



Section 10 of BPM for TPP- Generator modeling webinar

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Presentation overview

- Overview of PRR 1207 & Section 10
- Generator category list
- Generator data template
- EMT model submission
- Quality deficiencies
- Submission process
- Helpful links

Overview of PRR 1207 and Section 10 of BPM for TPP

- Section 10 sets the categorization of generating units, applicable technical and data requirements, deadline for data submission, submission process, and applicable penalties for non-compliance
- Data submission is the responsibility of the participating generator owner, i.e. the entity holding the Participating Generating Agreement for the Resource ID
- PRR 1207 allows for generators to request a deadline extension for submission of Electromagnetic Transient (EMT) models in Power Systems Computer Aided Design (PSCAD), and defines the process for generators to apply for such an extension from CAISO and PTOs

Generator Data Template

- The generator data template will be transmitted along with the data request letter sent to the generator owner.
- Generator data templates have been posted on the CAISO website, with link provided later in the presentation
- The CAISO will walk participants through a sample generator data template to provide guidance on filling out the template as per instructions

EMT model submission

- Due to the shift in resource mix (e.g. higher penetrations of inverter-based generation), operating characteristics and constraints of the power system are changing. EMT studies must be performed to assure continued reliability.
- The CAISO and PTOs have jointly developed and posted guidelines for developing and submitting EMT models, both for synchronous and asynchronous generators

<http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=95422303-C0DD-43DF-9470-5492167A5EC5>

- If OEMs require execution of NDAs for provision of such models to CAISO and PTOs, the generator should contact CAISO as soon as possible
- CAISO will publish a list of generators required to submit EMT models, in February 2020

EMT Applicability Criteria

- Generation facilities electrically close to series compensated line(s), are required to provide EMT models
- Facilities which utilize legacy Type 1 and Type 2 wind turbines are exempt from the EMT modeling requirement
- The remaining EMT slides are only intended to highlight major requirements. EMT models must comply with full requirements described in the documents posted on the CAISO website

EMT Modeling Requirements: Synchronous & Induction Generators

- EMT models of synchronous generators and induction generators should:
 - Include the Multi-Mass Torsional Shaft Interface model
 - Include representation of the machine saturation or magnetizing curve, and the transformer magnetizing curves
 - Represent excitation system, governor, and/or power system stabilizer as a user-written PSCAD model or as standard PSCAD block models
 - Represent generator grounding and protection system

EMT Modeling Requirements: Inverter-Based Generators

- EMT models of inverter-based generators should:
 - Include the full detailed inner control loops of the power electronics. Representation should include all fast inner controls, as implemented in the installed equipment.
 - Represent all plant level controllers
 - Represent generator protection system
 - Represent dynamic reactive devices and pertinent electrical and mechanical configurations

FAQs

- Generators are not required to provide PTO facility data
- If OEM data not available, use performance testing to modify generic WECC models for facility type
- For new commercial operation date (COD) generators required to submit test reports- provide as-built PSLF models and equipment data even if test reports are not available
- Protection settings to be provided even if corresponding dynamic models are not available in WECC library

Data Request Process-Existing Generators

- CAISO will send a letter to the generator owner with a cc to the appropriate SC, 6-8 months in advance of the required data submission deadline, providing data submission instructions
- There will be a generator data request template attached, pre-populated with data on record with the CAISO and PTO, along with existing models files
- Letter will contain instructions for generator owner to validate the existing data and meet the submission requirements set in the generator data request template

Data Request Process-New Generators

- CAISO will send a letter to the generator owner with a cc to the appropriate SC, after the generator has achieved COD, providing data submission instructions
- New COD generators have up to 365 CD from request date to provide test reports. All other data requested in the letter need to be submitted within 120 CD from the request date

Generator Category List

- The generator category list is a spreadsheet mapping each resource ID to: 1) Category of data submission, and 2) Phase of data submission
- Generator owners should use the generator category list to identify the appropriate category and phase for their generator
- Data requirements and submission deadline will be as described in section 10 of the BPM for TPP, and the attached generator data request template sent by the CAISO

Generator Category Overview

Category	Nameplate capacity	Voltage
Category 1	Individual: ≥ 20 MVA Aggregate: ≥ 75 MVA	≥ 100 kV
Category 2	Individual: ≥ 10 MVA Aggregate: ≥ 20 MVA	≥ 60 kV
Category 3	Individual: < 10 MVA Aggregate: < 20 MVA	≥ 60 kV
Category 4	Explicitly modeled in basecase	< 60 kV
Category 5	Modeled as aggregate resource in basecase	

Submission Process

- Generator owner will email the completed generator data request template and the associated supplemental documents, to the email addresses identified in the data request letter
- The subject line format for the email has been provided in Section 10.4.1 of the BPM for TPP
- The CAISO will provide a sample email submission at the webinar
- On submitting the data request email response, the generator owner will receive a confirmation of receipt with 10 calendar days from submission

Submission format- sample submission to PG&E

Email subject line:

BLPARA_5_SOLAR_Blue Paradise Solar Farm_ BPM model submission

Recipient:

GridModelingData@caiso.com

GenModel@pge.com < replace email id with appropriate PTO >

Attachments:

Updated generator data request template

Test reports (as required)

Other identified documentation

Issues considered not a submission deficiency(quality deficiency)

- Generator owners will notice that certain deficiencies are identified as “not a submission deficiency” or “quality deficiency”. These deficiencies will not result in penalties under the CAISO tariff, but will require resolution
- These deficiencies primarily fall in following categories: deviation from interconnection requirements, NERC or WECC standards, and model performance issues
- Please contact the CAISO and PTO for any questions on these deficiencies

Determination of Data Submission Compliance

To summarize: Incomplete or inconsistent data submissions will lead to deficiencies and non-compliance

Following factors listed in BPM for determination of data submission compliance:

- Completed generator data template as per instructions provided in “Instructions” tab;
- All supplemental data documents requested;
- Show .epc and .dyd files initialize in PSLF program (provide snapshot of initialization); and
- Spread of real power output (P_g) and reactive power output (Q_g) in GE-PSLF simulation results for a 10 second no-fault run at full real power output should be less than 1 or 1% (provide in table format).
- Data submission is made as outlined in Section 10.4.1 of the BPM for TPP

Validation and Cure Period

- Once a valid submission from a generator owner has been received, the CAISO and PTO will review the data and identify any deficiencies, usually within 90 CD from date of submission
- The CAISO will send a list of deficiencies to the generator owner, which need to be cured within 60 CD from the date of such request
- If the generator owner fails to cure the deficiencies identified, it may lead to penalties under CAISO Tariff Section 37.6.2

Helpful links

- BPM for TPP

<https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Transmission%20Planning%20Process>

- Generator category list, Generator data request template, and other reference documents-listed under CAISO webpage section (Transmission Planning → Transmission Planning Documents → Submittal requirements- data for power system modeling and analysis (TPP) BPM)

<http://www.caiso.com/planning/Pages/TransmissionPlanning/Default.aspx>

- Please submit questions to gridmodelingdata@caiso.com with "BPM model submission" in the subject line.

Helpful Links-cont'd

- E-mail mailbox addresses for CAISO and PTOs

CAISO: GridModelingData@caiso.com

PG&E: GenModel@pge.com

SCE: basecase@sce.com

SDG&E: basecase@semprautilities.com

VEA: veaengineering@vea.coop

Gridliance: GLW-planning@gridliance.com