to ERCOT.

The obligations of Guarantor hereunder are absolute and unconditional irrespective of (i) the invalidity or unenforceability of the QSE Agreement, (ii) the bankruptcy or insolvency of QSE, (iii) any claim for setoff or any defense which QSE could assert on the Obligations, including, without limitation, force majeure, breach of warranty, and fraud, (iv) any substitution, release or exchange of any other guaranty of or security for any of the Obligations, (v) the existence or terms of any other agreements between Guarantor and any party, including the QSE, and (vi) to the fullest extent permitted by applicable law, irrespective of any other circumstances whatsoever that might otherwise constitute a legal or equitable discharge or defense of a guarantor, it being the intent of this Guarantee that the obligations of Guarantor hereunder shall be absolute and unconditional under any and all circumstances.

It is not necessary for ERCOT, in order to enforce Guarantor’s payment hereunder, first to proceed against QSE or resort to any collateral, security or other guarantors or obligors, if any, or pursue any other remedy. Any collateral, security or obligations of any other guarantors or obligors, if any, may be sold, released, surrendered, exchanged, settled, compromised, waived, subordinated or modified, in each case without consideration and on any terms or conditions, without notice to or further assent from Guarantor. Guarantor’s liability is several and independent of any other guarantees in effect with respect to any part of the Obligations and may be enforced regardless of the existence of any other guarantees.



Notwithstanding any other provision in this Guarantee, this Guarantee shall continue in effect or shall be reinstated if at any time payment, or any part thereof, by QSE to ERCOT with respect to any of the Obligations is rescinded, or must otherwise be repaid by ERCOT as a result of bankruptcy or reorganization of QSE.

No payment by Guarantor shall entitle Guarantor, by subrogation or otherwise, to any right against QSE, including any payment by QSE or out of property of QSE, except after the full payment and discharge of all of the Obligations. All remedies, rights, powers and privileges granted to ERCOT pursuant to this Guarantee are cumulative. The exercise of any or all such rights by ERCOT shall not reduce, limit, impair, discharge, terminate, or otherwise affect the liability of Guarantor. No failure or delay by the ERCOT in exercising any remedy, right, power or privilege pursuant to this Guarantee shall operate as a waiver, and any such remedy, right, power or privilege may be exercised by ERCOT at any time. No partial exercise of any such rights shall preclude further exercise or the exercise of any other remedy, right, power or privilege. No notice or demand by ERCOT upon Guarantor or any other guarantor of the Obligations shall preclude ERCOT from taking further action without notice or demand.

Guarantor hereby expressly waives any and all rights to which it may be entitled by virtue of the laws of the State of Texas governing surety ship and guaranties, including, without limitation, any rights under Rule 31, Texas Rules of Civil Procedure, Chapter 51 of the Texas Property Code, Section 17.001 of the Texas Civil Practice and Remedies Code and Chapter 34 of the Texas Business and Commerce Code, as any or all of the same may be amended or construed from time to time, or the common law of the State of Texas at all relevant times.

The term of this Guarantee shall be for a period of one (1) year, commencing on the date set forth below. Notwithstanding the foregoing, this Guarantee may be terminated by Guarantor at any time by a written notification of termination given by Guarantor to ERCOT at the address shown below. Such termination shall be effective thirty (30) days after the receipt by ERCOT of such notification of termination. Guarantor acknowledges that this Guarantee applies to all Obligations arising prior to the effective date of the termination of this Guarantee, whether by notification of termination, or by expiration of the term.

Guarantor agrees to pay to ERCOT, upon demand, all costs and expenses, including attorneys' fees that may be incurred by ERCOT in attempting to cause satisfaction of Guarantor's liability under this Guarantee ("**Expenses**").

For purposes of giving any notices hereunder, the addresses, telephone numbers, and facsimile numbers of the parties are set forth on the signature page of this Guarantee.

This Guarantee shall bind the heirs, personal representatives, successors and assigns of Guarantor and shall inure to the benefit of ERCOT, its successors and assigns.

No modification of this Guarantee or waiver shall be valid unless in writing and signed by ERCOT and than only to the extent specifically set forth in such writing.

This Guarantee shall be governed by, and constructed in accordance with, the laws of the State of Texas, without regard to any rule or provision on conflict of laws.

QSE: \_\_\_\_\_  
[Name of QSE]



a \_\_\_\_\_  
[Type of entity/jurisdiction of organization]

Date of QSE Agreement: \_\_\_\_\_, 200\_\_.

EXECUTED by GUARANTOR this \_\_\_ day of \_\_\_\_\_, 200\_\_:

\_\_\_\_\_  
[Name of Guarantor] Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

a \_\_\_\_\_  
[Type of entity/jurisdiction of organization] Telephone: \_\_\_\_\_

Facsimile: \_\_\_\_\_

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

ACCEPTED by ERCOT this \_\_\_ day of \_\_\_\_\_, 200\_\_

ELECTRIC RELIABILITY COUNCIL  
OF TEXAS, INC.

Address: 7620 Metro Center Drive  
Austin, Texas 78744  
[For notice and payment]

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

Telephone: 512.225.7070  
Facsimile: 512.225.7079





**EXHIBIT B**  
**TO RESOLUTION REGARDING GUARANTEE AGREEMENTS**

**ERCOT FOREIGN GUARANTEE AGREEMENT**

THIS GUARANTEE (this “*Guarantee*”) is made by the undersigned entity (“*Guarantor*”) in favor of the ELECTRIC COUNCIL OF TEXAS, INC. (“*ERCOT*”) in consideration of ERCOT’s entering into a Standard Form Qualified Scheduling Entity Agreement (the “*QSE Agreement*”) with the Qualified Scheduling Entity identified on the signature page hereof (“*QSE*”). Guarantor is the beneficial owner of a direct or indirect interest in QSE and will directly benefit from the extension of credit to QSE under the QSE Agreement.

In consideration of credit heretofore or hereafter granted by ERCOT to QSE pursuant to the QSE Agreement, Guarantor hereby unconditionally, absolutely and irrevocably guarantees to ERCOT the due and punctual payment of all amounts which QSE may now or in the future owe ERCOT under the QSE Agreement, including, but not limited to, of usage charges, grid management charges, grid operations charge, ancillary services fees, congestion management fees and wheeling charges pursuant to the ERCOT Protocols as defined in the QSE Agreement (collectively, the “*Obligations*”). Notwithstanding the foregoing, the maximum amount for which Guarantor shall be liable hereunder shall not exceed \$\_\_\_\_\_, plus Expenses (as defined below); provided, however, that Guarantor acknowledges and agrees that if QSE’s required creditworthiness limit exceeds such amount at any time, and if ERCOT provides notice to QSE and Guarantor of such fact, ERCOT may require that, if the QSE Agreement is to continue, the amount of Obligations guaranteed hereby be increased to an amount required by the QSE Agreement and the ERCOT Protocols. Guarantor is liable for the full payment and performance of the Obligations, subject to the immediately preceding sentence, as a primary obligor. This is a continuing guarantee for payment and not of collection.

If QSE defaults in the punctual payment of any of the Obligations, Guarantor shall, immediately on demand and without presentment, protest, notice of protest, notice of nonpayment, notice of intent to accelerate, notice of acceleration or any other notice whatsoever (all of which are expressly waived), pay the amount due thereon (subject to the foregoing limitation) to ERCOT.

The obligations of Guarantor hereunder are absolute and unconditional irrespective of (i) the invalidity or unenforceability of the QSE Agreement, (ii) the bankruptcy or insolvency of QSE, (iii) any claim for setoff or any defense which QSE could assert on the Obligations, including, without limitation, force majeure, breach of warranty, and fraud, (iv) any substitution, release or exchange of any other guaranty of or security for any of the Obligations, (v) the existence or terms of any other agreements between Guarantor and any party, including the QSE, and (vi) to the fullest extent permitted by applicable law, irrespective of any other circumstances whatsoever that might otherwise constitute a legal or equitable discharge or defense of a guarantor, it being the intent of this Guarantee that the obligations of Guarantor hereunder shall be absolute and unconditional under any and all circumstances.

It is not necessary for ERCOT, in order to enforce Guarantor’s payment hereunder, first to proceed against QSE or resort to any collateral, security or other guarantors or obligors, if any, or pursue any other remedy. Any collateral, security or obligations of any other guarantors or obligors, if any, may be sold, released, surrendered, exchanged, settled, compromised, waived, subordinated or modified, in each case without consideration and on any terms or conditions, without notice to or further assent from Guarantor. Guarantor’s liability is several and independent of any other guarantees in effect with respect to any part of the Obligations and may be enforced regardless of the existence of any other guarantees.

Notwithstanding any other provision in this Guarantee, this Guarantee shall continue in effect or shall be reinstated if at any time payment, or any part thereof, by QSE to ERCOT with respect to any of the Obligations is rescinded, or must otherwise be repaid by ERCOT as a result of bankruptcy or reorganization of QSE.

No payment by Guarantor shall entitle Guarantor, by subrogation or otherwise, to any right against QSE, including any payment by QSE or out of property of QSE, except after the full payment and discharge of all of the Obligations. All remedies, rights, powers and privileges granted to ERCOT pursuant to this Guarantee are cumulative. The exercise of any or all such rights by ERCOT shall not reduce, limit, impair, discharge, terminate, or otherwise affect the liability of Guarantor. No failure or delay by the ERCOT in exercising any remedy, right, power or privilege pursuant to this Guarantee shall operate as a waiver, and any such remedy, right, power or privilege may be exercised by ERCOT at any time. No partial exercise of any such rights shall preclude further exercise or the exercise of any other remedy, right, power or privilege. No notice or demand by ERCOT upon Guarantor or any other guarantor of the Obligations shall preclude ERCOT from taking further action without notice or demand.

Guarantor hereby expressly waives any and all rights to which it may be entitled by virtue of the laws of the State of Texas governing surety ship and guaranties, including, without limitation, any rights under Rule 31, Texas Rules of Civil Procedure, Chapter 51 of the Texas Property Code, Section 17.001 of the Texas Civil Practice and Remedies Code and Chapter 34 of the Texas Business and Commerce Code, as any or all of the same may be amended or construed from time to time, or the common law of the State of Texas at all relevant times.

The term of this Guarantee shall be for a period of one (1) year, commencing on the date set forth below. Notwithstanding the foregoing, this Guarantee may be terminated by Guarantor at any time by a written notification of termination given by Guarantor to ERCOT at the address shown below. Such termination shall be effective thirty (30) days after the receipt by ERCOT of such notification of termination. Guarantor acknowledges that this Guarantee applies to all Obligations arising prior to the effective date of the termination of this Guarantee, whether by notification of termination, or by expiration of the term.

Guarantor agrees to pay to ERCOT, upon demand, all costs and expenses, including attorneys' fees that may be incurred by ERCOT in attempting to cause satisfaction of Guarantor's liability under this Guarantee ("**Expenses**").

For purposes of giving any notices hereunder, the addresses, telephone numbers, and facsimile numbers of the parties are set forth on the signature page of this Guarantee.

This Guarantee shall bind the heirs, personal representatives, successors and assigns of Guarantor and shall inure to the benefit of ERCOT, its successors and assigns.

No modification of this Guarantee or waiver shall be valid unless in writing and signed by ERCOT and than only to the extent specifically set forth in such writing.

All references in this Guarantee to sums denominated in dollars or with the symbol "\$" refer to the lawful currency of the United States of America. If, for the purposes of obtaining or enforcing judgment against Guarantor in any court in any jurisdiction in connection with this Guarantee, it becomes necessary to convert into any other currency (such other currency being referred to as the "**Judgment Currency**") an amount due in any currency (the "**Obligation Currency**") other than the Judgment Currency under this Guarantee, the conversion shall be made at the rate of exchange prevailing on the business day immediately preceding the date of actual payment of the amount due, in the case of any proceeding in the courts of the State of Texas or in

the courts of any other jurisdiction that would give effect to such conversion being made on such date, or, the date on which the judgment is given, in the case of any proceeding in the courts of any other jurisdiction (the applicable date as of which such conversion is made pursuant to this paragraph being hereinafter referred to as the “**Judgment Conversion Date**”). If, in the case of any proceeding in the court of any jurisdiction referred to in the preceding sentence, there is a change in the rate of exchange prevailing between the Judgment Conversion Date and the date of actual receipt for value of the amount due, Guarantor shall pay such additional amount (if any and in any event not a lesser amount) as may be necessary to ensure that the amount actually received in the Judgment Currency, when converted at the rate of exchange prevailing on the date of payment, will produce the amount of the Obligation Currency which could have been purchased with the amount of the Judgment Currency stipulated in the judgment or judicial order at the rate of exchange prevailing on the Judgment Conversion Date.

This Guarantee shall be governed by, and constructed in accordance with, the laws of the State of Texas, without regard to any rule or provision on conflict of laws.

Any dispute relating in any manner to this Guarantee shall be resolved through binding arbitration. Arbitration proceedings shall be conducted pursuant to the International Arbitration Rules of the American Arbitration Association (AAA) in effect at the time the dispute first arises by one (1) or three (3) arbitrator(s) appointed in accordance with such Rules within ten (10) calendar days of submission of the dispute. The number of arbitrators forming the arbitral panel shall be mutually agreed upon by the parties, but if they cannot agree, then the AAA shall determine same. The arbitration shall be held in such city as is agreed upon by the parties, but if they cannot agree, then such arbitration shall be held in Austin, State of Texas, United States of America. The arbitration shall be conducted simultaneously in English and in the primary language of Guarantor. The English version of this Guarantee shall be the controlling document in the arbitration proceeding. The procedural laws of the civil district courts of the State of Texas, U.S.A. shall govern the arbitral proceeding regardless of the situs of the arbitration. The arbitral panel shall set a limited time period and establish procedures designed to reduce the cost and time for discovery, while allowing the parties an adequate opportunity, in the discretion of the arbitral panel, to discover relevant information from opposing parties about the subject matter of the dispute. The arbitral panel shall award actual damages to the prevailing party, but may not award any special, indirect, punitive or consequential damages nor reasonable attorneys fees and arbitration costs to either party. The arbitral award shall fully and finally settle the dispute. Recognition and enforcement of the arbitral award shall be governed by the 1958 New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards. Judgment upon the award may be entered in any court in any country, or application may be made to such court for a judicial acceptance of the award and an order of enforcement, as the law of such jurisdiction may require or allow. Each party shall bear its own costs and fees, including, but not limited to its share of any arbitration fees.

BY AGREEING TO BINDING ARBITRATION, THE PARTIES IRREVOCABLY AND VOLUNTARILY WAIVE ANY RIGHT THEY MAY HAVE TO A TRIAL BY JURY IN RESPECT OF ANY CLAIM. FURTHERMORE, WITHOUT INTENDING IN ANY WAY TO LIMIT THIS AGREEMENT TO ARBITRATE, TO THE EXTENT ANY CLAIM IS NOT ARBITRATED, THE PARTIES IRREVOCABLY AND VOLUNTARILY WAIVE ANY RIGHT THEY MAY HAVE TO A TRIAL BY JURY IN RESPECT OF SUCH CLAIM. THIS PROVISION IS A MATERIAL INDUCEMENT FOR THE PARTIES ENTERING INTO THIS GUARANTEE.

QSE: \_\_\_\_\_  
[Name of QSE]  
a \_\_\_\_\_  
[Type of entity/jurisdiction of organization]

Date of QSE Agreement: \_\_\_\_\_, 200\_\_.

EXECUTED by GUARANTOR this \_\_\_ day of \_\_\_\_\_, 200\_\_:

\_\_\_\_\_  
[Name of Guarantor]

Address: \_\_\_\_\_

\_\_\_\_\_

a \_\_\_\_\_  
[Type of entity/jurisdiction of organization]

Telephone: \_\_\_\_\_

Facsimile: \_\_\_\_\_

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

ACCEPTED by ERCOT this \_\_\_ day of \_\_\_\_\_, 200\_\_

ELECTRIC RELIABILITY COUNCIL  
OF TEXAS, INC.

Address: 7620 Metro Center Drive  
Austin, Texas 78744  
[For notice and payment]

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Telephone: 512.225.7070

Facsimile: 512.225.7079

2005  
ERCOT Methodologies for Determining  
Ancillary Service Requirements

Effective January 1, 2005

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## **Executive Summary**

Protocol 6.4.1(2) requires that ERCOT, at least annually, establish methodologies for determining the minimum quantity requirements for each Ancillary Service needed for reliability. Protocol 6.4.1(4) requires approval of this methodology by the ERCOT Board of Directors.

This document discusses the requirements of the following services:

- Responsive Reserves (RRS),
- Regulation Reserve Service (RGRS),
- Non-Spinning Reserves (NSRS),
- Replacement Reserves, and
- Balancing Energy (including minimum Down Balancing).

For detailed descriptions of these services and their deployment, see Protocol Sections 2 and 6.

Further, detailed methodologies for determining the requirements are attached as part of this document.

## **Responsive Reserve Service Requirement (RRS)**

Responsive Reserves are resources ERCOT maintains to restore the frequency of the ERCOT System within the first few minutes of an event that causes a significant deviation from the standard frequency. The ERCOT Operating Guides set the RRS requirement at 2300 MW for all hours under normal conditions. The Operating Guides allow ERCOT to increase that requirement under extreme conditions. This quantity will be used until it is determined that a change is appropriate. At that time, a revised methodology will be developed and presented to ERCOT TAC and the ERCOT Board for approval.

### ***RRS Provision by LAARs***

One type of Responsive Reserve is Interruptible Responsive Reserve. Interruptible Responsive Reserve is Load Acting as a Resource (LAAR) that is automatically interrupted when system frequency decreases to 59.7 Hz.

Protocols allow ERCOT to set the percentage of Responsive Reserve that may be served by LAARs. ERCOT calculates the maximum amount of RRS that can be securely provided by LAARS by performing stability analysis of several power flow cases, modeling the ERCOT transmission/generation system at different states. ERCOT will examine these models' response to generator trip events and the response of LAARS/Generation to recover frequency using different generation/LAAR amounts.

The ERCOT Protocols state, "The amount of Resources on high-set under-frequency relays providing RRS will be limited to 50% of the total ERCOT RRS requirement. ERCOT may reduce this limit if it believes that this amount will have a negative impact on reliability or if this limit would require additional Regulation to be deployed as prescribed in section 6.4.1, Standards for Determining Ancillary Services Quantities."

Self arranged Responsive Reserve used to fulfill a QSE's Responsive Reserve requirement must be at least (100% – maximum LAAR %) % from generation resources. ERCOT procured Responsive Reserve to provide the difference between the 2300 MW system requirement and the amount of Responsive Reserve self arranged by all QSEs must also be at least (100% – maximum LAAR %) % from generation resources.

If the maximum LAAR % level specified in the Protocols is changed, that change will be reflected in these requirements.

## **Regulation Reserve Requirement**

Introduction

Regulation Reserves are resources that can be deployed by ERCOT in response to changes in ERCOT System frequency to maintain the target ERCOT System frequency within predetermined limits according to the Operating Guides. ERCOT is required to evaluate normal requirements for Regulation Service – Up (regulation up) and Regulation Service – Down (regulation down) on an annual basis. It is ERCOT’s intent to use historical rates of regulation usage to perform this evaluation.

ERCOT proposes that this normal regulation requirement may be increased by a multiple of two (2) during projected severe stress conditions such as forecasted extreme weather days.

#### Summary

To evaluate regulation requirements, ERCOT collects monthly historic deployed regulation data. These data were used to calculate average historically deployed regulation for five-minute periods. By calculating the mean and standard deviation of the amounts of deployed regulation up and deployed regulation down, ERCOT expects it can predict the expected needs for similar months.

By arranging for 2.5 standard deviations times the historic average usage for each hour’s requirement; ERCOT provides the mathematical expectation that sufficient regulation will be available 98.8% of all periods. This requirement may appear excessive until you realize that this implies that 1.2% of every month, or 35 intervals/month; ERCOT expects to exhaust available regulation services.

#### Procedure

Using archived data, ERCOT will calculate the mean and standard deviation of actual regulation deployed daily for the previous month and the same month of the previous year. Using this data ERCOT will select multiple hour periods of “similar” amounts of reserve deployment, and will, for each of these blocks, select the maximum “average” RRS deployment + 2.5 Standard deviations for the requirement for this block of hours. ERCOT will define between 4 and 6 blocks for each day, and each block may have a different number of hours. The purpose of the blocks is to facilitate market operations.

ERCOT will calculate and post this requirement by the 20<sup>th</sup> of each month for each day of the succeeding month as required by the Protocols.

If experience indicates that these methods result in repeated shortages of regulation up or regulation down reserves, ERCOT may increase the regulation requirement. Before such an increase is applied, ERCOT shall post a message on the Market Information System. ERCOT shall also provide a report to TAC and the Board of Directors explaining its actions and new methodology at their next meeting.

#### **Non-Spinning Reserve Requirements**

Non-Spinning Reserve Service (NSRS) consists of resources capable of being ramped to a specified output level within thirty (30) minutes, or Loads acting as a Resource that are capable of being interrupted within thirty (30) minutes. NSRS is used to replace lost/unavailable generating capacity, or to compensate for load forecast errors on days in which sufficient spinning reserves are not available. Spinning reserves are defined as online, unloaded Resource capacity, which is not dedicated for other uses except RRS.

ERCOT will purchase NSRS when the projected risk of insufficiency is higher than normal, such as when hot, cold, or uncertain weather is expected, or when amounts of projected spinning reserves (including RRS) fall below 4,600 MW.

Historically, the need for NSRS has occurred during the following conditions:

- Across peak hours during spring and fall months when hotter than expected weather with large amounts of capacity offline
- Summer seasons when high loads and unit outages outstripped the capability of base load and normal cyclic units.
- Cold weather events when early morning load pickup outpaced the ability of generation to follow.
- Major unit trips when large amounts of spinning reserve were not online.

In each case, the need for quick start non-spinning reserve has been evident when there is not a large excess of spinning reserve on line.

ERCOT believes spinning reserves of 4600 MW (including RRS) is sufficient for normal weather conditions. The April-May and October transition months are not considered “normal” due to a larger than normal probability of significant load forecast error.

For the purpose of this document, extreme weather days are defined as days in which the forecast peak temperature for ERCOT is projected to be higher than 95 degrees, or the forecast high temperature is lower than 30 degrees, or days in which ERCOT has issued an OCN, Advisory or Alert for adverse weather or an anticipated capacity shortfall. On extreme weather days, ERCOT will purchase an amount of NSRS equal to the largest unit online for on-peak hours, and may purchase amounts of NSRS greater than this amount in extreme circumstances.

ERCOT will normally use the following in determining the amount of NSRS needed:

1. Review the weather forecast for the next day and see if it differs significantly from the current day.
2. If the next day forecast is “similar” to the current day forecast, and the current day forecast high temperature is <95 degrees in Dallas/Ft. Worth or Houston, and the current day low temperature is greater than 30 degrees, and the current day generation plan shows >4600 MW of spinning reserve (including RRS) online all day long, and the current month is not April, May, or October, THEN no NSRS is considered to be required all day for the next day.
3. Otherwise purchase NSRS using the following:
  - If the current month is April, May or October, then purchase NSRS in amounts equal to the largest unit online for the hours projected within 85% of peak hour.
  - If today’s and tomorrow’s ERCOT high temperature is projected above 95 degrees in Dallas/Ft. Worth or Houston, then purchase NSRS in amounts equal to the largest unit online for the hours projected warmer than 95 degrees.
  - If tomorrow’s low temperature forecast is projected below 30 degrees in Dallas/Ft. Worth or Houston, then purchase NSRS in amounts equal to the largest unit online for the projected morning load pickup hours and hours projected within 85% of peak hour.
  - Purchase amounts of NSRS equal to the largest unit online for hours in which the Day Ahead operator estimates spinning reserves online will drop lower than 4600 MW.

### **Replacement Reserve Requirements**

The purpose of RPRS is to insure the availability of capacity from resources such that the energy from those resources would be available to solve the following system security violations:

- a) Local congestion
- b) ERCOT system capacity insufficiency
- c) Zonal Congestion

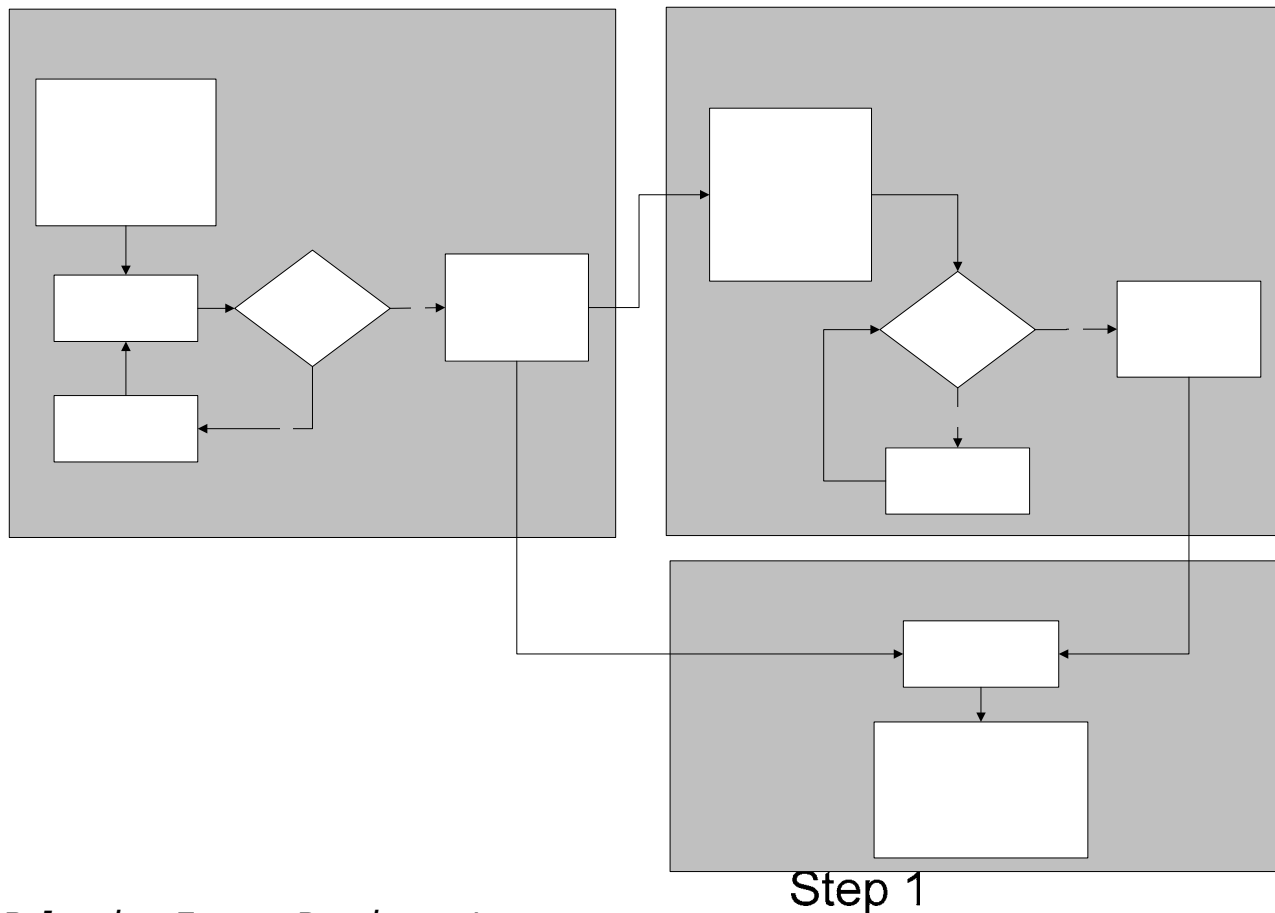
The RPRS analysis performs look-ahead analysis of the physical system for each of the hourly time intervals in either the Day Ahead or Adjustment Period Time frame. Based on the study, RPRS procurements are made if the submitted resource plans indicate capacity inadequacy or potential zonal or local congestion for which specific

resources are needed to resolve. The procured capacity from these resources must be bid into the Balancing Energy Service market, during the hours for which the RPRS was procured.

The procurement for resolving local congestion is based on a minimal cost approach that uses generic costs for resources and the procurement for capacity insufficiency and zonal congestion. Hence, the objective of the proposed RPRS market clearing is to minimize the total bid-based cost of procuring the RPRS bids for the whole duration of the Replacement market (i.e. the whole day for Day Ahead Market and the specified time duration for the Adjustment Period) subject to the security constraints not being violated.

If the RPRS analysis software fails to solve correctly, ERCOT staff may OOMC units for security and reliability based upon offline studies.

**Figure - Flow diagram for the RPRS market clearing engine**



**Balancing Energy Requirement**

Balancing Energy is incremental or decremental energy dispatched by ERCOT by 15-minute Settlement Interval to meet the difference between generation scheduled by the market and ERCOT System load. Local Balancing Energy Service is also used to resolve local transmission congestion. Balancing Energy is deployed by ERCOT with the goals that (1) Regulation Service in either direction not be depleted during the interval, (2) Regulation Service up and down energy is deployed in each Settlement Interval such that the net energy in regulation is minimized, and (3)

- Energy Schedules
- Resource Plans
- Load Forecast
- AS schedules
- Network model
- Start Up / Min Load costs
- Operational constraints

to provide for frequency control. ERCOT will estimate Balancing Energy needs based on the actual Load, the difference in forecasted Loads and bilateral schedules, deployed Regulation Service, and forecasted Congestion.

The following three-step approach is used to determine amount and location of BES needed in each Settlement Interval.

Step 1 is to determine balancing energy service needs to resolve generation-load balance and Zonal Congestion. Balancing Energy Service is procured with Local Congestion ignored, i.e., only recognizing Zonal Congestion.

The output of the application will be zonal MCPE, shadow prices of Zonal Congestion and Portfolio Incremental/Decremental balancing service MW needed by QSE and CM zone. An estimate will be made of Resource-specific MW outputs (this is intermediate solution and does not indicate resource-specific dispatch instructions).

Step 2 is to determine balancing energy service needs to resolve Local Congestion as well as generation-load balance and Zonal Congestion.

- 1) The transmission security analysis is performed with the MW solutions from Step 1 for checking operational security.
- 2) If no operational constraint violation is detected, the solution from Step 1 is the final solution to the balancing energy service market.
- 3) When any Local Congestion is violated, the solution proceeds as follows:
  - 3.1) The resource-specific incremental premium is taken as the prices for resource-specific incremental bids.
  - 3.2) The resource-specific decremental premium is taken as the prices for resource-specific decremental bids.
  - 3.3) The portfolio balancing service MW solutions by QSE and CM zone obtained in Step 1 are kept as the same at the portfolio level.
  - 3.4) The amount and location of balancing energy service is recalculated with the sum of the incremental and decremental bids cleared due to relief of Local Congestion across all zones to zero. All constraints, including Zonal Congestion and OC, are observed. The objective of Step 2 solution is to minimize the cost of Local Congestion. The output of the application will be as follows:
    - Portfolio Incremental/Decremental balancing service MW solutions by QSE and CM zone
    - Resource-specific MW outputs (resources that are identified to receive premiums will be sent resource-specific dispatch instructions.)
    - Shadow prices of Local Congestion

Step 3 is to determine balancing energy service needs to resolve generation-load balance and Zonal Congestion subject to the local constraint deployments made in step 2.

1. Balancing energy service market is cleared with Local Congestion ignored, but with the deployments made in step 2 preserved.
2. The market clearing prices from Step 3 will represent the marginal cost for the solution of each constraint and will be produced as an output of the mathematical optimization application. The output of the application will be as follows:
  - zonal MCPE
  - shadow prices of Zonal Congestion
  - Portfolio Incremental/Decremental balancing service MW needed by QSE and CM zone
  - Resource-specific MW outputs (this is intermediate solution and does not indicate resource-specific dispatch instructions).

### ***Minimum Balancing Energy Service (BES) Down Bid Percentage Requirement***

#### **For Frequency Control (to correct or avoid high frequency)**

Minimum Balancing Energy Service (BES) Down Bid Percentage Requirement will be set for all intervals of each day. A down bid percentage requirement will be determined to allow for correcting high frequency situations. This is a potential need for all intervals, but is especially needed during minimum load periods.

ERCOT will normally calculate the minimum down balancing requirement for QSE's as follows.

ERCOT will collect the amount of BES (up and down) deployed and the sum of schedules for each operating period in each of the two time frames described below:

- 1) Monthly data from the same month in the previous year.
- 2) Month to date data in the current month (one month prior to the month being analyzed). This interval will generally end on the 19<sup>th</sup> of the month prior to the month to be posted, as the requirements will be posted on the 20<sup>th</sup> of the preceding month.

From this data ERCOT will calculate the mean balancing energy deployed and a standard deviation. An amount of down balancing service expected to be sufficient to avoid exhausting the down balancing stack 99.9% of intervals will then be calculated. This amount of down balancing service, expressed as a percentage, will normally be posted as the down balancing percentage requirement. (Note – single outlying historic deployments may be selected in place of this statistical analysis if review indicates such a requirement is justified.)

ERCOT may post this value to be the continuous requirement, or may further analyze the needs to provide a varying requirement by:

- Zone
- On Peak and Off Peak hours

ERCOT may change this requirement during the month if experience shows that the initially proposed requirement is insufficient.

For Congestion Management

If a need for additional down balancing is required in a single zone, or zones for congestion management, ERCOT expects that zonal assessment of the data discussed above will allow detection and posting of the need in advance. If this expectation is not correct, ERCOT may adjust the zonal down balancing requirement to address specific congestion events observed.