# Appendix N Pseudo-Tie Protocols

## 1. Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area

## 1.1 Consistency with NERC/WECC Requirements

**1.1.1** Operation of Pseudo-Tie functionalities must comply with all applicable NERC, WECC, and North American Energy Standards Board (NAESB) reliability standards, policies, requirements, and guidelines regarding inter-Balancing Authority Area scheduling. A Pseudo-Tie must be registered as a “Point Of Delivery” (POD) with the NAESB Electric Industry Registry (EIR). All (off-system) static scheduling associated with Pseudo-Tie functionality must be consistent with NERC Reliability Standards for interchange scheduling and coordination.

### 1.2 CAISO Operating, Technical, and Business Requirements

**1.2.1 Operating Requirements**

**1.2.1.1** The CAISO shall establish and specify the location of any Pseudo-Tie between the CAISO Balancing Authority Area and the Native Balancing Authority Area. All Dynamic Schedules and delivered Energy from a Pseudo-Tie Generating Unit shall be subject to the standard CAISO Transmission Loss calculation as described in Section 27.5.1.1 and Appendix C of the CAISO Tariff.

**1.2.1.2** A Pseudo-Tie Generating Unit must transfer dynamically its entire output of its Real-Time Generation production into the CAISO Balancing Authority Area at the associated pre-determined CAISO Intertie, regardless of whether the Pseudo-Tie Generating Unit represents the entire Generating Unit that is Pseudo-Tied into the CAISO Balancing Authority Area in accordance with Section 1 of this Appendix N or only a share of a Generating Unit that is Pseudo-Tied into the CAISO Balancing Authority Area in accordance with Section 3 of this Appendix N. A Pseudo-Tie Generating Unit must be permanently associated with a particular pre-determined CAISO Intertie. Any dynamic transfers of Energy, and/or Energy associated with Ancillary Services will be subject to Congestion mitigation at the associated pre-determined CAISO Intertie. The CAISO may, from time to time and at its discretion, allow for a change in such pre-established association of the Pseudo-Tie Generating Unit with a particular CAISO Intertie. Any change to the designated path is subject to approval by all applicable transmission providers.

**1.2.1.3** A Pseudo-Tie Generating Unit shall operate under the terms of the CAISO Tariff applicable to the Generating Units of Participating Generators in the CAISO Balancing Authority Area except as expressly provided, including requirements to promptly follow CAISO Dispatch Instructions, Exceptional Dispatch Instructions, Operating Instructions as defined in the CAISO Tariff, and other instructions, without limitation, pursuant to Sections 7.6 and 7.7 of the CAISO Tariff and any CAISO Operating Procedure established specifically for the Pseudo-Tie, including in the event of an overload condition at the associated pre-determined CAISO Intertie.

**1.2.1.4** A Participating Generator with a Pseudo-Tie Generating Unit shall demonstrate the ability to deliver the Pseudo-Tie Generating Unit’s maximum output to the associated pre-determined CAISO Intertie by providing the CAISO with a copy of its interconnection agreement with the Balancing Authority for its Native Balancing Authority Area.

**1.2.1.5** Firm transmission for the Operating Hour in a form agreed to by the CAISO must be reserved for the Pseudo-Tie Generating Unit output transfers into the CAISO Balancing Authority Area across the entire transmission path external to the CAISO Balancing Authority Area sufficient to permit delivery of an amount equal to at least the self-scheduled Generation of a Pseudo-Tie Generating Unit. In the event that a sufficient transmission reservation has not been established prior to the Operating Hour to support Dispatch up to the Pseudo-Tie Generating Unit’s maximum available capacity, and additional transmission will not be available within the Operating Hour, a derate must be reported in the CAISO’s Outage management system to limit its Dispatch to its available transmission.

**1.2.1.6** All Energy transfers associated with a Pseudo-Tie Generating Unit must be electronically tagged (E-tagged).

**1.2.1.7** The CAISO will treat all dynamically transferred Pseudo-Tie Generating Unit Energy as internal CAISO Balancing Authority Area Generation (except that it will be subject to Congestion determined by the scheduling capacity of the associated pre-determined CAISO Intertie) and will procure, or ensure self-provision of, required Operating Reserves for the CAISO Balancing Authority Area Loads served by a Pseudo-Tie Generating Unit.

**1.2.1.8** All dynamic Energy transfers associated with CAISO procurement of Spinning Reserve and Non-Spinning Reserve from a Pseudo-Tie Generating Unit will be afforded similar treatment (i.e., treatment as internal CAISO Balancing Authority Area Generation, except that it will be subject to Congestion determined by the scheduling capacity of the associated pre-determined CAISO Intertie).

**1.2.1.9** Off-system sales pursuant to a Pseudo-Tie Participating Generator Agreement shall only be delivered from the Pseudo-Tie Generating Unit. The maximum allowable off-system sales of Energy from a Pseudo-Tie Generating Unit may not exceed the Pseudo-Tie Generating Unit’s scheduled output. Off-system sales shall be treated as a firm fixed static export from the CAISO Balancing Authority Area.

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## 2. Pseudo-Ties of Generating Units out of the CAISO Balancing Authority Area

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### 2.3 Operating Agreements

**2.3.1** A Pseudo-Tie of a generating unit out of the CAISO Balancing Authority Area shall be conditional on the facilitation by the Balancing Authority for the Attaining Balancing Authority Area of the Pseudo-Tie functionality in accordance with an operating agreement to be entered into between the Balancing Authority for the Attaining Balancing Authority Area and the CAISO specific to Pseudo-Tie functionality.

**2.3.2** The owner of a Pseudo-Tie generating unit shall comply with its contractual obligations with the owners of the facilities to which the Pseudo-Tie generating unit is interconnected and/or the Attaining Balancing Authority Area that affect in any way the ability of the owner of the Pseudo-Tie generating unit to perform its obligations under the CAISO Tariff and an agreement to be entered into between the owner of the Pseudo-Tie generating unit and the CAISO.

## 3. Pseudo-Ties of Shared Resources to the CAISO Balancing Authority Area

**3.1 Eligibility**

**3.1.1** An eligible Pseudo-Tie Generating Unit may qualify as a Pseudo-Tie of a shared Generating Unit if, in addition to all other applicable requirements, the shared Generating Unit also fulfills the requirements of this Section 3 of Appendix N. A shared Generating Unit that fulfills the additional requirements of this Section 3 of Appendix N may register as a Pseudo-Tie Generating Unit. Nothing in this Section 3 of Appendix N restricts a shared Generating Unit registered as a Pseudo-Tie Generating Unit from transitioning its participation in the CAISO Markets from a Pseudo-Tie Generating Unit to a System Resource, or vice versa, provided it has successfully registered as such with the CAISO and meets all the requirements of a System Resource.

**3.1.2** A Scheduling Coordinator must represent each Generating Unit share that participates in a CAISO Market. A Scheduling Coordinator that represents a share of a Multi-Stage Generating Resource will not be required to register that share in accordance with Section 27.8, and the CAISO will not model any specific resource characteristic that it otherwise would model if the resource were registered as a Multi-Stage Generating Resource, or that represents a Forbidden Operating Region.

**3.1.3** Each Generating Unit share must separately register with the CAISO as an independent Generating Unit according to the rules applicable to the CAISO Market in which it will participate. If a resource share is located in a Native Balancing Authority Area that is an EIM Entity Balancing Authority Area and the share is not Pseudo-Tied to the CAISO Balancing Authority Area, the share must also register as an EIM Resource unless it is Pseudo-Tied to a Balancing Authority Area outside of the EIM Area.

**3.1.4** The registration of the Pseudo-Tie Generating Unit must identify the allocation of key attributes in Schedule 1 of its Pseudo-Tie Participating Generator Agreement consistent with the allocation protocol methodology, including the allocation of telemetry, metered output, non-negative values for minimum output, Minimum Load Costs, Start-up Costs, and maximum output levels.

**3.2 Allocation Protocol**

**3.2.1** Each Scheduling Coordinator that represents a Generating Unit share participating in a CAISO Market as a Pseudo-Tie Generating Unit must operate in accordance with an allocation protocol. The resource owners must agree upon a shared resource allocation protocol that satisfies the CAISO allocation protocol requirements of this Section 3 of Appendix N, and they must appoint a Scheduling Coordinator as the protocol administrator. The Scheduling Coordinator appointed as the protocol administrator will provide telemetry to CAISO, coordinate the shared logical metering procedure, and ensure that the combined operational characteristics of the shares do not exceed the associated physical capability of the resource. The obligations of the Scheduling Coordinator appointed as the protocol administrator are in addition to the obligations of a Scheduling Coordinator that represents any individual share.

**3.2.2** The CAISO will review the allocation protocol according to the timelines and implementation details established in the Business Practice Manuals, and will approve the allocation protocol prior to participation in a CAISO Market by the shared Generating Unit as a Pseudo-Tied Generating Unit if the allocation protocol meets the requirements of this Section 3 of Appendix N and the Business Practice Manuals. Any modifications proposed to the shared resource allocation protocol will only be effective following subsequent approval by the CAISO in accordance with the timelines and implementation details established in the Business Practice Manuals.

**3.2.3** The CAISO will have the right to require the Scheduling Coordinator appointed as the protocol administrator to submit documentation that demonstrates compliance with the allocation protocol. Each Scheduling Coordinator that represents a Generating Unit share that participates in a CAISO Market will remain individually responsible for compliance with the allocation protocol. The allocation protocol may also provide for an auditable self-monitoring compliance mechanism, such as regular reporting to CAISO to explain any matters of significance concerning administration of the allocation protocol.

**3.2.4** If the CAISO finds that the Pseudo-Tie Generating Unit materially deviates from its allocation protocol, the CAISO will notify the responsible Scheduling Coordinator and will suspend the Pseudo-Tie Generating Unit’s participation in the CAISO Markets as a shared Generating Unit pursuant to this Section 3 of Appendix N pending a final determination of the CAISO’s finding(s). Within five business days of the CAISO’s notification, the Scheduling Coordinator must either: (1) object to the CAISO’s determination and seek resolution of the disputed facts through the CAISO ADR Procedures; (2) or admit to the CAISO’s findings. The suspension will remain in place until the dispute has been resolved. During the suspension period, the Pseudo-Tie Generating Unit may participate in the CAISO Markets as a System Resource, provided it has successfully registered as such with the CAISO and meets all the requirements of a System Resource. If the Scheduling Coordinator admits to the CAISO’s findings or the CAISO ADR Procedures confirm the CAISO’s findings, the CAISO will terminate the Pseudo-Tie Generating Unit from the Pseudo-Tie Participating Generator Agreement within two Business Days of the date on which either the Scheduling Coordinator admits to the CAISO’s findings in writing, or CAISO ADR Procedures have reached a final determination supporting the CAISO’s findings. Following termination, the Pseudo-Tie Generating Unit may participate in the CAISO Markets as a System Resource, provided it has successfully registered as such with the CAISO and meets all the requirements of a System Resource. If the final determination resulting from the CAISO ADR Procedures does not support the CAISO’s findings, the CAISO will reinstate participation as a Pseudo-Tied Generating Unit consistent with the CAISO’s procedures and requirements for participation in the CAISO Markets pursuant to this Section 3 of Appendix N.

**3.2.5** If the CAISO finds that the Pseudo-Tie Generating Unit’s participation in the CAISO Markets, even if consistent with the allocation protocol, is exploiting or may exploit the Bid Cost Recovery mechanism to the benefit of the Scheduling Coordinator or is causing inequitable allocation of Bid Cost Recovery between the affected Balancing Authority Areas, the CAISO will notify the responsible Scheduling Coordinator and will suspend the Pseudo-Tie Generating Unit’s participation in the CAISO Markets as a shared Generating Unit pursuant to this Section 3 of Appendix N pending a final determination of the CAISO’s finding(s). During the suspension period, the Pseudo-Tie Generating Unit may participate in the CAISO Markets as a System Resource, provided it has successfully registered as such with the CAISO and meets all the requirements of a System Resource.

**3.3 Telemetry**

**3.3.1** The Scheduling Coordinator appointed as the protocol administrator must provide separate telemetry data for each Pseudo-Tie Generating Unit, EIM Resource or other resource share, in addition to telemetry data for the entire resource and any other telemetry data required for participation in the CAISO Markets, which will be tested and confirmed prior to participation in the CAISO Markets. Resource shares located in Balancing Authority Areas outside of the EIM Area that do not participate in a CAISO Market should also follow the telemetry process documented in the allocation protocol, in addition to any other telemetry requirements of the Native Balancing Authority Area.

**3.4 Metering**

**3.4.1** Generating Unit shares participating in a CAISO Market must establish a SQMD plan, which will be subject to approval by CAISO pursuant to the requirements for Scheduling Coordinator Metered Entities. The SQMD plan must:

1. ensure that the sum of the calculated logical metered resource shares match the total output of the resource;
2. reflect that the logical metering for each share will follow the Dispatch Instruction to the extent feasible;
3. explain how a resource share deviation from a Dispatch Instruction will be managed, and confirm that Uninstructed Deviations assigned to a Generating Unit share delivered to the CAISO Balancing Authority Area will not exceed a pro-rata allocation proportional to the Instructed Imbalance Energy in each Settlement Interval; and
4. account for the allocation of Outages among the resource shares.

**3.4.2** The native EIM Entity will report its Meter Data for Settlement and E-Tags for Interchange accounting according to the general requirements applicable to EIM Entities. Meter Data for resource shares located in Balancing Authority Areas outside of the EIM Area that do not participate in a CAISO Market should follow the logical metering process documented in the SQMD plan submitted by the associated Pseudo-Tie Generating Unit, in addition to any other metering requirements of the Native Balancing Authority Area.

**3.5 Outages**

**3.5.1** If a Generating Unit participating in a CAISO Market experiences an Outage, each Scheduling Coordinator will be required to report the Outage for the Generating Unit share it represents according to the Outage reporting requirements of Section 9 or Section 29.9, as applicable. Allocation of an Outage among shares other than a proportional sharing of the Outage (*i.e.,* pro-rata based on the PMax of each share at the time of the Outage) must be supported by operational characteristics or pre-existing contractual obligations. The allocation protocol must identify the operational characteristics or pre-existing contractual obligations that may lead to disproportionate Outage allocation and describe the Outage allocation under such conditions and requirements, including the formula for calculating the Outage allocation among the shares.

**3.6 Start-up Costs and Minimum Load Costs**

**3.6.1** Start-Up Costs and Minimum Load Costs should be equitably allocated among the Generating Unit and the other shares based on the proportion of costs. The cost sharing proportions must be documented in the allocation protocol and include a description of how compliance will be monitored and verified in comparison to the overall costs. In general, the sum of the costs for each Generating Unit and the other shares must not exceed the total costs that would be represented if the shared resource were participating in a CAISO Market as a single resource.

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**Appendix B.16 Pseudo-Tie Participating Generator Agreement**

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**SCHEDULE 1**

**(The following is a placeholder for Schedule 1 information, which contains the GENERATING UNIT, PSEUDO-TIE, AND NATIVE BALANCING AUTHORITY AREA Technical Information and Other Unique Characteristics)**

**[Sections 4.1.2 and 4.1.3]**

**(The following is a placeholder for Schedule 1 information associated with a Pseudo-Tie Generating Unit participating in the CAISO Markets pursuant to Section 3 of Appendix N]**

**[Section 4.1.2]**