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| Transmission Reliability Margin  Implementation Document  For NERC Standard MOD-008-1  **12/21/11 DRAFT** |

1. **Purpose**

The California Independent System Operator Corporation (ISO), as a registered Transmission Operator (TOP)[[1]](#footnote-1) with the North American Electric Reliability Corporation (NERC), must comply with NERC reliability standards applicable to that function. MOD-008-1 requires each TOP that maintains Transmission Reliability Margin (TRM) to prepare and keep current a TRM Implementation Document (TRMID) that identifies each component of uncertainty the TOP considers in establishing TRM, describes how TRM is calculated and allocated for each component is used to establish a TRM value for each applicable time period. This TRM ID was developed to comply with NERC standard MOD-008-1.

This TRMID shall be available on the ISO OASIS at <http://www.caiso.com/235f/235fcbd556310.html>. (MOD-008-1 R2)

1. **Identification of Components of Uncertainty in TRM (MOD-008-1 R1.1)**

The ISO considers the following components of uncertainty in establishing for ATC Paths located at intertie points:

* Forecast uncertainty in Transmission system topology (including, but not limited to, forced or unplanned outages and maintenance outages).
* Allowances for parallel path (loop flow) impacts.
* Allowances for simultaneous path interactions.

1. **Description of Method Used to Calculate and Allocate TRM for Each Component of Uncertainty (MOD-008-1 R1.2)**

The ISO uses the following methods to calculate and allocate TRM values for each of the components of uncertainty identified in Section 2.0 of this TRMID.

* 1. **Forecast uncertainty in Transmission system topology (including, but not limited to, forced or unplanned outages and maintenance outages).**

In the event that there is uncertainty about the availability in Real Time[[2]](#footnote-2) of certain Transmission system resources due to potential Forced Outages, the ISO would utilize TRM to manage risk and reliability, using a TRM value up to the amount of the expected path limit reduction (the potential additional ATC Path derate) for the impacted ATC Paths.

***Example:*** If an ATC Path is rated at 1000 MW during system intact, and, as a result of approaching fires, there is an uncertainty of full availability due to a potential Forced Outage that may derate the ATC path by 200 MW to a new rating of 800 MW, then the ISO would utilize up to 200 MW of TRM values for the time period during which that uncertainty exists.

* 1. **Allowances for parallel path (loop flow) impacts.**

In the event that the ISO forecasts, based on currently observed parallel path (loop flow) conditions and projected scheduled flow for an upcoming Operating Hour[[3]](#footnote-3), that parallel path (loop flow) impacts will be realized in Real Time over a qualified ATC Path in amounts sufficient to trigger Step 2 or higher of the WECC Unscheduled Flow Mitigation Procedure (WECC USF Procedure)[[4]](#footnote-4) for that Path, the ISO may establish for that Path a TRM value up to the amount that would be required to be curtailed in Real Time under the applicable Step of the WECC USF Procedure.

***Example:*** An ATC Path has a TTC value of 1000 MW, the path is a qualified path for the WECC USF Procedure, and the following conditions exist:

* + Unscheduled flow + Real Time flow is forecasted to be above Path TTC, ***And***

* + Unscheduled flow is forecasted to be > 5% of the Path’s Unscheduled flow applicable limit ***And***
  + It is expected based on the forecast that WECC USF Procedure Step 2 will need to be invoked in Real Time absent application of a TRM.
* ***Then*** 
  + The ISO may utilize up to 5% of Path TTC as the TRM value for the impacted Path for the next available run of the ISO’s Hour-Ahead Scheduling Process (HASP).[[5]](#footnote-5)

When it is expected based on the forecast that WECC USF Procedure Step 6 or 7 will need to be invoked in Real Time absent application of a TRM, the ISO will utilize up to 6% of Path TTC as the TRM value for the impacted Path for the next available HASP run.

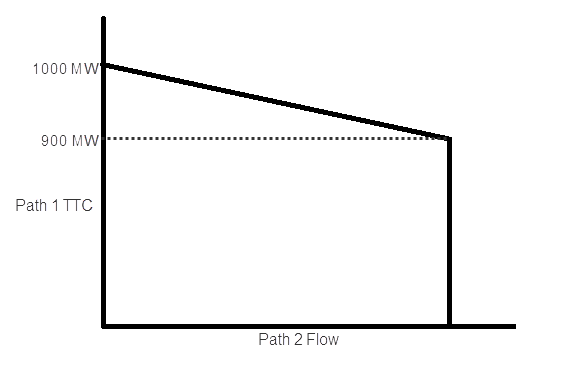
When it is expected based on the forecast that WECC USF Procedure Step 8 or 9 will need to be invoked in Real Time absent application of a TRM, the ISO will utilize up to 7% of Path TTC as the TRM value for the impacted Path for the next available HASP run.

* 1. **Allowances for simultaneous path interactions.**

The ISO generally does not limit the TTC of an ATC Path due to the simultaneous interaction with another path in the form of a nomogram that is enforced prior to Real Time. Rather, the impact of the interaction between multiple ATC Paths is accounted for with nomograms enforced in Real-Time, either in an automated manner through market systems or manually through monitoring by operations staff, to ensure there are no violations of the System Operating Limit.

There are, however, a number of ISO ATC Paths that have simulataneous interactions with non-ISO ATC Paths. In the event that one or more ISO ATC Paths become constrained due to interactions with another non-ISO ATC Path, TRM may be utilized to ensure there are no violations of the System Operating Limit in the ISO ATC Path. The amount of TRM value assigned will be set to be no greater than the impact of its interaction with the non ISO ATC Path.

***Example:*** If an ATC Path within ISO is found to be dependant with other ATC Paths as seen in Figure Below:



In the example above, the ISO may utilize up to 100 MW of TRM value in Path 1 if the ISO forecasts that Path 2 flow would be at its maximum.

1. **Identification of TRM Calculation for Different Time Periods and its calculation frequency (MOD-008-1 R1.3 and R4)**

For the day-ahead and pre-schedule time period (as referenced in R.1.3.2 of NERC’s MOD-008-1), the ISO sets its TRM values at 0 MW at all times.

For the beyond day-ahead and pre-schedule, up to thirteen months ahead, time period (as referenced in R.1.3.3 of NERC’s MOD-008-1), the ISO also sets its TRM values at 0 MW at all times.

The hourly TRM values for Real Time and same day (as referenced in R.1.3.1 of NERC’s MOD-008-1) are established on the day of dispatch, no earlier than 2 hours in advance of dispatch.. Whenever a TRM value greater than zero is established due to the existence of one or more of the components of uncertainty identified in Section 2.0 above, the hourly TRM values will be set for the duration of the periods during which the applicable component of uncertainty is expected to occur, in accordance with the methodology set forth in Section 3.1-3.3 above..

1. **Using Components of Uncertainty (MOD-008-1 R2)**

The ISO does not maintain Capacity Benefit Margin (CBM). Therefore, the ISO does not include any of the components of CBM establish its TRM values.

The only components of uncertainty included in TRM are those listed in Section 2.0 of this document.

1. **TRM Reference Materials**

* Additional ISO documentation associated with TRM can be found atISO Tariff, Appendix L. The ISO Tariff is available on the ISO’s public website.

1. **Posting TRM Values (MOD-008 R5)**

The TRM values established by the ISO will be made public and posted in OASIS.

1. **Revisions to TRMID**

This document reflects the ISO’s current TRMID. In the event that the ISO determines that it is necessary to revise any aspect of the process or methodology covered by this document, the ISO will issue a revised TRMID, which will be made publicly available and posted on OASIS.

1. Unless otherwise noted, capitalized terms have the meaning set forth in the current NERC Glossary of Terms. This Glossary is located on NERC’s website. [↑](#footnote-ref-1)
2. “Real Time” is defined in Appendix A of the ISO Tariff. [↑](#footnote-ref-2)
3. “Operating Hour” is defined in Appendix A of the ISO Tariff. [↑](#footnote-ref-3)
4. The WECC USF Procedure followed by the ISO is set forth in ISO Operating Procedure 3510, which is available on the ISO’s public website. The ISO’s WECC USF Procedure implements the WECC Unscheduled Flow Reduction Guideline, which is set forth as Appendix 3510A to Operating Procedure 3510. [↑](#footnote-ref-4)
5. The “Hour Ahead Scheduling Process (HASP)” is defined in Appendix A of the ISO Tariff. [↑](#footnote-ref-5)