



# Transient Security Assessment Tool (TSAT) Data Requirement Update

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# RRGRR021 TSAT Requirement

- Effective August 1, 2020, Resource Entities for all existing and new Generation Resource or Settlement Only Generator (SOG), including a storage device are required to submit TSAT dynamic models for the ERCOT operations model
- Resource Entities with IRRs that have PSSE user-defined models are required to review these models and submit TSAT user-defined dynamic models
- TSPs are required to review the PSSE user-defined models for existing transmission equipment (dynamic reactive devices etc.) and submit TSAT user-defined dynamic models

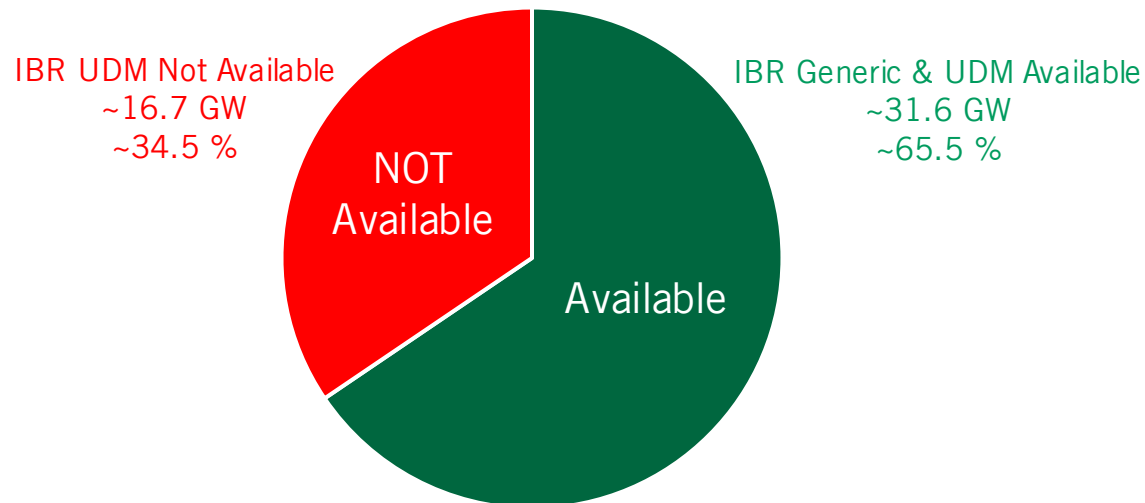
# TSAT User-Defined models

- Generation Resources or SOGs, including a storage device that have provided a user-defined planning model (in PSSE) are required to provide the same user-defined model for TSAT operations model
- Generic TSAT models are **NOT acceptable** where GRs have submitted user-defined models for planning model (PSSE)
- Both planning (PSSE) and operations (TSAT) user-defined model should use (read) the same dynamic model parameters (dynamic data format dyr file)

# Real-time TSAT – Model Deficiencies (as of 2021 Q4 QSA)

- Models for Inverter-Based Resources (wind, solar, battery) often use user-defined code (those user-defined models submitted for PSSE)
  - Generic equivalent representations in TSAT are not suitable for ERCOT regions with low system strength
  - Total Inverter-Based Resources (IBR) capacity ~ 48.3 GW

IBR Model Availability in TSAT



# ERCOT PSSE user-defined models (as of 2021 Q4 QSA)

PSSE User-defined Models (UDM)	Capacity (GW) (Total IBR UDM = ~29.1 GW)	% of Total IBR UDM
GEWTG2, SWTGU1, VWCOR6, SWTGU2, GXX043, M24G1, CP17093300, A1530U1	16.82	57.8
VC18084500, VC18084700, GMD041308, GELV5G1, A1530T, PEGEN_H1001A, AWWTG_100, A1530U2, GSCORE	4.34	14.9
AWWTG_102,AWWTG_103,AWWTG_105,AWWTG_201,BP1000IN,CIMTSCT,CP17083200,CP18084500,CP18104500,CP200651001,CP200652300,ECTSPV,GD0810,GD0811,GEPVG,GEWTA0705,GEWTA2,GMD0201,GMD0352,GMD0353,GMD041302,GSCOR1,GWPM34,GWPM41,KNEXP1,NXK8BJ,NXK8CE,PECON_HM1008,PEGEN_H1005D,PEGEN_H1006,PEGEN_HM1008,SVSMO3U2,SWTEU2,VC18084911,VC19065401,VC200451001,VS17073200,VS17074600,VS17074902,VS3102,VWCOR7,VWCOR8	7.94	27.3

# ERCOT TSAT UDMs Received (as of Sep 27, 2021)

PSSE and TSAT Gen User-defined Model (UDM)
PEGEN_HM1008
GEWTG2
GMD041308
CP200652300
GEWTA0705
VC200451001
CP200651001
BESTES137_1
CP20065718
CP20065800

- ERCOT has a total of around 262 units that have user-defined models in the planning model (PSSE)
- Around 115 units have submitted TSAT UDMs. Models received are being validated.
- Some have submitted a generic model as a substitute for a user-defined model. This is not acceptable.
- No TSAT model submission is needed if using generic models or “GEWTG2”

# TSAT user-defined model development update

Major Vendor	PSSE User-defined Models (UDM)	TSAT UDM Status (as of Sep 27, 2021)
Acciona (Nordex)	6 different generator models	No TSAT UDM available
Nordex	2 generator models	
AMSC	2 STATCOM models	No update is available.
Bonus (Siemens)	1 generator model	1 model provided. No update on the rest.
Gamesa (Siemens)	8 generator models	
Siemens	3 generator models	
GE	5 generator models	2 models provided. No update on the rest.
Goldwind	2 generator models	No update is available.
Kaco	1 generator model	No update is available.
Mitsubishi	1 generator model	No update is available.
Power Electronics	3 generator models	1 model provided. No update on the rest.
SMA	1 generator model	No update is available.
Vestas	15 generator models	5 models provided. No update on the rest.

## RRGRR021 Timeline

- ERCOT announced at the March 4, 2021, ROS meeting that it would refrain from reporting non-compliance with the TSAT model submission requirement to the Public Utility Commission until November 1, 2021.
- On October 1, 2021, ERCOT has sent an email to each impacted RE and provided the status with respect to their Generation Resource(s) and/or SOG(s) for TSAT model requirement.
- After November 1, 2021, ERCOT will be reporting non-compliance with the RRGRR021 TSAT model submission requirement to the Public Utility Commission.



Questions?