



California ISO

TECHNICAL BULLETIN

California ISO Qualified Change Definition

FAC-002-4 R6

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Revision History

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Executive Summary

This technical bulletin sets forth the California Independent System Operator's (ISO) definition of qualified change as it relates to FAC-002-4 Facility Interconnection Studies. This technical bulletin will be posted on the Transmission Planning page of the ISO website and serves as compliance with FAC-002-4 R6 which states "Each Planning Coordinator shall maintain a publicly available definition of qualified change for the purposes of facility interconnection."

The California ISO is registered as a Planning Coordinator (PC) and therefore is required to publicly post the definition in accordance with requirement R6. This technical bulletin is applicable to all facilities located within the ISO planning coordinator area as described in the Technical Bulletin "California ISO Planning Coordinator Area Definition"¹ and non-ISO control area entities for which the ISO performs the PC function.

Background

FAC-002-3² R1 states "Each Transmission Planner and each Planning Coordinator shall study the reliability impact of: (i) interconnecting new generation, transmission, or electricity end-user Facilities and (ii) materially modifying existing interconnections of generation, transmission, or electricity end-user Facilities." This version of the standard ceases to be in effect on December 31, 2023 and FAC-002-4 becomes mandatory and enforceable on January 1, 2024.

As described in NERC's Implementation Guidance for FAC-002-4³, "The standard (FAC-002-3) implied that the term "materially modified" should be used to distinguish between facility changes that are required to be studied and those that need not be studied. The standard did not specify whether the Transmission Planner or Planning Coordinator was responsible for determining what is considered a material modification. Additionally, in FERC-jurisdictional areas, the term 'Material Modification' means 'those modifications that have a material impact on the cost or timing of any interconnection Request with a later queue priority date.' This has led to widespread confusion across

¹ <http://www.caiso.com/Documents/TechnicalBulletin-CAISOPlanningCoordinatorDefinition.pdf>

² <https://www.nerc.com/pa/Stand/Reliability%20Standards/FAC-002-3.pdf>

³

https://www.nerc.com/pa/Stand/Project_202005_Modifications_to_FAC001_and_FAC002_/Implementation%20Guidance%20for%20FAC-002-4%20Requirement%20R6.pdf

the industry regarding the correct application of these terms related to the FERC Open Access Transmission Tariff (OATT) and the NERC Reliability Standards requirements.”

The new version of the standard (FAC-002-4⁴) has the following updates:

- Replaces the term “materially modified” with the term “qualified change”
- Specifies that the PC is responsible for determining what is a qualified change
- Adds a requirement (R6) that the PC post a publicly available definition of “qualified change”

Qualified Changes

The following sections describe the ISOs definition of qualified change as it relates to existing interconnections of transmission, generation, or end-user Facilities. The tables in each section list categories and examples of qualified changes for existing interconnections of transmission, generation, and end-user Facilities that have been based on information found in NERC’s FAC-002-4 Implementation Guidance⁵. These tables are not intended to be an exhaustive list and entities are encouraged to reach out to the ISO or their PTO, as applicable, with any questions regarding applicability.

Existing Interconnections of Transmission

Qualified changes for existing interconnection of transmission include any interconnection within the ISO control area that connects more than one Participating Transmission Owner (PTO). This includes projects related to competitive solicitation as well as merchant facilities. PTOs submit these changes to the ISO as part of the Transmission Planning Process (TPP).

Table 1: Qualified Changes to Existing Interconnections of Transmission	
Category	Examples
Change in Rating	Change in the facility thermal rating by greater than 5% Change in the facility impedance by greater than 5% Change in facility voltage class
Change in Protection Coordination	Change in the protection coordination that would alter the way a facility would switch
Change in topology	Change in topology that would alter power flows on the BES

⁴ <https://www.nerc.com/pa/Stand/Reliability%20Standards/FAC-002-4.pdf>

⁵

https://www.nerc.com/pa/Stand/Project_202005_Modifications_to_FAC001_and_FAC002_Implementation%20Guidance%20for%20FAC-002-4%20Requirement%20R6.pdf

Existing Generation

Qualified changes to existing generation consist of any technical changes that could impact the ISO controlled grid. These proposed changes should follow the Post-COD Modification Request process found in Section 6.1.6 of the CAISO Generator Management BPM⁶ utilizing the Modification Request Form.

For entities that the ISO serves as contractual PC but are not part of the ISO controlled grid, please submit any qualified changes to existing generation to your PTO and RegionalTransmission@caiso.com.

Table 2: Qualified Changes for Generation	
Category	Examples from NERC Implementation Guidance
Change in Generator Output	<p>Change that affects its Seasonal Real Power or Reactive Power capability by more than 10 percent of the last reported and/or verified capability and change is expected to last more than six months.</p> <p>Change in power factor capability of the generator</p>
Change of GSU	<p>Change of GSU that results in any of the following differences:</p> <ul style="list-style-type: none"> • Reduction in rating by more than 10% • Impedance change by more than 10% <ul style="list-style-type: none"> o Change in transformer losses o Change in transformer saturation differences
Change in Generator Characteristics	<p>Change in the inertia of the Generator by more than 10% (synchronous generators only)</p> <p>Change in steady state transient and sub-transient reactance of the Generator or generator Interconnection Facilities by more than 10% (synchronous or induction generators only)</p> <p>Transmission Planner requested Generator facility projects in MOD 027 or MOD-026 resulting in changes that alter the equipment response characteristic.</p> <p>Changes to a generator's electromagnetic transient models</p> <p>Change of 5% or more of the plant to an alternate production profile</p>

⁶ <https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Generator%20Management>

Table 2: Qualified Changes for Generation	
Category	Examples from NERC Implementation Guidance
Change in Protection System of the generator facilities or generator interconnection facilities	Changes in relay settings as required in PRC-024 R3 to report changes or limitations to Transmission Planner and Planning Coordinator within 30 days. <ul style="list-style-type: none"> • include high and low frequency settings along with delay times if applicable • include high and low voltage settings along with delay times if applicable
Inverter Based Resource (IBR) Only: Change in Inverter or inverter settings or to the Power Plant Controllers	Change of 10% or more of the inverter-based resource units at a facility that is not replacement in-kind Adding 5% or more battery energy capacity Change to any Power Plant Controller setting or firmware resulting in a difference in: <ul style="list-style-type: none"> • frequency or voltage support of the IBR • a difference in when the IBR discontinues current injection to the GRID (i.e. blocking commands)
Unplanned change in governor or governor settings	Uncharacteristic changes that result in how the generator responds to grid frequency deviations and is expected to last more than six months.
Unplanned change in exciter or exciter settings	Uncharacteristic changes that result in how the generator responds to grid voltage deviations and is expected to last more than six months
Change in power system stabilizer	Addition or removal of power system stabilizer Setting changes of power system stabilizer

Existing End-User Facilities

Qualified changes for existing end-user Facilities encompass all load interconnections from Distribution Providers to Transmission Owners/Transmission Planners. The PTO provides this information to the ISO as part of the TPP. Any updates made outside the TPP will need to be provided to the ISO and evaluated and/or incorporated as needed.

Table 3: Qualified Changes to End-User Facilities (Load)	
Category	Examples from NERC Implementation Guidance
Increase in Demand	Annual increase in Demand exceeding 10% Increase in Demand of 75 MW or greater within the next two years; or Increase in Demand of 20 MW or greater within the next two years for a third-party Facility interconnected to a Generator Owner's Facility
Addition of equipment that would significantly impact the composite load model used to represent a Facility	Installation of a motor 1,000 hp or larger where no motors previously existed; or Addition of a motor exceeding the size of all other motors connected within a Facility with at least 500 hp of motors
Changes in protection schemes or settings	Changes in settings for under-frequency load shedding
Changes in Harmonic levels	Addition or removal of steel casting or steel smelter loads
A change in end-user Facility topology that may affect power flows on the BES	Changes to interruptible loads being interrupted during peak load periods Addition of distributed energy resources (DER) more than 0.5MW at a distribution substation