Public Utility Commission of Texas

Memorandum

TO: All Interested Parties
FROM: Eric S. Schubert, Wholesale Market Oversight
DATE: August 19, 2005
RE: Project 24255, Rulemaking Concerning Planning Reserve Margin Requirements, Resource Adequacy Strawman

Enclosed is the Resource Adequacy strawman developed by Commission staff (Staff).\(^1\) Staff has provided comments in the preamble on some of the subsections of the strawman to clarify intent of the strawman and has asked some questions for stakeholder comment. Some materials referenced in the preamble will be filed in Central Records early next week.

Staff will be hosting a workshop for stakeholders to discuss the details of the strawman with Staff on Wednesday, September 14, 2005 at 9:30 am at the Commissioners' Hearing Room, 7th Floor, William B. Travis Building, 1701 North Congress, Austin, TX 78701.

The deadline for filing comments in Central Records on the Resource Adequacy strawman is Wednesday, September 21, 2005.

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\(^1\) Parviz Adib, Rick Akin, Adrianne Brandt, Richard Greffe, David Hurlbut, Shmuel Oven, Keith Rogas, and Sam Zhou helped develop this strawman.
Commission Staff’s Resource Adequacy Strawman

Preamble

Subsection (a) General. Staff has no comments.

Subsection (b) Statement of opportunities (SOO).
Subsection (c) Projected assessment of system adequacy (PASA).
Subsection (d) Filing of resource and transmission availability information with ERCOT.

Because an energy-only resource adequacy mechanism has a less-restrictive system-wide offer cap, market participants need to have more transparency on resource and transmission availability as well as market conditions that might impact prices in ERCOT spot markets. The underlying purpose of these sections is to provide market participants with an organized and systematic preview of current and future ERCOT system and market conditions.

Staff reviewed how this information was presented in Australian electric market and adopted some of the same names of the documents for use in ERCOT. Staff anticipates that ERCOT would review the information provided in the Australian SOO and PASA and develop a comparable approach. Staff also anticipates some differences in the contents of an ERCOT SOO or PASA because of the structural and topological differences between the Australian market and the ERCOT markets. ERCOT currently is gathering and publishing some of this information, so the SOO and the PASA may be thought as a way to more systematically gather and share some of that information with market participants.

Subsection (e) Publication of resource and demand inputs to ERCOT markets.

In a capacity-and-energy resource adequacy mechanism, such as LICAP, a generation resource receives a capacity payment on the condition of a must-offer requirement and mitigated offer curves that are close to the units estimated short-run marginal cost (SRMC). Transparency of offer curves in such a situation may not be as critical because of the heavy mitigation involved.

Staff believes that in an energy-only resource adequacy mechanism allowing for much higher system-wide offer caps, that the transparency of offers and bids of individual market participants is critical for market participants to help the Commission police the market. The Australian market publishes offer curve information a day after a market closes. Staff believes that reducing the time between market closure and disclosure of offer and bid information will allow market participants to assist the market monitor in confronting improper market behavior or addressing the unanticipated consequences of the market design.
However, Staff has reason to believe that there is a risk of tacit collusion among resource owners to raise prices if this resource-specific information is published too soon after the market closes. The prevailing theory in the economic literature in industrial organization recognizes that the possibility of cheating on collusive price fixing is essential to the destabilization of collusive behavior:

Following Stigler (1964), as developed by Green and Porter (1984), economists have focused on the importance of the observability of cheating to collusive stability. When cheating cannot be observed, it is harder to give firms an incentive not to cheat. It is more likely that collusion will be disrupted by cheating or by events that are empirically indistinguishable from cheating.¹

In the same way that timely information about output from individual members of a cartel can help enforce restricted output and higher prices within that cartel, frequent disclosure of recent offer curves could enable ERCOT market participants to adjust their offer curves in a way that promote tacit collusion. This same information could allow market participants involved in this tacit collusion to observe and subsequently punish deviations from a collusive equilibrium.

While the Australian market has not experienced a problem with tacit collusion, Staff believes that certain features of Australian regulatory oversight that can't be replicated in ERCOT might be preventing such tacit collusion. Staff has offered a question for stakeholders on the timing of publishing aggregated and disaggregated inputs to ERCOT-run ancillary service capacity and energy markets.

**Subsection (f) Approval of planned transmission and generation outages.** The purpose of this section is to recognize that if the system-wide offer cap rises under an energy-only resource adequacy mechanism, then the impact of transmission and generation outages on spot market prices could be significantly larger. As such, ERCOT needs to develop a system that considers the impacts of planned transmission and generation outages on market participants while maintaining system reliability.

**Subsection (g) Credit standards for load-serving entities.** Staff has no comments.

**Subsection (h) Improving price responsiveness of load.** Increasing the responsiveness of demand is a goal of this rule and critical to the success of an energy-only resource adequacy mechanism. This subsection proposes a mechanism that will keep the Commission informed on the review and implementation of cost-effective changes at ERCOT that would improve the price responsiveness of load. Staff notes that some related issues may be raised in Project No. 31418, *Advanced Metering Rulemaking*.

**Subsection (i) Scarcity pricing mechanism (SPM).**

Level of the system-wide offer cap. Staff believes that the Australian offer cap of $A 10,000 ($US 7,500) and the weekly cap on earnings (the Cumulative Price Threshold) seemed geared to addressing the Australian market’s load duration curve. The attached documents show that in key parts of the Australian market, the level of peak load compared to the 98 percentile of load is much higher in South Australia (SA) and Victoria (VIC) than in ERCOT. Staff believes that differing weather patterns may account for the difference in load duration curves. ERCOT has higher average summer temperatures than in SA and VIC, but SA and VIC have summer peak temperatures significantly higher than their summer average temperatures and even ERCOT peak summer peak temperatures. Also, summers are longer in ERCOT than in the parts of temperate Australia served by the Australian electricity market.

Given that ERCOT has a longer summers with high temperatures, peaking generation resources have more hours to recover their fixed costs than in the Australian market. As such, Staff determined that a lower system-wide offer cap would be appropriate for the ERCOT market.

Annual resource adequacy cycle. One of the goals of an energy-only resource adequacy mechanism is to incent long-term bilateral contracting and reduce the reliance of LSEs on the ERCOT spot market for serving their load. By starting on October 1 of each year, it is very likely that the high offer caps would be in place during the summer peak to allow resources the possibility of earning inframarginal profits during the summer.

Resource-specific offer caps. A key difference between the Australian market and the upcoming Texas Nodal market is the treatment of local (non-competitive) constraints. The strawman anticipates that ERCOT will ensure that load is protected from abuse of local market power while providing a scarcity pricing mechanism when system-wide conditions merit high market clearing prices in a way that is consistent with Substantive Rule 25.502(g).

Trigger for LCAP. The SPM measures the amount of profit above operating costs that new peaking generation resource would have earned during an annual resource adequacy cycle if it had continuously offered ERCOT its entire output into an ERCOT-procured energy market. When those profits equal the annual fixed cost of a new peaking generation unit, the IMM resets the system-wide offer cap to the LCAP for the remainder of the annual resource adequacy cycle.

Subsection (j) Authority to enter into capacity adequacy resource (CAR) contracts to sustain reliability. This subsection describes a backup mechanism for ERCOT to purchase resources to maintain system-wide reliability. A comparable mechanism is used in the Australian market. Comments on individual subsections are as follows:

(j)(3) - The requirement to have ERCOT contract two years out for generation is to ensure contestability for new and existing generation to reduce market power concerns in procuring a generation resource to meet system-wide reliability needs.
(4)(i) The must-offer provision at the system-wide cap allows ERCOT to meet its reliability needs without depressing scarcity pricing when the resource is deployed. 

(4)(ii) The termination of the interconnection agreement between an existing resource and ERCOT is necessary to reduce the possibility of existing generation resources to use the threat of physical withholding as a means to game the CAR contracting process. The strawman does not impose a similar restriction on new generation resources, as they would likely be in a position to be competitive in the market and in most cases would just enter the market directly rather than being awarded a CAR contract.

(4)(iii) A reliability problem may occur if a resource owner decides to retire a plant without a two-year notice that would be reflected in a previous SOO or PASA that would signal to market participants that new generation resources would be needed in the market. As with RMR contracts that address local reliability, this strawman proposes a means for ERCOT to offer a CAR contract to a resource that might be needed for system reliability. Such a resource would be compensated with a cost-plus contract to discourage gaming of the CAR contracting process by exerting market power to get a substantial guaranteed return from the CAR contract rather than trying to earn revenue through offers that reflect the generation resource’s operating and fixed costs.

(5) This subsection allows ERCOT to credit those LSEs that have contracted or self-arranged resources to reduce or avoid their uplifted costs of CAR contracts. The specific provisions of this mechanism, while being left to ERCOT to develop, should have as a goal the elimination of free riding of procuring resources and promotion of long-term bilateral contracting between resources and load.

(6) The additional risk for a load-serving entity that needs to pay for a portion of a CAR contract should be reflected in its ERCOT credit standing. As such, the potential impact would encourage LSEs to increase their bilateral contracting.

Subsection (k) Development and implementation. Staff has no comments.

Change in Substantive Rule 25.502 (d) and (h). As part of this strawman proposal, Staff proposes to change relevant parts of S.R. 25.502.

Workshop and Deadline for Comments

Staff will be hosting a workshop to discuss the details of the strawman on Wednesday, September 14, 2005 at 9:30 am at the Commissioners’ Hearing Room, 7th Floor, William B. Travis Building, 1701 North Congress, Austin, TX 78701.

The deadline for comments on the Resource Adequacy strawman is Wednesday, September 21, 2005.
Questions for Stakeholders

1. Subsection (e), Publication of Resource and Demand Inputs to ERCOT Markets. A key goal of this rulemaking is to make the operations of ERCOT markets more transparent to market participants. Within the industrial organization academic literature, however, there is a body of work that suggests that tacit collusion may occur if disaggregated market information is published shortly after the clearing of a market. (See attached)

   a. How substantial is the risk of tacit collusion in ERCOT markets? Please give the reasoning behind your position and how the characteristics of the ERCOT market influence your position.
   b. When should the disaggregated market information be published to meet the goals of market transparency without facilitating tacit collusion? Should the timing of publishing aggregated and disaggregated market inputs differ? If so, why?

2. Subsection (h) Improving the Price Responsiveness of Load. The strawman lists two tasks that ERCOT shall undertake as part of its review of improving the price responsiveness of load. What other things related to the promotion of demand resources do you believe the Commission should order ERCOT to review?

3. Subsection (i), Scarcity Pricing Mechanism (SPM)
   a. Are the levels for the HCAP and LCAP appropriate for encouraging long-term bilateral contracting between load-serving entities and resource owners?
   b. Will the levels for the HCAP and LCAP provide sufficient revenues for owners of new peaking generation units to recover their fixed costs?
   c. Does the threshold for switching from the HCAP to the LCAP provide sufficient incentives to ensure adequate planning reserves for ERCOT?
   d. Does the SPM provide sufficient protection for load?

   If your answer is “no” to any of the questions above, please suggest alternatives and provide your reasoning for them.

4. Subsection (j), Ability to Enter into Capacity Adequacy Resource (CAR) Contracts to Sustain Reliability
   a. Will CAR contracts provide an adequate backstop to assure system reliability?
   b. Will the terms of the CAR procurement and deployment prevent strategic mothballing of generation resources?
   c. What, if any, additional necessary conditions should an LSE meet to be exempted from part or all of the uplifted costs of a CAR contract?
5. Do you believe that the transition plan and implementation date of the proposed rule will be timely and effective? If not, please provide alternatives and your reasons why your alternative is better.
Substantive Rule 25.505. Resource Adequacy in the Electricity Reliability Council of Texas Power Region

(a) General. The commission and the Electric Reliability Council of Texas (ERCOT) shall establish mechanisms that provide for resource adequacy to be achieved through an energy-only market design. The mechanisms shall encourage market participants to build and maintain a mix of resources that sustain ERCOT reliability through such means as hedging, long-term contracting between resources and load, and price responsiveness of load.

(b) Statement of opportunities (SOO). ERCOT shall publish an SOO on or around October 1 of each year that provides market participants with a projection of the ability of existing and planned resources, including load resources, and transmission facilities in ERCOT to meet ERCOT’s projected electricity demand and system reliability needs over the next ten years. At a minimum, resource entities and transmission service providers (TSPs) shall report to ERCOT their plans for adding new facilities, upgrading existing facilities, and mothballing or retiring existing facilities.

(c) Projected assessment of system adequacy (PASA). ERCOT shall provide market participants with information to assess the adequacy of resources and transmission facilities to meet projected demand in the following two reports:

(1) Medium-Term PASA. Each week, ERCOT shall publish a Medium-Term PASA for each week of the subsequent two years beginning with the week after the Medium-Term PASA is published. Each Medium-Term PASA shall, at a minimum, include the following information:
   i. Load forecast by ERCOT zone or area;
   ii. Ancillary capacity service requirements;
   iii. Transmission constraints, including planned outages; and
   iv. Aggregated information on the availability of resources, including load resources.

(2) Short-Term PASA. Each day, ERCOT shall publish a Short-Term PASA for each hour for the seven days beginning with the day the Short-Term PASA is published. Each Short-Term PASA shall, at a minimum, include the following information:
   i. Load forecast by ERCOT zone or area;
   ii. Ancillary capacity service requirements;
   iii. Transmission constraints, including planned outages; and
   iv. Aggregated information on the availability of resources, including load resources.

(d) Filing of resource and transmission availability information with ERCOT. ERCOT shall determine the inputs it needs from TSPs and resource entities to prepare PASAs and shall set the timetable that TSPs and resource entities shall
follow in updating inputs for PASAs. At a minimum, the following information shall be filed with ERCOT:

(1) Transmission outages. TSPs shall provide ERCOT with information on planned and forced transmission outages.

(2) Resource outages. Resource entities shall provide ERCOT with information on planned and forced resource outages.

(3) Availability of resources. Resource entities shall provide ERCOT with a complete list of resource availability and performance abilities, such as, but not limited to:
   i. the net dependable capability of generation and load resources;
   ii. projected output of non-dispatchable resources such as wind turbines, run-of-the-river hydro, and solar power; and
   iii. output limitations on resources because of fuel or environmental restrictions.

(e) Publication of resource and demand inputs to ERCOT markets. As part of its responsibility to provide transparency to the operation of ERCOT markets, at a minimum ERCOT shall publish the following information:

(1) Aggregated offer and bid curves. ERCOT shall publish the following information 48 hours after the market has closed:
   i. Aggregated hourly resource offer information for energy and ancillary capacity service as well as aggregated energy offers for every time interval made within each zone. ERCOT shall publish the aggregated offer curves of offers from all resources, including virtual and load resources, made within a load zone.
   ii. Aggregated hourly demand bid information. ERCOT shall publish the aggregated day-ahead bid curves from all loads, including virtual loads, and realized demand for each time interval, made within a load zone.
   iii. Dynamic scheduling. ERCOT shall publish the aggregated load and resource output for all entities that dynamically schedule their resources with a load zone.
   iv. Bilaterally scheduled hourly load. ERCOT shall publish the aggregated hourly firm bilaterally scheduled load and hour bilaterally scheduled load with “up to” limits on congestion charges made within a zone.
   v. Self-provided reserves. ERCOT shall publish aggregated hourly self-provided ancillary services capacity by type of capacity within a zone.

(2) Disaggregated offer and bid curves. ERCOT shall publish the following information 48 hours after the market has closed:
   i. Resource-specific offer information. ERCOT shall publish the offer curve for all resources and virtual offers and all other resource-specific information for each resource at each settlement.
point and settlement interval. The information published shall be clearly linked to the name of the resource, the name of the entity submitting the offer, and the name of the entity controlling the resource. If there are multiple offers for the resource, then ERCOT shall publish similar information for each offer for the resource, including the name of the entity submitting the offer and the name of the entity controlling the resource.

ii. Load-specific bid information. ERCOT shall publish the bid curve for each load and virtual demand bids for each resource at each settlement point and settlement interval. The information published shall be clearly linked to the name of the load, the name of the entity submitting the offer, and the name of the entity controlling the load.

iii. Dynamic scheduling. ERCOT shall publish the load and resource output for each entity that dynamically schedules its resources.

iv. Bilaterally scheduled hourly load. ERCOT shall publish the disaggregated hourly firm bilaterally scheduled load and hour bilaterally scheduled load with “up to” limits on congestion charges made within a zone.

v. Self-provided reserves. ERCOT shall publish disaggregated hourly self-provided ancillary services capacity by type of capacity within a zone.

vi. Virtual offers and bids. In publishing disaggregated information related to offer and bid curves, ERCOT shall identify which offers and bids were virtual.

(f) Approval of planned transmission and generation outages. ERCOT shall approve all transmission and generation outages. When ERCOT decides whether to approve outages, it shall consider their impact on reliability, the outage costs to TSPs and production costs of resource entities, and costs to markets that ERCOT operates.

(g) Credit standards for load-serving entities. ERCOT shall maintain credit standards for load-serving entities (LSEs) or qualified scheduling entities that are consistent with this section.

(h) Improving price responsiveness of load. ERCOT shall work with market participants to create the necessary conditions for, and remove impediments to, price response by load. As part of this process, ERCOT shall file progress reports at the Commission six, eighteen, and thirty months after the implementation of this rule that identify impediments to price response by load, proposed solutions that address those impediments, and progress made in removing those impediments. As part of the report, at a minimum, ERCOT shall:
(1) Conduct a review of the compatibility of existing load profiles with market-based demand-side offerings by LSEs, such as time-of-use pricing and direct load control programs; and

(2) Estimate the incremental costs of installing interval data recording meters for commercial and industrial customers that use load profiles for settlement.

(i) Scarcity pricing mechanism (SPM). The Independent Market Monitor (IMM) selected by the commission pursuant to Texas Utilities Code Section 39.1515 shall administer an SPM that allows resource entities reasonable opportunities to recover their operating and fixed costs through bilateral contracting and ERCOT-operated ancillary service energy and capacity markets. The IMM shall file for commission approval its proposed SPM and any subsequent proposed changes. The SPM shall commence on October 1, 2007. As part of administering the SPM, the IMM shall undertake following:

(1) Annual resource adequacy cycle. The IMM shall apply the SPM on an annual resource adequacy cycle, starting on October 1 of each year and ending on September 30 of the following year.

(2) Peaking generation operating cost (PGOC). The IMM shall estimate the hourly short-term operating costs of a new peaking generation unit.

(3) Peaking generation fixed cost (PGFC). The IMM shall estimate the annual fixed cost of a new peaking generation unit.

(4) Peaking generation profit margin (PGPM) The IMM shall track the PGPM, which are the earnings above the PGOC enjoyed by a peaking generation unit that would have offered its entire output into ERCOT-operated ancillary service energy markets since the beginning of the annual resource adequacy cycle.

(5) System-wide offer caps. The IMM shall administer the system-wide offer caps as follows

i. On October 1, 2007, the IMM shall set the high system offer cap (HCAP) at $3,000 per megawatt-hour (MWh) and $3,000 per megawatt (MW) per hour. The IMM shall set the low system offer cap (LCAP) at $500 per MWh and $500 per MW per hour.

ii. On October 1, 2008, the IMM shall set the HCAP at $4,000 per MWh and $4,000 per MW per hour.

iii. Beginning October 1, 2009, the IMM shall maintain the HCAP at no lower than $3,000 per MWh and $3,000 per MW per hour and at no higher than $5,000 per MWh and $5,000 per MW per hour.

iv. The IMM shall maintain the LCAP at no lower than $300 per MWh and $300 per MW per hour and at no higher than $700 per MWh and $700 per MW per hour.

v. On October 1 of each year, the IMM shall set the system-wide offer cap equal to the HCAP and maintain the HCAP at this level as long as the PGPM during an annual resource adequacy cycle is below the PGFC. If the PGPM exceeds the PGFC, the IMM shall
reset the system-wide offer cap at the LCAP for the remainder of the annual resource adequacy cycle.

(6) **Resource-specific offer caps.** The IMM shall set an offer cap for each resource that protects load from abuse of local market power on transmission constraints that are deemed to be non-competitive.

(7) **Annual report.** The IMM shall conduct an annual review of the effectiveness of the SPM and file a report on that review with the Commission by June 1 of each year. The report shall include the following information:

i. Recommendations for the levels of the system-wide offer caps, PGOC, and the PGFC, that would be consistent with the entry and maintenance of sufficient resources to sustain ERCOT reliability, while preventing transfers of money from LSEs to resource entities that are in excess of those needed to maintain resource adequacy.

ii. A review of all market mitigation mechanisms, including local market power mitigation procedures, with any recommended changes that would ensure the consistency of such mechanisms with the SPM.

This paragraph does not preclude the IMM from requesting commission approval of changes to the SPM at other times.

(j) **Authority to enter into capacity adequacy resource (CAR) contracts to sustain reliability.** If the resource adequacy mechanisms are at serious risk of substantially failing to provide ERCOT with sufficient amount of resources to serve system-wide load and provide operating reserves to maintain system-wide reliability, ERCOT may enter into CAR contracts to procure sufficient energy and operating reserves. ERCOT shall enter into CAR contracts pursuant to this subsection using the following procedures:

(1) The contracts shall have terms no shorter than 90 days but no longer than five years.

(2) ERCOT shall use the information provided in the PASAs as a benchmark for entering into a CAR contract.

(3) ERCOT shall purchase the services of any generation resource, including a new generation resource, at least two years prior to its use under the CAR contract.

(4) Generation resources are subject to the following terms and conditions for CAR contracts with ERCOT:

i. ERCOT shall require that a generation resource awarded a CAR contract have a must-offer requirement for the period of the contract with the offer curve set at the system-wide offer cap.

ii. The interconnection agreement between ERCOT and an existing generation resource shall terminate at the expiration of the CAR contract. The resource entity may reapply for an interconnection agreement to take effect eighteen months after the expiration of the
CAR contract. The interconnection agreement between ERCOT and a new generation resource that entered the market as part of a CAR contract will not be impacted by the expiration of the CAR contract.

iii. The owner of an existing generation resource must notify ERCOT at least 90 days before the potential retirement of the resource so that ERCOT can evaluate if ERCOT needs the resource to maintain system-wide reliability. If ERCOT deems it needs the generation resource, ERCOT shall enter into a contract with the resource owner up to 640 days. ERCOT shall provide the owner of the resource with cost-plus pricing for using the generation resource. Any money the resource owner makes from being deployed in the market above the cost-plus terms in the CAR contract will be refunded to load on an ERCOT-wide load ratio share basis.

(5) ERCOT shall uplift the costs of the CAR contracts on an ERCOT-wide load-ratio share basis, except that LSEs that can demonstrate to ERCOT that they have through ownership or firm contracts covered all or a portion of their load using resources dedicated to serving that load for the life of the CAR contract are exempt from the uplift for the amount of load so covered.

(6) ERCOT shall take into account current or potential uplift charges associated with this subsection in complying with subsection (g).

(7) This subsection does not limit ERCOT purchases for other reasons, such as the following:
   i. routine purchases of ancillary capacity services and energy in the ERCOT day-ahead and real-time markets;
   ii. reliability unit commitment (RUC);
   iii. black-start service; and
   iv. reliability must run (RMR) contracts that address local reliability concerns.

(k) Development and implementation. ERCOT shall use a stakeholder process to develop protocols that comply with this section. ERCOT shall file the protocols by February 1, 2007, for approval by the Commission. Nothing in this section prevents the commission from taking actions necessary to ensure that system reliability in ERCOT is sustained, including actions that are otherwise inconsistent with the other provisions in this section.

§25.502. Pricing Safeguards in Markets Operated by the Electric Reliability Council of Texas.

....

(d) Disclosure of offer prices. ERCOT shall publish on its market information system:
(1) no later than noon of the following calendar day, the identities of all entities submitting offers for which the energy offer price was $300 per megawatt-hour (MWh) or higher, or the capacity offer price was $300 per megawatt-per-hour (MW/h) or higher, and the corresponding settlement intervals and market locations;

(2) no later than noon of the following calendar day, the identity of any entity whose offer sets a price for energy above $300/MWh (along with the corresponding settlement interval and market location) and the identity of any entity whose offer sets a price for capacity above $300/MW/h (along with the corresponding settlement interval and market location); and

(3) concurrent with the publication of a corrected market clearing price, the identity of any entity who is paid more than the market clearing price for the service and the corresponding settlement interval and market location.

(h) **System-wide offer cap.** A supply offer shall not exceed $1,000/MWh or $1,000/MW/h before January 1, 2007. On January 1, 2007, a supply offer shall not exceed $2,000/MWh or $2,000/MW/h until this subsection expires upon the implementation of the system-wide offer caps in §25.505(i)(1).