 California ISO	Operating Procedure	Procedure No.	2360
		Version No.	7.0
		Effective Date	11/24/2020
Real-Time Generator Forbidden Operating Regions		Distribution Restriction: None	

Table of Contents

PURPOSE	1
1. RESPONSIBILITIES	1
2. SCOPE/APPLICABILITY	2
2.1. Background	2
2.2. Scope/ Applicability.....	2
3. PROCEDURE DETAIL	2
3.1. Real-Time Forbidden Operating Regions.....	2
3.2. Simplified Forbidden Operating Region	4
4. SUPPORTING INFORMATION	6
Operationally Affected Parties	6
References.....	6
Definitions	6
Version History.....	6
5. PERIODIC REVIEW PROCEDURE	7
Review Criteria & Incorporation of Changes.....	7
Frequency	7
APPENDIX	7


Purpose

Provides guidelines for dispatching and responding to Dispatches for Generating Units that have Forbidden Operating Regions (FOR), in the Real-Time Market (RTM).

1. Responsibilities

Scheduling Coordinator (SC)	<ul style="list-style-type: none"> • Evaluate Schedules and Awards for potential FOR impacts. • Contact ISO Generation Desk for resolution when impacts are identified.
ISO Generation Desk	<ul style="list-style-type: none"> • Respond to SC communications of FOR issue. • Maintain awareness of FOR issues not identified by SCs that may impact reliability.

*This document is controlled when viewed electronically.
When downloaded or printed, this document becomes UNCONTROLLED.*

 California ISO	Operating Procedure	Procedure No. 2360
		Version No. 7.0
		Effective Date 11/24/2020
Real-Time Generator Forbidden Operating Regions		Distribution Restriction: None

2. Scope/Applicability

2.1. Background

The market optimization software does not Dispatch resources within their Forbidden Operating Regions unless it is at the maximum applicable Ramp Rate to clear the Forbidden Operating Region in consecutive Dispatch Intervals or the self-schedule is inside a Forbidden Operating Region. Resources ramping through a Forbidden Operating Region shall not set the Locational Marginal Price (LMP) at its location and cannot provide Ancillary Services (AS) and will not be called upon to provide AS, unless the resource can cross the Forbidden Operating Region in less than fifteen (15) minutes. Ramping through a Forbidden Operating Region, the resource will not be eligible to set the LMP. If the resource has Forbidden Operating Regions, each Forbidden Operating Region must be reflected as a single, separate Energy Bid curve segment.

2.2. Scope/ Applicability

This procedure applies to the Real-Time Market (RTM) process.


3. Procedure Detail

3.1. Real-Time Forbidden Operating Regions

The following provides guidance for dispatching and responding to Dispatches in the RTM for Generating Units with Forbidden Operating Regions:


ISO Generation Desk
<p>Note: <i>Forbidden Operating Region management in RT is accomplished as part of the RTM optimization.</i></p> <p>Note: <i>The need to constrain resources around Forbidden Operating Regions may be necessary even after Simplified Forbidden Operating Region functionality is enforced because the constraint for a hold time is not addressed.</i></p> <ol style="list-style-type: none"> 1. Observe reliability impacts due to AS Awards, system conditions, or Congestion, from resources with Forbidden Operating Regions <ul style="list-style-type: none"> • If a resource’s operational conditions impact grid reliability <ul style="list-style-type: none"> ○ Consider constraining one side of a Forbidden Operating Region ○ Continue to recognize the implied Ramp Rate through the Forbidden Operating Region based on transit time

*This document is controlled when viewed electronically.
When downloaded or printed, this document becomes UNCONTROLLED.*

 California ISO	Operating Procedure	Procedure No.	2360
		Version No.	7.0
		Effective Date	11/24/2020
Real-Time Generator Forbidden Operating Regions		Distribution Restriction: None	

ISO Generation Desk	
<ul style="list-style-type: none"> ○ Consider constraining the resource through an Exceptional Dispatch for reliability in accordance with ISO Operating Procedure 2330 Real-Time Exceptional Dispatch. 	<ol style="list-style-type: none"> 2. Observe infeasibilities due to conflicts with AS Awards, initial conditions, Self-Schedules, shutdowns, transit conditions, and Regulation <ul style="list-style-type: none"> • If the resource's operational conditions impact grid reliability <ul style="list-style-type: none"> ○ Consider constraining one side of a Forbidden Operating Region ○ Continue to recognize the implied Ramp Rate through the Forbidden Operating Region based on transit time ○ Consider constraining the resource through an Exceptional Dispatch for reliability in accordance with ISO Operating Procedure 2330 Real-Time Exceptional Dispatch 3. Observe situations where a resource is Dispatched into a Forbidden Operating Region and then turned around before transiting through Forbidden Operating Region <ul style="list-style-type: none"> • If the resource's operational conditions impact grid reliability <ul style="list-style-type: none"> ○ Continue to recognize the implied Ramp Rate through Forbidden Operating Region based on transit time ○ Consider constraining the resource through an Exceptional Dispatch for reliability in accordance with ISO Operating Procedure 2330 Real-Time Exceptional Dispatch 4. If there is no impact to reliability or grid management <ul style="list-style-type: none"> • Continue to the next step

Scheduling Coordinator (SC)	
<ol style="list-style-type: none"> 1. Contact ISO Generation Dispatcher to determine if resource is impacting grid reliability 2. If the resource's operational conditions impact grid reliability <ul style="list-style-type: none"> • Request ISO Generation Desk constrain the resource through an Exceptional Dispatch 3. If there is no impact to grid reliability <ul style="list-style-type: none"> • Continue to the next step 4. Consider constraining a resource outside of the Forbidden Operating Region via an outage entry via the outage management system (OMS) using the Transitional Limitation Nature of Work. 5. Refer to Table 1 for guidance on when a Forbidden Operating Region is enforced. 	

 California ISO	Operating Procedure	Procedure No.	2360
		Version No.	7.0
		Effective Date	11/24/2020
Real-Time Generator Forbidden Operating Regions		Distribution Restriction: None	

3.2. Simplified Forbidden Operating Region

The following describes Simplified Forbidden Operating Regions:

Simplified Forbidden Operating Regions (SFORs) are distinct non-overlapping Operating Regions within which resources cannot operate stably. A resource may be Scheduled or Dispatched within an SFOR in an interval only if it takes longer than the duration of the interval to cross that region. In such case, the resource must be Scheduled or Dispatched in subsequent intervals in the same direction (up or down) so that it clears the SFOR in the least number of intervals possible. Prior to crossing the SFOR, the resource will first be Dispatched to the SFOR boundary and then cross in subsequent interval(s). A resource that is Scheduled, Dispatched, or cannot transition within a RTPD interval through the SFOR is not eligible to provide AS in that interval.

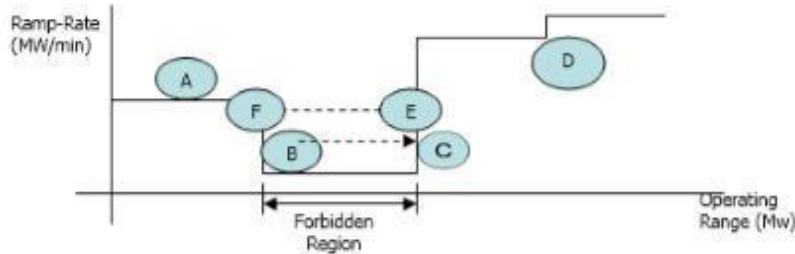
Please refer to **Table 1 - Comparison of Operation With and Without Forbidden Operating Regions Enforced**, on the following page.




Real-Time Generator Forbidden Operating Regions

Distribution Restriction: None

Table 1- Comparison of Operation With and Without Forbidden Operating Regions Enforced



Operating Level	Actions with Forbidden Operating Region Enforced	Actions without Forbidden Operating Region Enforced in RT
A	Nothing while resource is dispatched below Forbidden Operating Region. Scheduling Coordinator may decide to submit temporary derate via OMS using the Transitional Limitation Nature of Work (NoW) to signal that upper operating range is not available until the resource has been below the Forbidden Operating Region for the minimum period of time (actual plant limitation).	Nothing while resource is Dispatched below Forbidden Operating Region. Scheduling Coordinator may decide to submit temporary derate via OMS using the Transitional Limitation Nature of Work (NoW) to signal that upper operating range is not available until resource has been below the Forbidden Operating Region for minimum period of time (actual plant limitation).
B	Nothing necessary, as enforcing the Forbidden Operating Region would ensure resource transited through the Forbidden Operating Region. Resource will first be Dispatched to the Forbidden Operating Region boundary, then cross the region in subsequent intervals based upon crossing time.	After first Dispatch enters lower end of Forbidden Operating Region, resource may need to be constrained from below by the upper end of the Forbidden Operating Region to ensure resource transits through Forbidden Operating Region.
C	An OMS outage entry or Exceptional Dispatch constraint may be needed to prevent the resource from returning to a lower range prior to when the minimum period of time has passed or operating conditions have relaxed.	An OMS outage entry or Exceptional Dispatch constraint may be needed to prevent the resource from returning to lower range prior to minimum period of time has passed or operating conditions have relaxed.
D	Nothing while resource is Dispatched above Forbidden Operating Region. Scheduling Coordinator may decide to submit a temporary OMS minimum re-rate to signal that lower operating range is not available until resource has been above Forbidden Operating Region for a minimum period of time.	Nothing while resource is Dispatched above Forbidden Operating Region. Scheduling Coordinator may decide to submit a temporary OMS minimum re-rate to signal that lower operating range is not available until resource has been above Forbidden Operating Region for minimum period of time.
E	Nothing necessary as enforcing the Forbidden Operating Region would ensure resource transited through the region. Resource will first be Dispatched to the Forbidden Operating Region boundary, then cross the region in subsequent intervals based upon crossing time.	Nothing while resource is Dispatched above Forbidden Operating Region. Scheduling Coordinator may decide to submit temporary OMS minimum re-rate to signal that lower operating range is not available until resource has been above Forbidden Operating Region for minimum period of time.
F	An OMS outage entry or Exceptional Dispatch constraint may be needed to prevent the resource from returning to upper range prior to minimum period of time has passed or operating conditions have relaxed.	An OMS outage entry or Exceptional Dispatch constraint may be needed to prevent the resource from returning to upper range prior to minimum period of time has passed or operating conditions have relaxed.

 California ISO	Operating Procedure	Procedure No.	2360
		Version No.	7.0
		Effective Date	11/24/2020
Real-Time Generator Forbidden Operating Regions		Distribution Restriction: None	

4. Supporting Information

Operationally Affected Parties

Shared with **the** Public.

References

Resources studied in the development of this procedure and that may have an effect upon some steps taken herein include but are not limited to:

CAISO Tariff	
ISO Operating Procedure	2330 Real-Time Exceptional Dispatch
NERC Requirements	
WECC Criterion	
Other References	

Definitions

Unless the context otherwise indicates, any word or expression defined in the Master Definitions Supplement to the CAISO Tariff shall have that meaning when capitalized in this Operating Procedure.


The following additional terms are capitalized in this Operating Procedure when used as defined below:

Crossing Time	The Forbidden Operating Region Ramp Rates, are static and are included in the FOR definition in the Master File, albeit not as Ramp Rates, but as Crossing Times; an average Ramp Rate can be derived by dividing the range of the FOR with its transition time.
----------------------	--

Version History

Version	Change	Date
6.0	Annual Review: Section 2.1: added content. Section 3.1: (SC) step 5, edited step. Changed SLIC outage references to OMS. All references to the use of Normal card in SLIC for Forbidden Operating Region derates were changed to use the Transitional Limitation Nature of Work in OMS.	2/27/15

*This document is controlled when viewed electronically.
When downloaded or printed, this document becomes UNCONTROLLED.*

 California ISO	Operating Procedure	Procedure No.	2360
		Version No.	7.0
		Effective Date	11/24/2020
Real-Time Generator Forbidden Operating Regions		Distribution Restriction: None	

Version	Change	Date
6.1	Conversion from SharePoint Word to Centric.	3/09/16
6.2	Section 1: Changed Interchange Scheduler (IS) to Transmission Dispatcher (TD). Section 3.1: Changed Interchange Scheduler (IS) to Transmission Dispatcher (TD). Minor format and grammar updates.	4/15/19
6.3	Sections 1 & 3.1: Updated by reverting back changes made with version 6.2 update to now reflect Scheduling Coordinator responsibility and actions. Minor format and grammar updates.	4/18/19
7.0	Periodic Review: Minor format and grammar updates and removed version history prior to 5-years.	11/24/20

5. Periodic Review Procedure

Review Criteria & Incorporation of Changes

There are no specific criteria for reviewing or changing this document, follow instructions in ISO Operating Procedure 5510.

Frequency

Every **three (3)** Years.

Appendix

No references at this time.

*This document is controlled when viewed electronically.
When downloaded or printed, this document becomes UNCONTROLLED.*