



**Limited Dynamic Stability Study for Inverter-Based  
Resources (IBR) Model Changes  
Study Scope Guideline**

**February 2024**

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| August 22, 2023   | 1.0            | Original draft   | ERCOT System Planning |
| February 22, 2024 | 1.1            | Minor edit, note "significant contingency."<br>Finalized by DWG. | ERCOT System Planning |

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# Limited Dynamic Stability Study for IBR Model Changes

## 1 Purpose

The purpose this document is to serve as a guideline to establish a study scope for the limited stability study referenced in Section 5.5(4)(a)(iii)(A) of ERCOT Planning Guides (following PGRR-109 approval). Per paragraph (4)(a), the limited stability study will be performed prior to implementation of an IBR settings or equipment change that impacts the dynamic model performance, to determine whether the change needs further study through the Generator Interconnection or Modification process.

## 2 Limited Stability Study

### 2.1 Base Case

Transmission Service Providers (TSPs) should select case(s) per engineering judgement, typically a high renewable dispatch case.

### 2.2 Study Event

At minimum, the study should consider a three-phase fault applied at the resource Point of Interconnection (POI). TSPs may run either a 9-cycle fault or run a 3-phase fault that matches the typical breaker clearing time in the area. If running a 9-cycle fault, testing of contingencies (e.g., branch tripping) is not required but may be helpful to assess stability impacts. If running a typical breaker clearing time fault, then test at least one branch contingency that is, by TSP experience or engineering judgement, a significant contingency for the plant.

TSPs may assess additional scenarios or contingencies as deemed appropriate for the change and facility.

### 2.3 Methodology

The study should compare the system response under the new (post-modification) model against the system response under the previous (pre-modification) model in a PSS/e system simulation to assess impact. The study should plot relevant variables such as voltage and voltage angle, plant real and reactive power, and nearby machine rotor angle pre and post side-by-side or overlaid for easy comparison to illustrate whether the model change impacts performance and whether the performance is negatively impacted.

### 3 Deliverables

A brief write-up describing case used, procedure, any special considerations, and showing result plots pre- and post-modification and result discussion and conclusion should be submitted electronically to [dynamicmodels@ercot.com](mailto:dynamicmodels@ercot.com) with email subject line:

**[Limited Stability] Resource XYZ** (with XYZ replaced by the Resource name)

The report (or zip file package, if emailed in zip file format) should include attachments of the model pre- and post-modification (.dvr files and/or Excel .xlsm Template files) and non-converted power flow case file used.

Final determination of acceptability of the proposed change will be subject to ERCOT's review.