|  |  |  |  |
| --- | --- | --- | --- |
| PGRR Number | [109](https://www.ercot.com/mktrules/issues/PGRR109) | PGRR Title | Dynamic Model Review Process Improvement for Inverter-Based Resource (IBR) Modification |
| Date Submitted | October 4, 2023 |

|  |
| --- |
| Submitter’s Information |
| Name | Doug Pietrucha |
| E-mail Address | dpietrucha@texasadvancedenergy.org  |
| Company | Texas Advanced Energy Business Alliance |
| Phone Number | 202-380-1950 ext. 303 |
| Cell Number |   |
| Market Segment | Not Applicable |
|  |  |

|  |
| --- |
| Comments |

Operational predictability of Resources is paramount to grid stability, and modifications to the operating conditions of a Resource must be adequately accounted for. TAEBA is supportive of ERCOT’s proposed rule change with modification. It is also notable that other grid operators, such as PJM[[1]](#footnote-1) and SPP[[2]](#footnote-2), require this type of modeling for as-built systems. While ERCOT is right to seek the tools it believes it needs to assess Resource behavior, TAEBA has the following concerns with this PGRR as proposed:

* ERCOT’s proposed response time of 10 business days following the Interconnecting Entity’s (IE) submission of its dynamic models seems protracted; five business days would be more appropriate. The preparation of the as-built model is the responsibility of the IE, ERCOT Staff are simply reviewing their inputs to determine if the as-built system will operate closely enough to the original system plan to maintain reliability. If additional time is needed, ERCOT has already proposed the option to extend model reviews.
* As written, PGRR109 would allow ERCOT to extend the review process to 20 Business Days without any guidelines on what issues encountered during model evaluation would justify an extension of the review.
* Ambiguity persists regarding what constitutes a “modification to settings or equipment associated with Inverter-Based Resources (IBRs) that affects electrical performance and requires dynamic model updates” regarding changes to IBR operation modifications. This may make compliance with the rule changes difficult.
* The timeline in which a Transmission Service Provider (TSP) must conduct a dynamic stability study when reviewing system changes should be shortened from 90 days to 30 days which we believe is more reasonable.
* TAEBA is supportive of ERCOT Staff’s inclusion of the new paragraph (4)(a)(vii) of Section 5.5, allowing generators to operate under new system characteristics temporarily with approval from ERCOT and the TSP.

Generally, TAEBA encourages ERCOT to consolidate requirements for IEs for simple, single-step verification. Many of our member companies have invested significantly in ERCOT in part because of the relative ease of interconnection when compared to other ISOs. ERCOT and Texas benefit from this business investment; lengthening interconnection times with redundant checks of Resource operational characteristics would be a disadvantage to our members as well as Texas consumers due to higher prices as Resources face more time required to assess their Point of Interconnection (POI), submit reports and models, and possibly wait on the TSP to return its findings to ERCOT. For new interconnections, the process should be condensed given the relative predictability of how new, unmodified equipment behaves relative to its operating assumptions from the manufacturer.

|  |
| --- |
| Revised Cover Page Language |

None

|  |
| --- |
| Revised Proposed Guide Language |

5.2 General Provisions

***5.2.1 Applicability***

(1) The requirements in Section 5, Generator Interconnection or Modification, apply to the following:

(a) Any Entity proposing to interconnect any generator with an aggregate nameplate capacity of one MW or greater, including but not limited to any Generation Resource or Energy Storage Resource (ESR), to the ERCOT System;

(b) Any Entity proposing to interconnect a Settlement Only Generator (SOG) to the ERCOT System; or

(c) Any Resource Entity seeking to modify a Generation Resource, ESR, or SOG that is connected to the ERCOT System by:

(i) Increasing the real power rating from that shown in the latest Resource Registration data by one MW or greater within a single year;

(ii) Changing the inverter, turbine, generator, or power converter associated with a facility with an aggregate real power rating of ten MW or greater, unless the replacement is in-kind;

(iii) Changing any settings or equipment associated with Inverter-Based Resources (IBRs) in a manner that is deemed to require further study in accordance with the process outlined in paragraph (4) of Section 5.5, Generator Commissioning and Continuing Operations;

(iv) Changing or adding a Point of Interconnection (POI) to a facility with an aggregate real power rating of ten MW or greater; or

(v) Increasing the aggregate nameplate capacity of a generator less than ten MW to ten MW or greater.

(2) For the purposes of Section 5, the term “generator” includes but is not limited to a Generation Resource, SOG, and ESR.

(3) For the purposes of determining the appropriate requirements in Section 5, a generator is considered a “large generator” if it currently has or is proposed to have an aggregate nameplate capacity of ten MW or greater. A generator is considered a “small generator” if it currently has or is proposed to have an aggregate nameplate capacity of less than ten MW.

(4) Notwithstanding paragraph (3), above, if a Resource Entity is proposing to increase the real power rating of an existing generator by one MW or greater but less than ten MW, that generator shall be considered a small generator for the purposes of the interconnection process described in Section 5.

(5) Notwithstanding paragraphs (3) and (4), above, if a Resource Entity is proposing to increase a generator’s real power rating by ten MW or more, or is proposing to increase a generator’s real power rating from less than ten MW to ten MW or more, that generator shall be considered a large generator for the purposes of the interconnection process described in Section 5.

(6) For the purposes of determining the appropriate requirements in Section 5, ERCOT may require two or more separate generator interconnection requests to the same substation to follow the interconnection process applicable to the large generators, if, following the proposed change, those generators would have an aggregate nameplate capacity of ten MW or greater, and the projects are proposed by the same Entity or Affiliates.

(7) For a new or modified generator that has been designated as a Self-Limiting Facility or as a component of a Self-Limiting Facility, the categorization of the generator as a small generator or large generator pursuant to paragraphs (3) through (5) above shall be determined using the Self-Limiting Facility’s established limit on the total MW Injection, or if applicable, the proposed increase in that value instead of the nameplate capacity of the Self-Limiting Facility.

5.5 Generator Commissioning and Continuing Operations

(1) Each Interconnecting Entity (IE) shall meet the conditions established by ERCOT before proceeding to Initial Energization, Initial Synchronization, and commercial operations. These conditions may require proof of meeting applicable ERCOT requirements, which may include, but are not limited to, reactive capability, voltage ride-through standards, dynamic model template submission, Automatic Voltage Regulator (AVR), Primary Frequency Response (PFR), Power System Stabilizer (PSS), Subsynchronous Resonance (SSR) models, and telemetry.

(2) Prior to the Resource Commissioning Date of an IBR, the IE associated with the IBR shall submit the appropriate dynamic models for the “as-built” data and the data submitted for the quarterly stability assessment, documentation clearly indicating any differences, results of the model quality tests of the “as-built” data overlaid with the results of the data submitted for the quarterly stability assessment, and associated simulation files pursuant to paragraph (5)(c) of Section 6.2, Dynamics Model Development. Submissions shall be sent electronically to Dynamicmodels@ercot.com for ERCOT review, and the phrase "IBR prior to commissioning" must be included in the subject line of the submission email. ERCOT shall respond to the IE within five Business Days of the submission, indicating whether the submission is acceptable or if additional information is required. If additional time is needed for review, ERCOT can extend this review period by an additional 20 Business Days, and an email will be sent to notify the IE that it needs additional time to review the submission. This extension may only be used in cases where the submitted as-built dynamic modeling shows greater than a 5% variation in maximum MW output than the model of the original planned system.

(3) No later than 30 days following the Resource Commissioning Date, the IE shall submit updates to the resource dynamic planning and operations models through the online Resource Integration and Ongoing Operations (RIOO) system based on “as-built” data and provide a plant verification report as required by paragraph (5)(b) of Section 6.2. Pursuant to paragraph (5)(c) of Section 6.2, the IE shall include model updates with model quality tests.

(4) During continuing operations:

(a) Prior to the implementation of any modification to settings or equipment associated with IBRs that affects electrical performance and requires dynamic model updates, the proposed modification shall be reviewed by the interconnecting Transmission Service Provider (TSP) and ERCOT;

(i) The Resource Entity shall submit the appropriate dynamic model for the proposed modification, results of the model quality tests overlaid with the results before the modification, and associated simulation files pursuant to paragraph (5)(c) of Section 6.2. Submissions shall be sent electronically to Dynamicmodels@ercot.com for ERCOT review, and the phrase "IBR proposed modification" must be included in the subject line of the submission email. The Resource Entity may withdraw its modification plan at any time during the review process if the Resource Entity no longer wishes to proceed with the modification.

(ii) ERCOT shall respond to the Resource Entity within five Business Days of the submission in paragraph (i) above, indicating whether the submission is acceptable or if additional information is required. ERCOT can extend this review period by an additional 20 Business Days, and an email will be sent to notify the Resource Entity that it needs additional time to review the submission. This extension may only be used in cases where the submitted as-built dynamic modeling shows greater than a 5% variation in maximum MW output than the model of the original planned system.

(iii) Upon completing its review of the model quality tests, ERCOT shall notify the Resource Entity and the interconnecting TSP of its determination. The notification will indicate one of the following:

1. ERCOT recommends that the interconnecting TSP conduct a limited dynamic stability study comparing electrical performance before and after the proposed modification, and reasonably evaluate whether the proposed modification may present dynamic stability risks that should be subject to further study.
2. The proposed modification is applicable to paragraph (1)(c)(iii) of

Section 5.2.1, Applicability. The Resource Entity shall initiate a Generator Interconnection or Modification (GIM) request through RIOO.

1. The proposed modification is deemed unacceptable.
2. The proposed modification is deemed acceptable without need for a dynamic stability study.

(iv) Within 30 days of the receipt of the accepted submission in paragraph (iii)(A) above, the interconnecting TSP shall submit its dynamic stability study report to ERCOT electronically to Dynamicmodels@ercot.com.

(v) ERCOT shall review the dynamic stability study report submitted by the interconnecting TSP within five Business Days.  ERCOT can extend this review period by an additional 20 Business days, and an email will be sent to notify the interconnecting TSP and the Resource Entity that it needs additional time to review the dynamic stability study report. This extension may only be used in cases where the submitted as-built dynamic modeling shows greater than a 5% variation in maximum MW output than the model of the original planned system.

(vi) Upon completing its review and ERCOT acceptance of the dynamic stability study report, ERCOT shall notify the Resource Entity and the interconnecting TSP of its determination. The notification will indicate one of the following:

1. The proposed modification is deemed acceptable.
2. The proposed modification is applicable to paragraph (1)(c)(iii) of Section 5.2.1. The Resource Entity shall initiate a GIM request through RIOO.

(vii) ERCOT, in consultation with the interconnecting TSP, may allow the proposed changes to be temporarily implemented prior to the completion of the above review process in order to address any identified performance deficiency.

(b) Pursuant to paragraph (5)(c) of Section 6.2, the Resource Entity shall include model updates with model quality tests.

(c) The Resource Entity shall provide ERCOT with a plant verification report as required by paragraph (5)(b) of Section 6.2 at the following times:

(i) No later than 30 days after implementing a settings change as required by paragraph (7) of Section 6.2;

(ii) No earlier than 12 months and no later than 24 months following the later of the Resource Commissioning Date or March 1, 2021; and

(iii) A minimum of every ten years.

1. PJM Manual 14C, 2023. https://www.pjm.com/~/media/documents/manuals/m14c.ashx [↑](#footnote-ref-1)
2. Southwest Power Pool Open Access Transmission Tariff, Sixth Revised Volume No. 1. https://spp.etariff.biz:8443/ViewerDocLibrary/MasterTariffs//5FullTariff.pdf [↑](#footnote-ref-2)