


System Operating Procedures

SOP-OUTSCH.0050.0020

Perform Complex Studies

Effective Date: February 25, 2011
Revision No. 9

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1. Objective

The objective of this procedure is to perform a special complex study of the power system. This procedure documents the responsibilities of ISO New England (ISO) staff.

Compliance with this procedure is necessary to ensure the reliable operation of the power system in accordance with ISO New England Operating Procedure No. 3 - Transmission Outage Scheduling (OP-3), ISO New England Operating Procedure No. 5 - Generator and Dispatchable Asset Related Demand Maintenance and Outage Scheduling (OP-5), and ISO New England Operating Procedure No. 19 - Transmission Operations (OP-19). This procedure does not in any way change the intent of OP-3, OP-5, or OP-19 but rather is intended to clarify some of the responsibilities delegated to ISO staff by those procedures. This procedure also supports the cost-effective operation of the power system. This procedure can affect Market operation and settlement.


2. Background

Many things including system demand, generation and transmission outages, generation and load patterns, new facilities, and unusual operating configurations can affect the reliability of the power system. These same issues can also affect the cost-effective operation of the power system.

Operating guides and thermal analysis of the power system adequately address a broad range of operating conditions. However, when actual or planned operating conditions are determined to potentially exceed the capability of operating guides and thermal analysis, a special complex study should be performed. The need to perform a complex study is determined in accordance with SOP-OUTSCH.0050.0010 - Determine Study Requirements. This procedure describes how a complex study is performed.

3. Responsibilities

1. The assigned Operations Support Services (OSS) Analyst/Engineer is responsible for executing this procedure.

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4. Controls

1. Typically, ISO personnel performing a special complex study of the power system shall be authorized by one of the following OSS group personnel:
 - Director, Operations Support Services
 - Manager, Transmission Operations Technical Studies
 - Manager, Real-Time Support
2. However, special studies performed by an on-call, full-time OSS group Analyst/Engineer does not require authorization by the above listed OSS group personnel before conducting complex studies requested by the Control Room and/or Outage Coordination group.

5. Instructions

5.1 Notification and Response Time


1. The assigned staff person shall perform this procedure when requested by the Director, Operations Support Services (or designee), Manager, Transmission Operations Technical Studies, or Manager, Real-Time Support per SOP-OUTSCH.0050.0010 - Determine Study Requirements.
3. The assigned staff person shall perform the complex study:
 - A. In the case of an actual operating condition, as soon as possible.
 - B. In the case of a planned condition, in a timely manner that permits ISO to meet its various overall timing requirements.

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5.2 Conducting a Complex Study


5.2.1 Review Relevant Information

1. Prior to conducting the complex study, the Analyst/Engineer will perform the following:
 - A. Review the ISO New England Outage Application Summary Report and/or other relevant documentation.
 - B. Determine anticipated system conditions during the study period:
 - (1) System configuration.
 - (2) Generation pattern.
 - (3) System demand.
 - C. Consider the following:
 - (1) Relevant existing operating guides and their applicability under the study conditions.
 - (2) The results of previous studies.
 - (3) The extent to which the actual or planned conditions are non-typical.
 - (4) Unusual or un-modeled contingencies.
 - (5) The potential for abnormal voltage or voltage collapse.
 - (6) The potential for instability or oscillatory behavior.
 - (7) The potential for system protection problems.
 - (8) The potential for overstressing equipment due to excessive fault current duty.
 - (9) The needs of nuclear power plants.
 - (10) Review potentially limiting contingencies including source contingencies

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5.2.2 Perform Complex Study

1. The Analyst/Engineer will perform the following:
 - A. Determine the studies and analyses necessary to ensure that the power system can be reliably operated per the criteria set forth in ISO New England Operating Procedure No. 19 - Transmission Operations (OP -19), giving consideration to the following:
 - Load flow analysis
 - Contingency analysis
 - Transient stability study
 - Special protective study
 - Voltage/reactive study
 - Control system transient performance study
 - Short circuit and equipment duty study
 - B. Appropriately model anticipated conditions during the study period.
 - C. Perform the studies determined to be appropriate in Section 5.2.2.1.A utilizing the appropriate guides and tools including:
 - 1) Off-line load flow analysis and stability software such as:
 - Power System Simulator for Engineers (PSS/E)
 - 2) On-line load flow analysis software such as:
 - EMS Powerflow
 - EMS Interface Limits Calculator (ILC)
 - Study Contingency Analysis (STCA)
 - D. Determine any new or special interface limits.
 - E. If requested, have an economic analysis performed by the Operations Coordinators.

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5.3 Reporting Results

1. If appropriate, the Analyst/Engineer shall notify the Short-Term Outage Specialist designated D1 to:
 - A. Prepare an updated Generators Required for Transmission (GRT) spreadsheet to include updated limits resulting from the complex study and an explanation for the new limits.
 - B. Provide a printed copy of the updated GRT to the Security Operator along with explanation for the new limits.
 - C. Update the GRT on the RTSMDB Server and email the changes using the “GRT” email group listing in Outlook.
2. The Analyst/Engineer shall refer to SOP-RTMKTS.0125.0070 - Develop, Revise & Control Transmission Operating Guides and prepare applicable document:
 - A new operating guide
 - An interim operating guide


NOTE

There are no signoff signatures required for Develop Revise and Control Transmission Operating Guides SOP-RTMKTS.0125.0070 Attachment E - Temporary Guides Templates for an outage that does not involve any “Must-Run” or pre-contingency breaker opening.

3. If the study pertains to a transmission application, the Analyst/Engineer shall perform the following:
 - A. Refer to SOP-RTMKTS.0125.0070 - Develop Revise and Control Transmission Operating Guides Attachment E - Temporary Guides Template and perform the following:
 - (1) Fill in the required data
 - (2) Obtain the required Acknowledgement Signatures.
 - B. If the complex study that does not show a need for a “Must Run” or a pre-contingency breaker opening, attach the completed Attachment E - Temporary Guides Template document directly to the outage application.

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- C. Request the Short-Term Outage Coordinator to enter a notation in the “Notes to Participant” data field in the ISO Outage Scheduling software indicating a special study has been performed and that instructions are posted to the web or to the outage application.
- D. Post the instructions to the appropriate Company/Transmission Operator (TO) folder on the following web location:
http://isoweb.iso-ne.com/satellite/transmission_procedures/Transmission%20Outage%20Information/
- E. Email notification of the special instructions pertaining to the transmission application to the following:
 - (1) OPER - all groups
 - (2) Market Admin Grp
 - (3) Appropriate external contacts:
 - Local Control Centers (LCCs)
 - Transmission Operators (TO)
 - Others
4. If the study does not pertain to current operations or no issue is found, perform the following:
 - A. Provide email notification to the party requesting the study
 - B. Indicate the system conditions (generation dispatch, load levels, topology, etc.,) used during the study.
5. On a periodic basis, review studied conditions resulting in changes to the system and determine if they are still pertinent.
 - A. When studied conditions no longer apply, notify the appropriate parties including Operations and Market Administrators.
6. Studied conditions resulting in change to system operations shall be archived and retrievable.
7. Each study, pertaining to a transmission application that is no longer in effect, shall be purged from the server that contains the outdated TOGs.

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6. Performance Measures

This procedure is deemed to be properly followed as evidenced by the following:

Goal for Corporate performance in CPS1, CPS2 and DCS (Disturbance Control Standard) compliance met

7. References

ISO New England Operating Procedure No. 3 - Transmission Outage Scheduling (OP-3)

ISO New England Operating Procedure No. 5 - Generator and Dispatchable Asset Related Demand Maintenance and Outage Scheduling (OP-5)


ISO New England Operating Procedure No. 19 - Transmission Operations (OP-19)

SOP-OUTSCH.0050.0010 - Determine Study Requirements

SOP-RTMKTS.0125.0070 - Develop, Revise & Control Transmission Operating Guides

8. Revision History

Rev. No.	Date	Reason	Contact
A	05/24/02	Initial draft procedure	
B	07/18/02	Revised to incorporate sign off comments	
C	08/01/02	Revised per Integration Testing	
0	02/12/03	Initial procedure for SMD	Tom Dutkiewicz
1	6/16/03	Update procedure to current practice	Tad Witowski
2	11/14/03	Modified Controls and Performance Measures to align with ISO 9001 standards	Tad Witowski
3	12/16/03	Added Standing Instructions as communication method for Complex Studies and that Studies should be archived and retrievable	Tad Witowski
4	02/01/05	Updated SOP for RTO terminology	Tad Witowski
5	05/26/05	Clarify process of communicating non standard transmission application studies	Tad Witowski
6	09/20/06	Revised for ASM Phase 2	Ed Rappold
7	03/17/09	Revised for periodic review	Ed Rappold

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8	05/01/09	Globally Changed TOPs to OSS; Section 3 Corrected personnel titles; Section 4, Controls: Re-worded and corrected titles; Step 5.1.1. Reworded and corrected titles; Step 5.1.1.1. Added step to specify person responsible for directed actions (now new sub-steps); Step 5.2.2.1. Added step to specify person responsible for directed actions (now new sub-steps) Step 5.2.2.1.A. Corrected title for OP-19; Step 5.3.1. Added person responsible for directed actions; step 5.3.2. Reworded directed action; New NOTE prior to step 5.3.3 Step 5.3.3. Added person responsible for directed actions; Step 5.3.3.B. Added new step corrected name for outage software; Step 5.3.3.C. Corrected words for outage software step 5.3.3.D. Replaced monthly with Company/TO; Step 5.3.3.E. Provided definition for acronyms TO and LCC; Step 5.3.4.A. & B. Deleted both and added new step 5.3.4.A.; Step 5.3.5 and 5.3.7 Changed TOPs to OSS;	Ed Rappold
9	02/25/11	Biennial review by procedure owner; Replaced page numbering in footer with Page X of Y; Update procedure owner; Updated titles for Manager, Transmission Operations Technical Studies and Manager, Real-Time Studies; Added new 5.2.1.1.C.1); Added new 5.2.2.1.C.1) and 5.2.2.1.C.2); Modified 5.3.4	Dean LaForest

9. Attachments

None