



Date: June 14, 2022
To: Board of Directors
From: Woody Rickerson, Vice President of System Planning and Weatherization
Subject: Approval of Methodology for Calculating Maximum Daily Resource Planned Outage Capacity

Issue for the ERCOT Board of Directors

ERCOT Board of Directors Meeting Date: June 21, 2022

Item No.: 11

Issue:

Whether the Board of Directors (Board) of Electric Reliability Council of Texas, Inc. (ERCOT) should approve the *Methodology for Calculating Maximum Daily Resource Planned Outage Capacity* as recommended by ERCOT staff, copy of which is attached hereto as **Attachment A**, effective upon system implementation of Nodal Protocol Revision Request (NPRR) 1108, ERCOT Shall Approve or Deny All Resource Planned Outage Requests.

Background/History:

In 2021, the 87th Texas Legislature passed Texas Senate Bill 3 (SB3), which includes a revision to Section 13 Subchapter A Chapter 35.0025 with the following language in paragraph (f): “The independent organization certified under Section 39.151 for the ERCOT power region shall review, coordinate, and approve or deny requests by providers of electric generation service described by Subsection (a) for a planned power outage during any season and for any period of time.” On April 28, 2022, the Board recommended approval of NPRR1108, which was subsequently approved by the Public Utility Commission of Texas (PUCT) on May 12, 2022. NPRR1108 defines a process by which ERCOT will review, coordinate, and approve or deny all Resource Planned Outages, including those that are submitted more than 45 days prior to the planned start of the Outage. In conjunction with existing Protocol provisions, the addition of this process will allow ERCOT to meet the requirements of Texas Senate Bill 3 related to approval of all Planned Outages of electric generation.

NPRR1108 adds to the Protocols new Section 3.1.6.13, paragraph (1) of which requires ERCOT to calculate the maximum capacity of Resource Planned Outages (Maximum Daily Resource Planned Outage Capacity) that should be allowed on each day of the next 60 months. ERCOT must calculate the Maximum Daily Resource Planned Outage Capacity for days more than seven days ahead of the Operating Day and for days that are seven days or less prior to the Operating Day. Paragraph (3) of Section 3.16.13 requires ERCOT to post the methodology used to calculate the Maximum Daily Resource Planned Outage Capacity on the ERCOT website, and that the methodology and any revisions thereto shall be approved by the Board.

Pursuant to the requirements outlined above, and in consideration of stakeholder comments received in response to ERCOT's methodology presentations and proposals publicly discussed since NPRR1108 was approved by the PUCT on May 12, 2022, ERCOT staff prepared a draft *Methodology for Calculating Maximum Daily Resource Planned Outage Capacity*, a copy of which is attached hereto as **Attachment A**. ERCOT presented the draft at the June 7, 2022 Technical Advisory Committee (TAC) meeting. TAC is expected to present its feedback on the *Methodology for Calculating Maximum Daily Resource Planned Outage Capacity* at the June 21, 2022 Board meeting.

Key Factors Influencing Issue:

- NPRR1108 requires that ERCOT adopt a methodology, to be approved by the Board, for the calculation of the maximum capacity of Resource Planned Outages that should be allowed on each day of the next 60 months.
- ERCOT staff has prepared a draft *Methodology for Calculating Maximum Daily Resource Planned Outage Capacity*, attached hereto as **Attachment A**, which is proposed for Board approval, effective upon system implementation of NPRR1108.
- ERCOT will review the proposed methodology at least annually and work with stakeholders to make adjustments if necessary to maintain grid reliability while accommodating the need from Resources to schedule their Planned Outages.

Conclusion/Recommendation:

ERCOT staff recommends that the Board approve the *Methodology for Calculating Maximum Daily Resource Planned Outage Capacity*, as set forth in **Attachment A**, effective upon system implementation of NPRR1108.



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

WHEREAS, Nodal Protocol Revision Request (NPRR) 1108, ERCOT Shall Approve or Deny All Resource Planned Outage Requests, approved by the Public Utility Commission of Texas (PUCT) on May 12, 2022, requires Electric Reliability Council of Texas, Inc. (ERCOT) to calculate the maximum capacity of Resource Planned Outages that should be allowed on each day of the next 60 months pursuant to a methodology approved by the ERCOT Board of Directors (Board); and

WHEREAS, after due consideration of the alternatives, the Board of Directors (Board) of Electric Reliability Council of Texas, Inc. (ERCOT) deems it desirable and in the best interest of ERCOT to approve the *Methodology for Calculating Maximum Daily Resource Planned Outage Capacity*, as set forth in **Attachment A**, with an effective date of upon system implementation of NPRR1108;

THEREFORE, BE IT RESOLVED, that the *Methodology for Calculating Maximum Daily Resource Planned Outage Capacity* is hereby approved as set forth in **Attachment A**, with an effective date of upon system implementation of NPRR1108.

CORPORATE SECRETARY'S CERTIFICATE

I, Jonathan M. Levine, Assistant Corporate Secretary of ERCOT, do hereby certify that, at its June 21, 2022 meeting, the Board passed a motion approving the above Resolution by _____.

IN WITNESS WHEREOF, I have hereunto set my hand this ____ day of June, 2022.

Jonathan M. Levine
Assistant Corporate Secretary



Methodology for Calculating Maximum Daily Resource Planned Outage Capacity

Version _0.5

Document Revisions

Version	Description	Author(s)	Effective Date
0.5	Discussion draft pending PUC approval of NPRR1108, ERCOT shall approve or deny all resource outage requests, and associated Methodology for Calculating Maximum Daily Resource Planned Outage Capacity	ERCOT	

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1 PURPOSE

Paragraph (1) of Protocol Section 3.1.6.13, Maximum Daily Resource Planned Outage Capacity, requires ERCOT to calculate the maximum capacity of Resource Planned Outages that should be allowed on each day of the next 60 months. ERCOT must calculate the Maximum Daily Resource Planned Outage Capacity for days more than seven days ahead of the Operating Day and for days that are seven days or less prior to the Operating Day. Pursuant to Paragraph (3) of Section 3.16.13, which requires ERCOT to post the methodology used to calculate the Maximum Daily Resource Planned Outage Capacity on the ERCOT website, this document describes the details of methodology used in the calculation of these Maximum Daily Resource Planned Outage Capacity values. As further described herein, ERCOT establishes distinct Maximum Daily Resource Planned Outage Capacity values for Thermal Resources and for Intermittent Renewable Resources (IRR). As required by Paragraph (6) of Protocol Section 3.6.1, this methodology does not apply to outages of nuclear Generation Resources. This methodology also does not apply to certain outages of Generation Resources that are part of an industrial generation facility (IGF) if the owner of the facility has notified ERCOT of that status, as required by paragraph (7) of Section 3.1.6, and provided the information required by that paragraph in the Resource's Outage plan.

For each calendar year, ERCOT will review the current methodology and the calculated Maximum Daily Resource Planned Outage Capacity and report its findings to Technical Advisory Committee (TAC). The findings will include but not be limited to, the following:

- The aggregated hours of Resource Outages, including Planned Outages, Maintenance Outages, and Forced Outages in the preceding calendar year.
- Comparison of the calculated Maximum Daily Resource Planned Outage Capacity and the aggregated hours of thermal Resource Planned Outages in the preceding calendar year.

2 MAXIMUM DAILY RESOURCE PLANNED OUTAGE CAPACITY FOR DAYS MORE THAN SEVEN DAYS AHEAD OF THE OPERATING DAY

The Maximum Daily Resource Planned Outage Capacity for days more than seven days ahead of the Operating Day is calculated using seasonal assumptions, planned Resources that have met the criteria in Planning Guide Section 6.9, Addition of Proposed Generation to the Planning Models, and the long-term load forecast. The Maximum Daily Resource Planned Outage Capacity is calculated in 1-day time resolution.

2.1 Maximum Daily Resource Planned Outage Capacity for Thermal Generation Resources

Maximum Daily Resource Planned Outage Capacity for thermal Generation Resources = installed thermal Generation Resource seasonal capacity + peak average capacity of hydroelectric Generation Resources + Switchable Generation Resource (SWGR) capacity available to ERCOT + available mothballed capacity + capacity from private use network (PUN) + Direct Current (DC) Tie capacity + installed IRR capacity – targeted reserve capacity +

forecasted Demand reduction provided by price-responsive Demand –unplanned outage capacity for thermal Generation Resources – long term Load forecast + capacity of planned thermal Generation Resources + capacity of planned IRRs (1)

where:

- (+) installed thermal Generation Resource seasonal capacity is consistent with the calculation used in Protocol Section 3.2.6.2.2 for the applicable seasons, and excludes IRRs, Generation Resources in industrial generation facilities, ESRs, and DGR/DESRs
- (+) peak average capacity of hydroelectric Generation Resources is consistent with the calculation used in Protocol Section 3.2.6.2.2 for the applicable seasons
- (+) SWGR capacity available to ERCOT is consistent with the calculation used in Protocol Section 3.2.6.2.2 for the applicable seasons
- (+) available mothballed capacity is consistent with the calculation used in Protocol Section 3.2.6.2.2 for the applicable seasons
- (+) capacity from private use network (PUN) is consistent with the calculation used in Protocol Section 3.2.6.2.2 for the applicable seasons
- (+) DC Tie capacity is consistent with the calculation used in Protocol Section 3.2.6.2.2 for the application seasons
- (-) targeted reserve level is consistent with the Outage Adjustment Evaluation (OAE) in the Advance Action Notice (AAN) process described in Protocol Section 3.1.6.9
- (+) installed IRR capacity is determined based on the 10th percentile of hourly historical wind and solar output for the peak load hours of the same season for the previous three years
- (+) capacity of planned thermal Generation Resources is determined based on the thermal Generation Resources that meet the requirements of Planning Guide Section 6.9, the associated maximum sustainable capacity and the planned in-service date for each Resource identified in the unit registration process
- (+) capacity of planned IRRs is determined based on the installed capacity of those IRRs that meet Planning Guide Section 6.9, the planned in-service date for each IRR identified in the unit registration process, and the IRR's expected power production for the relevant season. The planned IRR capacity is calculated using the 10th percentile of the historical output per unit of installed IRR capacity. For example, if the total installed IRR capacity for a past season is 10,000 MW and the 10th percentile of the historical IRR output for the previous three years is 2,000MW, then the calculated planned IRR capacity for 1,000 MW of planned IRRs is $(1,000) * (2,000/10,000) = 200$ MW.
- (+) the forecasted Demand reduction provided by price-responsive Demand is consistent with the Outage Adjustment Evaluation (OAE) in the Advance Action Notice (AAN) process described in Protocol Section 3.1.6.9
- (-) unplanned outage capacity for thermal Generation Resources is calculated based on the 99th percentile of unplanned outages for the peak load hours of the same season in the preceding 3 years
- (-) long term Load forecast is determined for the study years based on the 50th percentile of the historical load profile, smoothed using a rolling 7-day average.

Historical Resource Planned Outages are also considered when determining the Maximum Daily Resource Planned Outage Capacity for thermal Generation Resources.

- The calculation of summer Maximum Daily Resource Planned Outage Capacity values for thermal Generation Resources described in equation 2.1 should not exceed 105% of the historical maximum Resource Planned Outage Capacity of thermal Generation Resources from the previous three summer seasons, and the calculation of the winter Maximum Daily Resource Planned Outage Capacity values for thermal Generation Resources should not exceed 105% of the historical maximum Resource Planned Outage Capacity of thermal Generation Resources from the previous three winter seasons. Summer months are June, July, and August; winter months are December, January, and February.

2.2 Maximum Daily Resource Planned Outage Capacity for Intermittent Renewable Resources (IRR)

Maximum Daily Resource Planned Outage Capacity for IRRs is calculated based on 105% of the historical maximum Resource Planned Outages for IRRs from the previous three years.

2.3 Resource Planned Outage Plan Review for Other Resources

2.3.1 Nuclear Generation Resources

In accordance with Protocol Section 3.1.6(6), ERCOT will approve Planned Outages for nuclear Generation Resources without regard to Outage capacity available within the Maximum Daily Resource Planned Outage Capacity.

2.3.2 Industrial generation facilities

In accordance with Protocol Section 3.1.6 (7), ERCOT will approve an Outage plan for a Generation Resource that is part of an IGF, even if the Outage would cause the outage capacity to exceed the Maximum Daily Resource Planned Outage Capacity, if the plan states that the Generation Resource is part of an IGF, as described in Utilities Code § 39.151(*I*), and that the Outage is necessitated by the operational needs of an industrial Load normally served by the Generation Resource. However, ERCOT will not approve the Outage plan if ERCOT determines the Outage will impair its ability to ensure transmission security.

2.3.3 Energy Storage Resources (ESR)

Currently, the capacity of Energy Storage Resources (ESRs) is assumed to be zero, consistent with Protocol Section 3.2.6.2.2, because nearly all ESRs are using their capacity to provide Ancillary Services rather than making that capacity available to meet system peak loads. Therefore, ERCOT does not intend to apply the Maximum Daily Resource Planned Outage Capacity in reviewing Planned Outage plans for ESRs. However, ESR Planned Outage plans are subject to transmission security assessment.

2.3.4 *Distributed Generation Resources (DGR), and Distributed Energy Storage Resources (DESR)*

The capacity contribution of DGRs and DESRs to meet system peak load is assumed to be zero. Therefore, ERCOT does not intend to apply the Maximum Daily Resource Planned Outage Capacity in reviewing DGR and DESR Planned Outage plans. However, Planned Outage plans for DGRs and DESRs are subject to transmission security assessment.

3 **MAXIMUM DAILY RESOURCE PLANNED OUTAGE CAPACITY FOR SEVEN DAYS OR LESS PRIOR TO OPERATING DAY**

The Maximum Daily Resource Planned Outage Capacity is calculated to be consistent with the inputs used for an Outage Adjustment Evaluation (OAE) as described in Protocol Section 3.1.6.9.

3.1 **Maximum Daily Resource Planned Outage Capacity for Thermal Generation Resources**

Maximum Daily Resource Planned Outage Capacity for thermal Generation Resources = seasonal maximum capacity of Generation Resources for non-IRR and non-PUN + wind forecast + solar forecast + capacity from private use network + DC Tie capacity – unplanned outaged capacity of thermal Generation Resources – Load forecast – targeted reserve levels + the forecasted Demand reduction provided by price-responsive Demand + SODG and SOTG forecasts (2)

where:

- (+) the seasonal maximum capacity of Generation Resource is computed by adding the seasonal net maximum capacity of the Generation Resource, as reported in its RARF, except for IRRs, private use network Generation Resources, ESRs, and DGRs/DESRs.
- (+) the selected Wind-powered Generation Resource Production Potential (WGRPP)
- (+) the selected PhotoVoltaic Generation Resource Production Potential (PVGRPP)
- (+) capacity from Generation Resources in the PUNs is consistent with calculation used in Protocol Section 3.2.6.2.2 for the applicable seasons
- (-) approved or accepted unplanned outage capacity as reported in the Outage Scheduler excluding IRRs, private use network Generation Resources, ESRs, and DGRs/DESRs
- (+) DC Tie capacity is consistent with the calculation used in Protocol Section 3.2.6.2.2 for the applicable seasons
- (-) the selected Load forecast
- (-) targeted reserve levels
- (+) forecasted Demand reduction provided by price-responsive Demand
- (+) SODG and SOTG forecast when available

3.2 Maximum Daily Resource Planned Outage Capacity for Intermittent Renewable Resources (IRR)

The Maximum Daily Resource Planned Outage Capacity for IRRs is determined based on 105% of the historical maximum Resource Planned Outages for IRRs from the previous three years.

3.3 Resource Planned Outage Request Review for Other Resources

3.3.1 Nuclear Generation Resource

In accordance with Protocol Section 3.1.6 (6), ERCOT will approve Planned Outages for nuclear Generation Resources without regard to Outage capacity available within the Maximum Daily Resource Planned Outage Capacity.

3.3.2 Industrial generation facilities

In accordance with Protocol Section 3.1.6 (7), ERCOT will approve an Outage plan for a Generation Resource that is part of an IGF, even if the Outage would cause the outage capacity to exceed the Maximum Daily Resource Planned Outage Capacity, if the plan states that the Generation Resource is part of an IGF, as described in Utilities Code § 39.151(l), and that the Outage is necessitated by the operational needs of an industrial Load normally served by the Generation Resource. However, ERCOT will not approve the Outage plan if ERCOT determines the Outage will impair its ability to ensure transmission security.

3.3.3 Energy Storage Resources (ESR)

Currently, the capacity of Energy Storage Resources (ESRs) is assumed to be zero, consistent with Protocol Section 3.2.6.2.2, because nearly all ESRs are using their capacity to provide Ancillary Services rather than making that capacity available to meet system peak loads. Therefore, ERCOT does not intend to apply the Maximum Daily Resource Planned Outage Capacity in reviewing Planned Outage plans for ESRs. However, ESR Planned Outage plans are subject to transmission security assessment.

3.3.4 Distributed Generation Resources (DGR), and Distributed Energy Storage Resources (DESR)

The capacity contribution of DGRs and DESRs to meet system peak load is assumed to be zero. Therefore, ERCOT does not intend to apply the Maximum Daily Resource Planned Outage Capacity in reviewing DGR and DESR Planned Outage plans. However, Planned Outage plans for DGRs and DESRs are subject to transmission security assessment.