



To RMR or Not to RMR: That is the Reliability Question

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News



ERCOT releases results of Reliability Must-Run studies under new rules

AUSTIN, TX, Oct. 17, 2016 – ERCOT **will not need** a cogeneration facility in the Houston area for transmission system reliability under new rules approved by its Board of Directors on Oct. 11. However, the electric grid operator **still needs** another Houston-area generation resource to support transmission reliability until a new plant, currently under construction in Wharton County, begins operating in summer 2017.

See the full text at ercot.com/news/releases

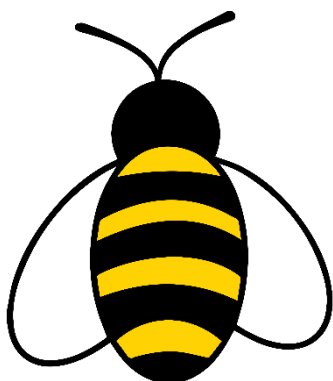
Why all the buzz on Reliability Must-Run (RMR)?

May 27, 2016 (Pre NPRR788)

Final determination: NRG Texas' Greens Bayou Unit 5 is needed to support ERCOT transmission system reliability.

October 17, 2016 (Post NPRR788)

Updated final determination: NRG Texas' Greens Bayou Unit 5 is still needed to support ERCOT transmission system reliability.

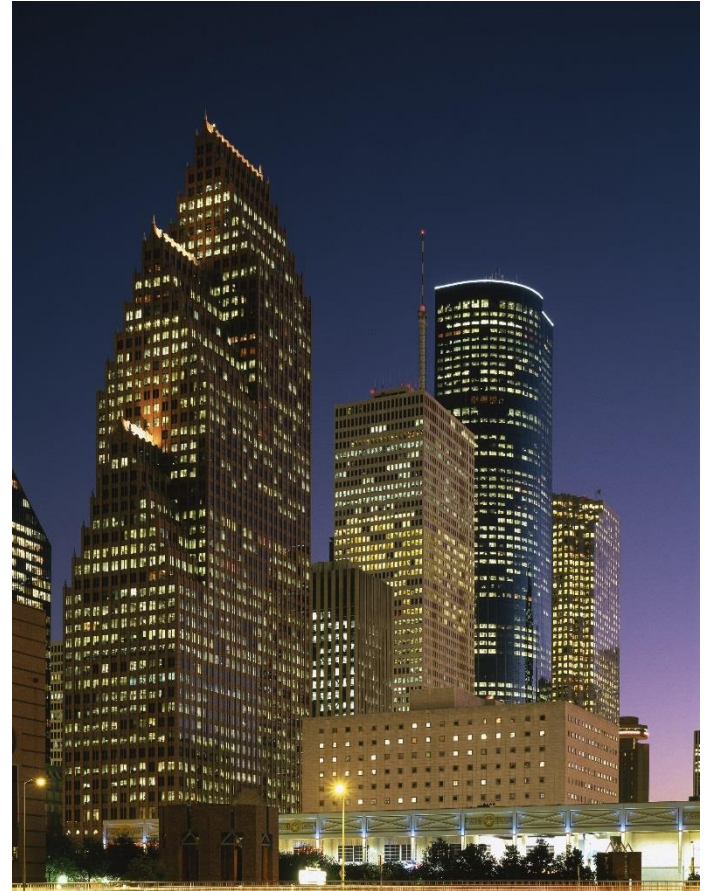


October 12, 2016 (Post NPRR788):

Final determination: Calpine Corp.'s Clear Lake facility is not needed to support ERCOT transmission system reliability.

What concern does the RMR address?

- Transmission system reliability in Houston area
- Singleton-to-Zenith line
 - Reliability concerns associated with generation and/or transmission resources



Back to 2004 – What say the Public Utility Commission of Texas (PUC) on RMR?

- PUC Project No. 27917, Rulemaking on Pricing Safeguards in ERCOT–Operated Wholesale Markets
- December 2, 2004, Open Meeting
 - Order adopting new P.U.C. Subst. R. 25.502, Pricing Safeguards in Markets Operated by the Electric Reliability Council of Texas.
 - Added Subsection (g) to ensure that a generation resource that ERCOT has determined is required for reliability remains in operation.
- Key Policy Statements
 - Reference **ERCOT statutory duty to ensure reliability** and referencing RMR need determination as “integral part of this responsibility.”
 - References **PURA 39.151** as source of authority and PUC oversight over ERCOT implementation
 - References **role of RMR in avoiding “unacceptable risks**, including blackouts” and in “controlling the risks to reliability at an acceptable level.”
 - Clarified that “all **market participants will share the responsibility** of maintaining RMR service in ERCOT.”

Applying 2004 PUC Order in ERCOT Protocols

- Current ERCOT Protocols
 - Section 3.14.1, Reliability Must Run.
 - Section 22, Attachment B: Standard Form Reliability Must-Run Agreement.
- ERCOT Protocols have remained mainly unchanged from zonal 2004 policy discussion to current nodal market.

What's News in 2016 – RMR returns

News



About the Reliability-Must-Run Agreement for Greens Bayou Unit 5

AUSTIN, TX, June 3, 2016 – ERCOT has determined that Greens Bayou Unit 5 is needed for transmission system stability in the Houston region.

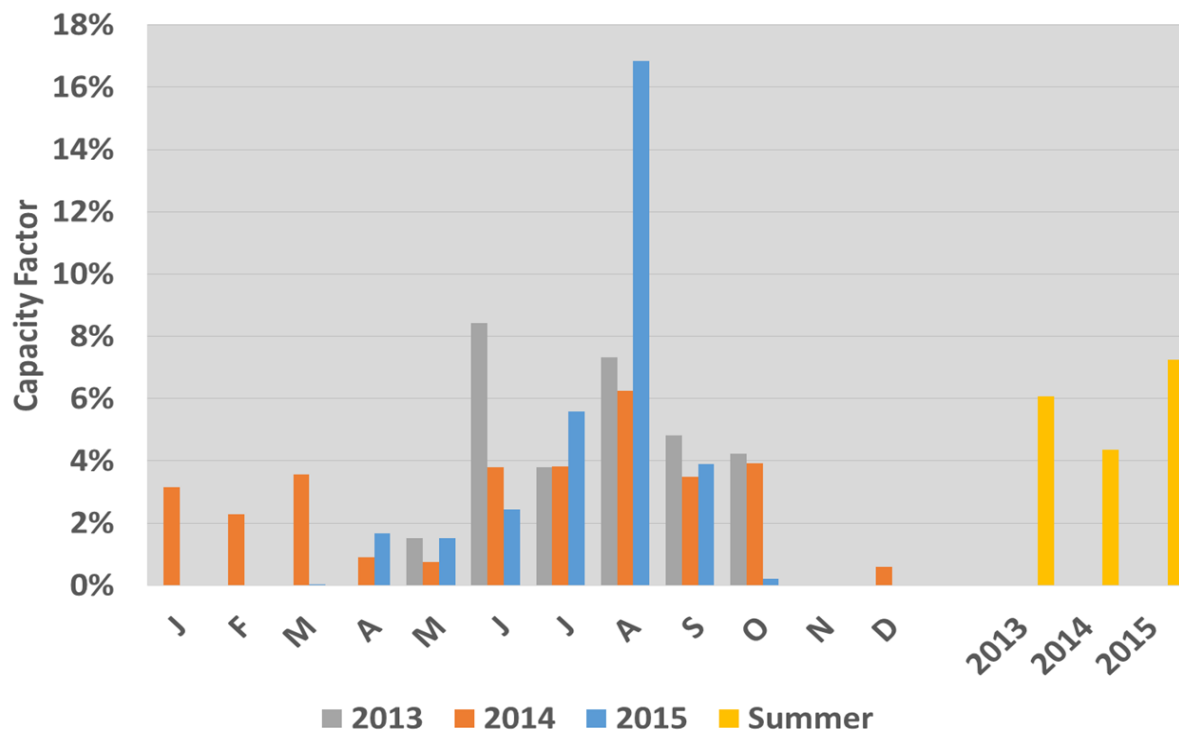
ERCOT has executed a Reliability Must-Run Agreement with the plant owner, NRG Texas Power, to keep the unit available this summer (through September 2016) and will ask the ERCOT Board of Directors in June to approve an extension of the agreement to keep the plant available during summer through June 2018.

See the full text at ercot.com/news/releases

NRG Texas Energy LLC – Greens Bayou Unit 5

- 371 MW unit
- Built in 1973, operating for 43 years
- Located in Houston
- Operated infrequently 2013 – 2015
 - Annual capacity factor <3%
 - Summer (June-September) capacity factor ~ 6%

Historical Operation



Greens Bayou Unit 5 – The RMR Process

March 29, 2016

NRG Texas submits NSO for Greens Bayou Unit 5.

- Seeks to suspend operation of (i.e., mothball) the Generation Resource indefinitely beginning June 27, 2016
- 90-day notice kicks off review process.



April 22, 2016

Protocol Section 3.141.2, ERCOT Evaluation

- Initial Determination (within 24 days) – may be needed for RMR Service
- Continue to evaluate the impacts and coordinate with Transmission Owners in an effort to develop alternative solutions.



Greens Bayou Unit 5 – The RMR Process

May 28, 2016

Final Determination – needed for RMR Service (within 60 days)

- Thermal violations noted under several G-1 + N-1 conditions
- Violations not resolved by future planned Generation Resources
- RMR alternatives not viable options for summer 2016 and 2017
- Operational mitigation plan would require load shed.

June 3, 2016

Issued Market Notice with information identified in Protocols

- Executed RMR Agreement (June 2) with NRG Texas Power LLC

Greens Bayou Unit 5 – The RMR Agreement

Standard Form Reliability Must-Run Agreement between NRG Texas Power LLC and ERCOT

- **371 MW of capacity:** Available all hours July through September 2016, June through September 2017, and June 2018.
- **Start Date: June 1, 2016**
- **Stop Date: June 30, 2018 (25 months)**
- **Estimated Standby Cost: \$3,185 per hour**
- **Eligible Cost Budget: \$58.1M**
 - Possible incentive, up to 10%, brings total to \$63.9M
 - 2017 Spring Outage: \$14.1M
- Continue to review budget with prospect of lowering overall costs.
- Costs will be trued up based on verified actuals.



NRG Texas Power Photo

Exit Strategies – How do we get out of the RMR?

- Protocol Section 3.14.1.4, *Exit Strategy from an RMR Agreement*.
 - Evaluated Must-Run Alternatives within 90 days as required
 - Reported results to Board and posted a list of feasible alternatives that may, in future, be more cost effective
- Ultimate Exit Strategy: Houston Import Project
 - Projected in-service date of May 2018
 - Resolves reliability violations
 - Exit strategy for Greens Bayou Unit 5 RMR Agreement
- Possible Alternative Exit Strategy
 - Colorado Bend Generating Station – 1,100 MW Natural Gas-fired Combined Cycle Plant
 - Expected to begin commercial operations at end of July 2017

Must-Run Alternatives – Anything as reliable but cheaper?

- Criteria for Must-Run Alternative (MRA) selection:
 - Acceptable solution to the reliability concern addressed by the RMR Unit
 - Provides at least \$1 million in annual savings
 - MRA Resource provider demonstrates ability to fulfill its performance obligations.
- Issued Request for Proposals (RFP) on July 13
- Received Qualified Scheduling Entity (QSE) proposals by Aug. 24
- Issued news release Sept. 19
 - No offers adequately met reliability need served by Greens Bayou Unit 5
 - Insufficient capacity offered to fulfill the criteria set forth in the RFP

Summer 2016 – Stakeholder Movement on RMR



Nodal Protocol Revision Requests (NPRRs) considered

- ERCOT Board on Aug. 9 rejected appeal by NRG Texas:
 - NPRR784, Mitigated Offer Caps for RMR Units
 - See Key Documents at ercot.com/mktrules/issues/NPRR784
- ERCOT Board on Oct. 11 approved:
 - NPRR788, RMR Study Modifications
 - See Key Documents at ercot.com/mktrules/issues/NPRR788
 - NPRR 793, Clarifications to RMR RUC Commitment and Other RMR Cleanups
 - See Key Documents at ercot.com/mktrules/issues/NPRR793
 - NPRR795, Provisions for Refunds of Capital Contributions Made in Connection with an RMR Agreement
 - See Key Documents at ercot.com/mktrules/issues/NPRR795
 - All three NPRRs became effective Oct. 12, 2016

Regulator Movement on RMR – What say the PUC?



September 16, 2016

P.U.C. Project No. 46369 –
Rulemaking Relating to
Reliability Must-Run Service

October 31, 2016

Initial comments due

October 10, 2016

- Releases staff Strawman and Request for Comments to amend P.U.C. Subst. R. 25.502.
- Lengthen the notice period (greater than 180 calendar days) for suspension of operation of generation resources and the timeline of the associated RMR complaint process.

Regulator Movement on RMR – What say the PUC?



November 28, 2016

Comments due from ERCOT and Independent Market Monitor (IMM)



November 14, 2016

Reply comments due



TBD

Workshop will subsequently be noticed in this Project.



New Reliability Criteria

- **NPRR788 (Effective October 12, 2016)**

- Without the Generation Resource, there are one or more Transmission Facilities loaded above their Normal Rating under pre-contingency conditions.
- Without the Generation Resource, there is any instability or cascading for any of the following conditions:
 - (A) Pre-contingency;
 - (B) Normal system conditions followed by the contingency loss of a generating unit, transmission circuit, common tower outage, transformer, shunt device, or flexible alternating current transmission system (FACTS) device;
 - (C) Unavailability of a generating unit, followed by Manual System Adjustments, followed by the contingency loss of a generating unit, transmission circuit, common tower outage, transformer, shunt device, or FACTS device; or
 - (D) Unavailability of a 345/138 kV transformer, followed by Manual System Adjustments, followed by the contingency loss of a generating unit, transmission circuit, common tower outage, transformer, shunt device, or FACTS device.
- Without the Generation Resource, there are **one or more Transmission Facilities loaded above 110% of the Emergency Rating** under normal system conditions followed by the contingency loss of a generating unit, transmission circuit, common tower outage, transformer, shunt device, or FACTS device.
- For paragraphs (i) through (iii) above the Generation Resource will only be deemed to have a **material impact** on a performance deficiency that is caused by a thermal overload(s) if the Generation Resource has **a more than 2% unloading Shift Factor on the Transmission Facility(s) that is overloaded and more than 5% unloading impact on the Transmission Facility(s) that is overloaded**. For purposes herein, an unloading impact is a measure of a reduction in flow on a Transmission Facility as a percent of its Rating due to a unit injection of power from the Generation Resource.

Post NPRR 788 World – Why you, and not you?

- **Greens Bayou Unit 5 – Supplemental Final Determination**

- Instability or cascading under defined conditions
- More than 2% unloading Shift Factor on the Singleton-Zenith 345 kV transmission lines
- Unloading impact greater than 5%



- **Calpine Corp. Clear Lake – Final Determination**

- Did not meet RMR criteria to be necessary to support ERCOT transmission system reliability



Where do we go from here?

“We cannot solve our problems with the same thinking we used when creating them.”

– Albert Einstein

