 California ISO Your Link to Power	OPERATING PROCEDURE	Procedure No.	E-502
		Version No.	4.2
		Effective Date	9/14/09
Emergency Manual Load Shedding		Distribution Restriction: NONE	


Table of Contents

Purpose	1
1. Implementation	2
2. Notification	3
3. Load Restoration	4
Supporting Information	6
Operationally Affected Parties.....	6
Responsibilities & Authority	6
References.....	6
Policy	7
Definitions.....	7
Version History.....	8
Technical Review	9
Approval	9

Purpose

Provides guidance for Emergency Manual Load Shedding throughout the CAISO Balancing Area when conditions require prompt action to:

- Ensure personnel safety
 - Preserve system integrity
 - Mitigate insufficient generating capacity
 - Mitigate Interconnection Reliability Operating Limit (IROL) overloads
 - Prevent cascading outages
 - Avoid a voltage collapse
 - Prevent equipment damage
-


 California ISO Your Link to Power	OPERATING PROCEDURE	Procedure No.	E-502
		Version No.	4.2
		Effective Date	9/14/09
Emergency Manual Load Shedding		Distribution Restriction: NONE	

1. Implementation

Take the following steps when Emergency Manual Load Shedding is necessary as an immediate solution for system emergencies (i.e. potential IROL or SOL violations, insufficient generating capacity etc.) where there might be insufficient time to initiate other procedures:

Step	CAISO Shift Supervisor or Designee Actions				
<p><i>Note: Emergency manual Load Shedding may be necessary to deal with:</i></p> <ul style="list-style-type: none"> • Line or facility overloading • Low voltage • Low frequency • Insufficient capacity (especially sudden onset) <p><i>Although referenced for detailed operating information, PTO/UDC Manual Load Shedding bulletins and/or operating procedures will be subordinate to this procedure, and reference in those bulletins to authority for either shedding or restoration of Load is superseded by this procedure. Immediate action on the part of the PTO/UDC control centers will be required to achieve the intended results.</i></p>					
1	<p>Direct staff to refer to the following additional related emergency CAISO Operating Procedures, as necessary:</p> <ul style="list-style-type: none"> • CAISO Operating Procedure E-503, Under-Frequency Load Shedding • CAISO Operating Procedure E-508, Electrical System Emergency 				
2	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #e0ffff;">If...</th> <th style="background-color: #e0ffff;">Then...</th> </tr> </thead> <tbody> <tr> <td>Emergency Manual Load Shedding is required on a Balancing Area-wide basis,</td> <td>Issue Emergency Manual Load Shedding requests on a pro-rata basis among PTO/UDCs based on the percentages listed in CAISO Operating Procedure E-508A, Involuntary Load-Reduction Worksheets.</td> </tr> </tbody> </table>	If...	Then...	Emergency Manual Load Shedding is required on a Balancing Area-wide basis,	Issue Emergency Manual Load Shedding requests on a pro-rata basis among PTO/UDCs based on the percentages listed in CAISO Operating Procedure E-508A, Involuntary Load-Reduction Worksheets .
If...	Then...				
Emergency Manual Load Shedding is required on a Balancing Area-wide basis,	Issue Emergency Manual Load Shedding requests on a pro-rata basis among PTO/UDCs based on the percentages listed in CAISO Operating Procedure E-508A, Involuntary Load-Reduction Worksheets .				

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 California ISO Your Link to Power	OPERATING PROCEDURE	Procedure No.	E-502
		Version No.	4.2
		Effective Date	9/14/09
Emergency Manual Load Shedding		Distribution Restriction: NONE	


Continued from page 2

Step	CAISO Shift Supervisor or Designee Actions					
3	<table border="1" style="width: 100%;"> <thead> <tr> <th style="background-color: #e0f7fa;">If...</th> <th style="background-color: #e0f7fa;">Then...</th> </tr> </thead> <tbody> <tr> <td>Emergency Manual Load Shedding is required in <u>only</u> a portion of the Balancing Area,</td> <td>Implement Emergency Manual Load Shedding in those areas where it will achieve the intended result.</td> </tr> </tbody> </table>		If...	Then...	Emergency Manual Load Shedding is required in <u>only</u> a portion of the Balancing Area,	Implement Emergency Manual Load Shedding in those areas where it will achieve the intended result.
If...	Then...					
Emergency Manual Load Shedding is required in <u>only</u> a portion of the Balancing Area,	Implement Emergency Manual Load Shedding in those areas where it will achieve the intended result.					
Step	UDCs and PTOs Actions					
4	Maintain manual Load Shedding procedures that are capable of shedding the connected Load.					
5	Maintain the capability to manually shed Load without unnecessary delay, upon direction from the CAISO, with a maximum response time of ten minutes.					
6	Provide the CAISO with a list of the pre-determined blocks by UDC that denotes the approximate MW value of load for both peak and minimum load periods.					

2. Notification

Take the following notification steps once Emergency Manual Load Shedding is deemed necessary to handle system emergencies:


Step	CAISO Shift Supervisor or Designee Actions
1	Notify the WECC RC of the steps taken and future plan of action.
2	Direct the implementation of the following notification procedures as necessary: <ul style="list-style-type: none"> ○ CAISO Operating Procedure E-507, Emergency Response Team ○ CAISO Operating Procedure N-703, Event Reporting and Regulatory Notification

 California ISO Your Link to Power	OPERATING PROCEDURE	Procedure No.	E-502
		Version No.	4.2
		Effective Date	9/14/09
Emergency Manual Load Shedding		Distribution Restriction: NONE	


3. Load Restoration

The following actions to restore manually-shed Load should occur when, in the judgment of the CAISO Shift Supervisor, such actions are deemed prudent and appropriate and if applicable, the WECC RC has granted permission:

Step	CAISO Shift Supervisor or Designee Actions					
<i>Caution: Due to operating constraints, it may be necessary to leave Load in a particular zone off while other Loads are restored.</i>						
1	Notify the following of the anticipated load restoration efforts: <ul style="list-style-type: none"> • WECC RC • Neighboring BAs and TOPs • Applicable PTOs 					
2	Monitor the following during the load restoration process: <ul style="list-style-type: none"> • System frequency • System voltages • System ACE 					
3	Restore load in blocks not greater than 5% of total online generating capacity.					
4	Verify sufficient generating resources are available to meet all NERC and WECC operating criteria					
5	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #e0ffff;">If...</th> <th style="background-color: #e0ffff;">Then...</th> </tr> </thead> <tbody> <tr> <td>The emergency situation has been mitigated and circumstances permit,</td> <td>Restore Load in the order it was shed (i.e., the first Load shed will be the first Load restored).</td> </tr> </tbody> </table>		If...	Then...	The emergency situation has been mitigated and circumstances permit,	Restore Load in the order it was shed (i.e., the first Load shed will be the first Load restored).
If...	Then...					
The emergency situation has been mitigated and circumstances permit,	Restore Load in the order it was shed (i.e., the first Load shed will be the first Load restored).					
6	Restore all firm Load <u>prior</u> to restoration of any Interruptible Load, unless operating constraints dictate otherwise.					
7	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #e0ffff;">If...</th> <th style="background-color: #e0ffff;">Then...</th> </tr> </thead> <tbody> <tr> <td>System conditions do not permit shed load to be restored within 30 minutes,</td> <td>Consider rotation of outages.</td> </tr> </tbody> </table>		If...	Then...	System conditions do not permit shed load to be restored within 30 minutes,	Consider rotation of outages.
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System conditions do not permit shed load to be restored within 30 minutes,	Consider rotation of outages.					
8	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #e0ffff;">If...</th> <th style="background-color: #e0ffff;">Then...</th> </tr> </thead> <tbody> <tr> <td>Load needs to be restored at the interties,</td> <td>Coordinate with other Balancing Areas and other WECC Sub-Regions through the WECC RC.</td> </tr> </tbody> </table>		If...	Then...	Load needs to be restored at the interties,	Coordinate with other Balancing Areas and other WECC Sub-Regions through the WECC RC.
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Load needs to be restored at the interties,	Coordinate with other Balancing Areas and other WECC Sub-Regions through the WECC RC.					

 California ISO Your Link to Power	OPERATING PROCEDURE	Procedure No.	E-502
		Version No.	4.2
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Emergency Manual Load Shedding		Distribution Restriction: NONE	

Step	PTO, UDC, & SUDC Actions					
9	Wait for CAISO direction (either directly or through the CAISO or through the applicable area control center) to restore load.					
10	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: cyan;">If...</th> <th style="background-color: cyan;">Then...</th> </tr> </thead> <tbody> <tr> <td>Automatic Load restoration occurs,</td> <td>Notify the CAISO and manually shed an equivalent amount of load to offset the load that was automatically restored.</td> </tr> </tbody> </table>		If...	Then...	Automatic Load restoration occurs,	Notify the CAISO and manually shed an equivalent amount of load to offset the load that was automatically restored.
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Automatic Load restoration occurs,	Notify the CAISO and manually shed an equivalent amount of load to offset the load that was automatically restored.					

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Emergency Manual Load Shedding		Distribution Restriction: NONE	

Supporting Information

Operationally Affected Parties


- N/A Posted on the Internet

Responsibilities & Authority

CAISO Shift Supervisor or Designee	Initiate implementation of this and related emergency operating procedures. Facilitate coordination of PTO/UDC load shedding plans.
CAISO NERC Certified RT Operating Personnel	Hold authority, as delegated by the Executive Officers of the CAISO, to take or direct timely and appropriate real-time actions necessary to ensure reliable operation of the CAISO Controlled Grid, up to and including shedding of Firm Load to prevent or alleviate System Operating Limit or Interconnection Reliability Operating Limit violations. These actions may be performed without obtaining approval from higher-level personnel within the CAISO.
PTO/UDC	Implement and direct local area Load Shedding plans at the direction of the CAISO.

References

CAISO Operating Procedure	E-503, Under-Frequency Load Shedding
CAISO Operating Procedure	E-507, Emergency Response Team
CAISO Operating Procedure	E-508, Electrical Emergency Plan
CAISO Operating Procedure	E-508A, Involuntary Load-Reduction Worksheets
CAISO Operating Procedure	N-703, Event Reporting and Regulatory Notification
	SDG&E EOP-5120 - Emergency Manual Load Shedding
	SDG&E EOP-5130 – Under Frequency Load Drop Schedule
	SCE SOB 115 - Load Shedding and Interconnection Separation Procedure
	SCE SOB 21 Manual Load Shed Procedure A/B/C
	WECC Operations Committee Handbook
	WECC Regional Security Plan
NERC Reliability Standard	EOP-003 PER-001 bookmark: R1 VAR-001 TOP-008 R1

	OPERATING PROCEDURE	Procedure No.	E-502
		Version No.	4.2
		Effective Date	9/14/09
Emergency Manual Load Shedding		Distribution Restriction: NONE	


Policy

The CAISO will utilize existing PTO/UDC Manual Load Shedding procedures to match the load demand with the available resources; allowing the frequency and voltage to recover, minimizing additional loss of Generation, and preventing a total system collapse. As necessary, the CAISO will implement procedures for Manual Load Shedding in amounts required to stabilize the electric system and expedite frequency and voltage recovery while maintaining acceptable levels of operating reserves within the CAISO Balancing Area.

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.

PTO	Participating Transmission Owner
SUDC	Small Utility Distribution Company, annual peak is less than 25 MW and is not in a local reliability area.
UDC	Utility Distribution Company

	OPERATING PROCEDURE	Procedure No.	E-502
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Version	Change	By	Date
1.0	Drafted		12/15/97
1.0	Revised		1/14/98
1.1	Reformat and structure Periodic Check for Accuracy		4/13/00
1.2	Referenced E-508 for current years percentages		2/7/01
1.3	Re-formatted, Annual review		4/11/02
1.4	Annual review		8/1/03
1.5	Annual review		10/01/04
1.6	Reformatted.		3/22/05
1.7	Added SUDC and clarified section 3		4/28/05
2.0	Put version 1.6 back – not ready for SUDC term		5/4/05
3.0	Put SUDC back in		2/3/06
3.1	Added CAISO NERC Certified RT Operating Personnel to Responsibility section.		11/15/06
3.2	Annual Review		12/11/07
4.0	Annual Review, changes throughout		9/12/08
4.1	Annual Review		8/26/09
4.2	Added further guidance in Section 1. Implementation		9/14/09

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Technical Review

Reviewed By Content Expert	Signature	Date
Ops Support		
Operations Compliance		
Regional Transmission		
Grid Ops		
Market Ops		
Scheduling		

Approval

Approved By	Signature	Date
Director of Operations Support		
Director of Grid Operations		

* Signed previous version only, changes to this version were minor and did not require full signature approval