
 <b>California ISO</b> Your Link to Power	<b>OPERATING PROCEDURE</b>	Procedure No.	E-511
		Version No.	7.0
		Effective Date	4/7/09
<b>Interruptible Load Programs</b>		<b>Distribution Restriction: NONE</b>	

## Table of Contents

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<b>Purpose</b> .....	<b>2</b>
<b>1. Warning Notice Actions with Stage 1 Imminent</b> .....	<b>3</b>
UDC Interruptible Load Programs Available Under a Warning Notice.....	3
<b>2. Stage I Emergency is Declared</b> .....	<b>5</b>
Stage 1 Flex Alert .....	5
<b>3. Stage 2 Emergency is Declared or is Unavoidable</b> .....	<b>6</b>
UDC Interruptible Load Available under a Stage 2 Emergency .....	6
<b>4. Curtailment of Interruptible Load for a Transmission Emergency</b> .....	<b>8</b>
<b>Supporting Information</b> .....	<b>9</b>
History.....	9
Affected Parties.....	9
Responsibilities .....	10
References.....	10
Policy .....	11
Definitions.....	11
Version History .....	12
<b>Technical Review</b> .....	<b>13</b>
<b>Approval</b> .....	<b>13</b>
<b>Appendix</b> .....	<b>13</b>
Attachment B: UDC Interruptible Load Limitations and Conditions .....	13
Attachment C: UDC Interruptible Load Curtailment Groups .....	13

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 <b>California ISO</b> Your Link to Power	<b>OPERATING PROCEDURE</b>	Procedure No.	E-511
		Version No.	7.0
		Effective Date	4/7/09
<b>Interruptible Load Programs</b>		<b>Distribution Restriction: NONE</b>	

## Purpose

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Describes the Interruptible Load Programs available to the CAISO during periods when:

- 1) Available resources are either forecasted to be, or are, insufficient to maintain adequate Operating Reserves,

**OR**


- 2) The CAISO is operating under a Transmission Emergency

The two Load Reduction programs available to the CAISO include:

- Stage 1 Flex Alert
- Utility Distribution Company (UDC) Interruptible Load Programs

**Note:** for emergency manual load shedding refer to [E-502, Emergency Manual Load Shedding](#).

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		Version No.	7.0
		Effective Date	4/7/09
<b>Interruptible Load Programs</b>		<b>Distribution Restriction: NONE</b>	


## 1. Warning Notice Actions with Stage 1 Imminent

### UDC Interruptible Load Programs Available Under a Warning Notice


Interruptible Load programs require time to fully implement, and, therefore, are most effective when their anticipated use is coordinated with the UDC in advance. Accordingly, the CAISO will notify UDCs and PTOs of the potential use of the interruptible load programs when the CAISO issues a Warning Notice and conditions are expected to be of sufficient duration to make the use of Interruptible Load a feasible option.

The following provides guidelines for implementing the Interruptible Load programs that are available under a Warning Notice:

Step	CAISO Shift Supervisor Actions	
1	<b>If...</b>	<b>Then...</b>
	A Warning Notice has been issued,	<p><b>Notify</b> UDCs (PG&amp;E, SCE, and SDG&amp;E) of possible interruption.</p> <p><b>Query</b> the UDCs (PG&amp;E, SCE, and SDG&amp;E) to determine the quantity of Interruptible Load available under the issuance of a Warning Notice.</p> <p><b>Determine</b> the amount of Interruptible Load the CAISO needs in each UDC area.</p>
2	<b>Verify</b> the maximum amount of energy requested from each UDC is not exceeded or the limitations and conditions not violated (refer to Attachment B, <a href="#">UDC Interruptible Load Limitations and Conditions</a> ).	
3	<b>Verify</b> (periodically, through the UDC) the Availability Limitations of the Interruptible Load contract have not been exceeded for each UDC that will be dispatched (refer to Attachment B, <a href="#">UDC Interruptible Load Limitations and Conditions</a> ).	
4	<b>If...</b>	<b>Then...</b>
	A Warning Notice is issued and a Stage 1 emergency is <u>imminent</u> <b>AND</b> all available resources have been considered (e.g. out-of-market, non-RA resources),	<b>Dispatch</b> (via telephone) the amount of Load that needs to be interrupted from each UDC.

 <b>California ISO</b> Your Link to Power	<b>OPERATING PROCEDURE</b>	Procedure No.	E-511
		Version No.	7.0
		Effective Date	4/7/09
<b>Interruptible Load Programs</b>		<b>Distribution Restriction: NONE</b>	


Step	UDC Actions					
5	<p><b>Implement</b> the Interruptible Load curtailment for the amount and at the time confirmed between the CAISO and UDC.</p> <p><b>Inform</b> the Interruptible Load Customers of real time conditions affecting the probability and duration of the curtailments (using the Alert, Warning, and Emergency notices as guidelines).</p>					
Step	CAISO Shift Supervisor Actions					
6	<table border="1" style="width: 100%;"> <thead> <tr style="background-color: #e0ffff;"> <th style="text-align: center;">If...</th> <th style="text-align: center;">Then...</th> </tr> </thead> <tbody> <tr> <td>           Operating Reserve is restored due to the implementation of Interruptible Load,  <b>AND</b> firm native Demand had previously been interrupted due to the sudden onset nature of the emergency,         </td> <td> <b>THEN release</b> the UDCs to restore appropriate amounts of firm native Demand (refer to Procedure <a href="#">E-508, Electrical System Emergency</a>).         </td> </tr> </tbody> </table>		If...	Then...	Operating Reserve is restored due to the implementation of Interruptible Load, <b>AND</b> firm native Demand had previously been interrupted due to the sudden onset nature of the emergency,	<b>THEN release</b> the UDCs to restore appropriate amounts of firm native Demand (refer to Procedure <a href="#">E-508, Electrical System Emergency</a> ).
If...	Then...					
Operating Reserve is restored due to the implementation of Interruptible Load, <b>AND</b> firm native Demand had previously been interrupted due to the sudden onset nature of the emergency,	<b>THEN release</b> the UDCs to restore appropriate amounts of firm native Demand (refer to Procedure <a href="#">E-508, Electrical System Emergency</a> ).					
7	<p><b>Restore</b> <u>all</u> firm native Demand <u>prior</u> to restoring any Interruptible Load.</p>					
8	<table border="1" style="width: 100%;"> <thead> <tr style="background-color: #e0ffff;"> <th style="text-align: center;">If...</th> <th style="text-align: center;">Then...</th> </tr> </thead> <tbody> <tr> <td>           The Stage 1 Emergency is downgraded and the Interruptible Load program is no longer needed to maintain adequate reserves,         </td> <td> <b>Direct</b> the UDC to restore all Interruptible Load.         </td> </tr> </tbody> </table>		If...	Then...	The Stage 1 Emergency is downgraded and the Interruptible Load program is no longer needed to maintain adequate reserves,	<b>Direct</b> the UDC to restore all Interruptible Load.
If...	Then...					
The Stage 1 Emergency is downgraded and the Interruptible Load program is no longer needed to maintain adequate reserves,	<b>Direct</b> the UDC to restore all Interruptible Load.					
Step	PTO/UDCs Actions					
9	<p><b>Restore</b> <u>all</u> firm native Demand <u>prior</u> to restoring any Interruptible Load (as directed by the CAISO).</p>					
10	<p><b>Restore</b> interrupted Demand in amounts and time frames as directed by the CAISO.</p>					

 <b>California ISO</b> Your Link to Power	<b>OPERATING PROCEDURE</b>	Procedure No.	E-511
		Version No.	7.0
		Effective Date	4/7/09
<b>Interruptible Load Programs</b>		<b>Distribution Restriction: NONE</b>	

## 2. Stage I Emergency is Declared

**Stage 1 Flex Alert** The following provides guidance for using the Flex Alert program:

Step	CAISO Shift Supervisor Actions				
1	<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>A Stage 1 Emergency is declared and it is expected that Operating Reserves will decline further,</td> <td><b>Direct</b> the Market Ops Desk to issue curtailment requests via a Stage 1 Flex Alert.</td> </tr> </tbody> </table>	If...	Then...	A Stage 1 Emergency is declared and it is expected that Operating Reserves will decline further,	<b>Direct</b> the Market Ops Desk to issue curtailment requests via a Stage 1 Flex Alert.
If...	Then...				
A Stage 1 Emergency is declared and it is expected that Operating Reserves will decline further,	<b>Direct</b> the Market Ops Desk to issue curtailment requests via a Stage 1 Flex Alert.				
Step	CAISO Market Ops Desk Actions				
2	<b>Issue</b> Stage 1 Flex Alert (when directed by the Shift Supervisor) with as much advanced notice as possible, but there is no lead-time requirement.				
3	<b>Issue</b> Stage 1 Flex Alert on Business Days prior to 1700 hours for the current operating day using the browser-based AWE Application, which issues an email, voice, and/or an text message to device addresses contained in a pre-defined group broadcast list contained in the MIR3 Dialogic System.				
4	<b>Issue</b> only one Stage 1 Flex Alert reduction request per operating day for any amount of hours required.				
5	<b>Specify</b> the start and end time of the requested Stage 1 Flex Alert curtailment.				

 <b>California ISO</b> Your Link to Power	<b>OPERATING PROCEDURE</b>	Procedure No.	E-511
		Version No.	7.0
		Effective Date	4/7/09
<b>Interruptible Load Programs</b>		<b>Distribution Restriction: NONE</b>	


### 3. Stage 2 Emergency is Declared or is Unavoidable

#### UDC Interruptible Load Available under a Stage 2 Emergency


Interruptible Load can require substantial amounts of time to fully implement, and is best used when the need is anticipated in advance. Accordingly, implementation of the Interruptible Load, available under a Stage 2 emergency, will be initiated when qualifying Emergency conditions are forecast, or during more rapid onset of Emergency conditions which are expected to be of sufficient duration to make the use of Interruptible Load a feasible option.

In all cases, prior to reduction of firm native Demand, the interruption of all available Interruptible Load will be requested. It is recognized that such requests may occur simultaneously. The timing of Interruptible Load contracts may not allow as rapid a response as is required to meet operating needs and a request for reduction of firm native Demand may be the only available and timely option. In such cases when firm native Demand must be reduced for system requirements, the UDCs shall interrupt all applicable Interruptible Load in addition to amounts requested for firm native Demand. The following provides guidelines for implementing the Interruptible Load programs that are available under a Warning Notice:

Step	CAISO Shift Supervisor Actions	
1	<b>If...</b>	<b>Then...</b>
	A Stage 2 Emergency is declared and is expected to continue for at least 60 min., <b>OR a Stage 2 Emergency is forecasted,</b> <b>AND</b> all potential added resources have been considered (e.g. out-of-market),	<b>Determine</b> the amount of Interruptible Load to be interrupted in each UDC area (CAISO responsibility).
2	<b>Verify</b> the maximum amount of energy requested from each UDC is not exceeded or the limitations and conditions not violated (refer to Attachment B, <a href="#">UDC Interruptible Load Limitations and Conditions</a> ).	
3	<b>Verify</b> (periodically, through the UDC) the Availability Limitations of the Interruptible Load contract have not been exceeded for each UDC that will be dispatched (refer to Attachment B, <a href="#">UDC Interruptible Load Limitations and Conditions</a> ).	
4	<b>Dispatch</b> (via telephone) the amount of Load that needs to be interrupted from each UDC.	

 <b>California ISO</b> Your Link to Power	<b>OPERATING PROCEDURE</b>	Procedure No.	E-511
		Version No.	7.0
		Effective Date	4/7/09
<b>Interruptible Load Programs</b>		<b>Distribution Restriction: NONE</b>	


Step	PTO/UDCs Actions					
5	<p><b>Implement</b> the Interruptible Load curtailment for the amount and at the time confirmed with the CAISO.</p> <p><b>Inform</b> the Interruptible Load Customers of real time conditions affecting the probability and duration of the curtailments (using the Alert, Warning, and Emergency notices as guidelines).</p>					
Step	CAISO Shift Supervisor Actions					
6	<table border="1" style="width: 100%;"> <thead> <tr> <th style="background-color: #e0ffff;">If...</th> <th style="background-color: #e0ffff;">Then...</th> </tr> </thead> <tbody> <tr> <td>           Operating Reserve is restored due to the implementation of Interruptible Load,  <b>AND</b> firm native Demand had previously been interrupted due to the sudden onset nature of the emergency,         </td> <td> <b>THEN release</b> the UDCs to restore appropriate amounts of firm native Demand (refer to Procedure <a href="#">E-508, Electrical System Emergency</a>).         </td> </tr> </tbody> </table>		If...	Then...	Operating Reserve is restored due to the implementation of Interruptible Load, <b>AND</b> firm native Demand had previously been interrupted due to the sudden onset nature of the emergency,	<b>THEN release</b> the UDCs to restore appropriate amounts of firm native Demand (refer to Procedure <a href="#">E-508, Electrical System Emergency</a> ).
If...	Then...					
Operating Reserve is restored due to the implementation of Interruptible Load, <b>AND</b> firm native Demand had previously been interrupted due to the sudden onset nature of the emergency,	<b>THEN release</b> the UDCs to restore appropriate amounts of firm native Demand (refer to Procedure <a href="#">E-508, Electrical System Emergency</a> ).					
7	<p><b>Restore</b> <u>all</u> firm native Demand <u>prior</u> to restoring any Interruptible Load.</p>					
8	<table border="1" style="width: 100%;"> <thead> <tr> <th style="background-color: #e0ffff;">If...</th> <th style="background-color: #e0ffff;">Then...</th> </tr> </thead> <tbody> <tr> <td>           The Stage 2 Emergency is downgraded and the Interruptible Load program is no longer needed to maintain adequate reserves,         </td> <td> <b>Direct</b> the UDC to restore all Interruptible Load.         </td> </tr> </tbody> </table>		If...	Then...	The Stage 2 Emergency is downgraded and the Interruptible Load program is no longer needed to maintain adequate reserves,	<b>Direct</b> the UDC to restore all Interruptible Load.
If...	Then...					
The Stage 2 Emergency is downgraded and the Interruptible Load program is no longer needed to maintain adequate reserves,	<b>Direct</b> the UDC to restore all Interruptible Load.					
Step	PTO/UDCs Actions					
9	<p><b>Restore</b> <u>all</u> firm native Demand <u>prior</u> to restoring any Interruptible Load (as directed by the CAISO).</p>					
10	<p><b>Restore</b> interrupted Demand in amounts and time frames as directed by the CAISO.</p>					

 <b>California ISO</b> Your Link to Power	<b>OPERATING PROCEDURE</b>	Procedure No.	E-511
		Version No.	7.0
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<b>Interruptible Load Programs</b>		<b>Distribution Restriction: NONE</b>	

#### 4. Curtailment of Interruptible Load for a Transmission Emergency

PG&E, SCE, and SDG&E Interruptible Load Programs enable reduction of Demand to mitigate a Transmission Emergency. The time required to achieve Demand reduction is extensive and its use must be appropriately anticipated.

Step	CAISO Shift Supervisor Actions					
1	<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>Non-firm Load relief is required in a particular geographic area to mitigate a localized transmission constraint or a system under-voltage condition,</td> <td><b>Request</b> UDCs to curtail only those non-firm customers within the applicable Non Firm Groups as listed in Attachment C, <a href="#">UDC Interruptible Load Curtailment Groups</a>.</td> </tr> </tbody> </table>		If...	Then...	Non-firm Load relief is required in a particular geographic area to mitigate a localized transmission constraint or a system under-voltage condition,	<b>Request</b> UDCs to curtail only those non-firm customers within the applicable Non Firm Groups as listed in Attachment C, <a href="#">UDC Interruptible Load Curtailment Groups</a> .
If...	Then...					
Non-firm Load relief is required in a particular geographic area to mitigate a localized transmission constraint or a system under-voltage condition,	<b>Request</b> UDCs to curtail only those non-firm customers within the applicable Non Firm Groups as listed in Attachment C, <a href="#">UDC Interruptible Load Curtailment Groups</a> .					
2	<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>The Transmission Emergency conditions return to acceptable limits due to the implementation of Interruptible Load, <b>AND</b> firm native Demand had previously been interrupted due to the sudden onset nature of the emergency,</td> <td><b>Release</b> UDCs to restore appropriate amounts of firm native Demand (refer to Procedure <a href="#">E-508, Electrical System Emergency</a>).</td> </tr> </tbody> </table>		If...	Then...	The Transmission Emergency conditions return to acceptable limits due to the implementation of Interruptible Load, <b>AND</b> firm native Demand had previously been interrupted due to the sudden onset nature of the emergency,	<b>Release</b> UDCs to restore appropriate amounts of firm native Demand (refer to Procedure <a href="#">E-508, Electrical System Emergency</a> ).
If...	Then...					
The Transmission Emergency conditions return to acceptable limits due to the implementation of Interruptible Load, <b>AND</b> firm native Demand had previously been interrupted due to the sudden onset nature of the emergency,	<b>Release</b> UDCs to restore appropriate amounts of firm native Demand (refer to Procedure <a href="#">E-508, Electrical System Emergency</a> ).					
3	<b>Restore <u>all</u></b> firm native Demand <b>prior</b> to restoring any Interruptible Load.					
4	<b>Direct</b> PG&E to restore all Interruptible Load.					
Step	UDC Actions					
5	<b>Restore <u>all</u></b> firm native Demand <b>prior</b> to restoring any Interruptible Load (as directed by the CAISO).					
6	<b>Restore</b> interrupted Demand in amounts and time frames as directed by the CAISO.					

	<b>OPERATING PROCEDURE</b>	Procedure No.	E-511
		Version No.	7.0
		Effective Date	4/7/09
<b>Interruptible Load Programs</b>		<b>Distribution Restriction: NONE</b>	

## Supporting Information


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### History

- The Stage 1 Flex Alert (formally known as the Voluntary Load Reduction Program) is intended to provide an additional level of Demand reduction on the system and can be implemented in real time after declaring a Stage 1 Emergency. The Stage 1 Flex Alert is administered by the state-run Flex Your Power program manager and is a purely voluntary program. The program participants are not compensated for load reduction and there is no obligation by program participants to reduce Demand by any set amount. There is no estimate of the amount of Demand relief that may be achieved under the Stage 1 Flex Alert.
  - The UDC Interruptible Load Program is a UDC program and was developed through arrangements with subscribing end-use customers taking service under special UDC tariffs approved by the California Public Utilities Commission (CPUC). These programs may be called in real time after declaring a Transmission Emergency or when a Stage 1 Emergency is imminent, or after a Stage 2 has been declared, or by the UDCs for their own purposes. The sections of this procedure that discuss the Interruptible Load Program address the general amount of its availability, as well as the process and time constraints of its implementation.
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### Affected Parties

- **Market Participants**
  - **Stage 1 Flex Alert Participants**
  - **Scheduling Coordinators**
  - **Utility Distribution Companies**
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 <b>California ISO</b> Your Link to Power	<b>OPERATING PROCEDURE</b>	Procedure No.	E-511
		Version No.	7.0
		Effective Date	4/7/09
<b>Interruptible Load Programs</b>		<b>Distribution Restriction: NONE</b>	


## Responsibilities

<b>Shift Supervisor</b>	After declaring a Warning and a Stage 1 is imminent (for those Interruptibles) or after declaring a Stage 2 (for those Interruptibles), directs implementation of the UDC Interruptible Load Program.
<b>Utility Distribution Company (UDC)</b>	After receipt of Interruptible Load requests by the CAISO, contacts Interruptible Load customers to instruct the amount of Load to be curtailed. Confirms with the CAISO the amount of Interruptible Load that is available and the expected reduction in their individual area.
<b>Interruptible Load Customers</b>	After being instructed by their UDC, reduces their Demand to the level required by their UDC contract.
<b>Stage 1 Flex Alert Participants</b>	After receiving curtailment requests from the CAISO through the <i>Flex Your Power</i> program manager, curtails their respective Loads by the amount they are willing to make available.

## References

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

CAISO Operating Procedure	<a href="#">E-502, Emergency Manual Load Shedding</a>
CAISO Operating Procedure	<a href="#">E-507, Emergency Response Team Procedure</a>
CAISO Operating Procedure	<a href="#">E-508, Electrical Emergency Plan</a>
CAISO Operating Procedure	<a href="#">E-509, Restricted Maintenance Operations</a>

	<b>OPERATING PROCEDURE</b>	Procedure No.	E-511
		Version No.	7.0
		Effective Date	4/7/09
<b>Interruptible Load Programs</b>		<b>Distribution Restriction: NONE</b>	

**Policy**


The CAISO minimum Operating Reserves will be maintained, as described in the WECC Operating Reserve requirements. In extreme cases, reserves may be forecast to drop below the WECC Operating Reserve requirement level, and it is CAISO policy to utilize the available Load Reduction Programs to avoid violation of WECC Operating Reserve requirements. If a Stage 1 Emergency is imminent, the CAISO will initiate the UDC Interruptible Load Programs that are available under a Warning Notice. It is the CAISO policy to only interrupt firm Load as the last option for maintaining minimum acceptable Operating Reserve levels.

**Definitions**

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

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

<b>UDC Interruptible Load Program</b>	Offers a near-last-resort remedy to preserve or help maintain Operating Reserves and, for the relief of transmission overloading and, in certain cases, under-voltage conditions.
<b>Voluntary Load Participant</b>	End-Use Customers who have agreed to receive reduction requests from the CAISO and reduce Loads on an uncompensated, free-will basis.


 <b>California ISO</b> Your Link to Power	<b>OPERATING PROCEDURE</b>	Procedure No.	E-511
		Version No.	7.0
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## Version History

Version	Change	By	Date
1.0	Drafted		6/2/00
2.0	Section 2.3- DRP no longer implemented as immediate. Section 2.4-removed "quickly as possible" Section 2.5-ditto Section 2.6-now requires 30 minutes notice to extend interruption duration Section 3.1-ditto		7/1/00
4.0	Added E-506, UDC Interruptible Service contents to this procedure. Added Discretionary Load curtailment Program.		7/11/01
4.1	Removed Voluntary Demand Response Program (VDRP), program ended. Added Legacy Energy Group to Attachments H and I.		7/18/01
4.2	Changed the DLCP confirmation responsibility from the Hour Ahead Desk to the Help Desk. Changed the responsibility for issuing DLCP requests from the Senior GRC to the Hour Ahead Desk.		8/2/01
5.0	Removed Demand Response Program and Discretionary Curtailment Program, program termination times were up. Removed attachments associated with these programs.		3/31/02
5.1	Annual review, no changes		4/28/04
6.0	Changed title "Load Curtailment" to "Load Reduction" and added contact information for the California Manufacturers and Technology Association		7/23/04
6.1	Annual review, information mapped.		3/1/05
6.2	Changed VLRP to "Stage 1 Flex Alert". Withdrew E-511A since the VLRP program no longer exists.		8/17/07
6.3	Annual review – no changes		6/5/08
7.0	Moved some of the interruptible load up to a Warning Notice timeframe		4/7/09

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 <b>California ISO</b> Your Link to Power	<b>OPERATING PROCEDURE</b>	Procedure No.	E-511
		Version No.	7.0
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<b>Interruptible Load Programs</b>		<b>Distribution Restriction: NONE</b>	

## Technical Review

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Reviewed By Content Expert	Signature	Date
Operations Support		4/3/09
Regional Transmission		4/7/09
Grid Ops		4/3/09
Market Ops		4/3/09
Scheduling		

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## Approval

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Approved By	Signature	Date
Director of Grid Operations		4/3/09

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## Appendix

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*Attachment B:* [UDC Interruptible Load Limitations and Conditions](#)

*Attachment C:* [UDC Interruptible Load Curtailment Groups](#)

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