	© ISO New England Inc. 2011	Procedure: Update EMS Network Transmission Topology
	Process Name: Maintain System Security	Revision Number: 18
	Procedure Number: RTMKTS.0060.0010	Effective Date: September 7, 2011
	Procedure Owner: Steve Gould	Valid Through: September 7, 2013
	Approved By: Director, Operations	

SOP-RTMKTS.0060.0010


Update EMS Network Transmission Topology

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1. Objective

The objective of this procedure is to:

- Enable timely, consistent and accurate updates of the Energy Management System (EMS), system topology and any related aspects of power system operation that are affected during normal operations and transitional phases of transmission projects
- Provide consistent and timely communication to various departments involved with the EMS

This procedure documents the responsibilities of ISO New England (ISO) staff. This procedure does not in any way change the intent of ISO New England Operating Procedure No. 16 - Transmission System Data (OP-16) but rather is intended to clarify responsibilities delegated to the ISO staff by OP-16.

Compliance with this procedure establishes actual transmission system and Generator/Dispatchable Asset Related Demand (DARD) data, the accuracy of which can impact system operation, security analysis, loss calculations, market operations, and multi-settlement.


2. Background

ISO is responsible for accurately maintaining a power system model for use in the EMS. This model includes topology, characteristics of the various power system facilities, and equipment ratings. Various application programs use the power system model, which include the state estimator, system security, market software and loss calculator.

Each Market Participant provides Generator/DARD data to ISO in accordance with ISO New England Operating Procedure No. 14 - Technical Requirements for Generators, Demand Resources and Asset Related Demands (OP-14) by sending an initial or revised NX-12 form to ISO NX12 Administrator, by submitting Generator/DARD offer and re-declared operating information into the markets. The metering and telemetering of each facility is integrated into the power system database and provided in accordance with ISO New England Operating Procedure No. 18 - Metering and Telemetering Criteria (OP-18).

Each transmission project has transitional states impacting the accuracy of the EMS that need to be coordinated prior to the final in-service date including: transmission lines being swapped from previous structures to new positions; jumpers or temporary connections for 345 kV lines to a substation; construction; etc. Ensuring accurate transmission topology in the EMS network model, thermal, voltage and stability limits, and consistent and timely communication to various departments involved are challenges during the various phases of each project.

3. Responsibilities

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NOTE

Any North American Electric Reliability Corporation (NERC) Certified System Operator, certified at the Reliability Coordinator (RC) level, has the authority to take action(s) required to comply with NERC Reliability Standards.

1. The Power System Modeling Management (PSMM) staff is responsible for receiving, compiling and coordinating each upcoming transmission project with each applicable:
 - Transmission Owner
 - Local Control Center (LCC)
 - Manager, PSMM
 - Control Room Operations staff member
 - Outage Coordination group member
 - Market Operations group member
 - Operations Support Services group member
2. The Manager, PSMM is responsible for responding to Attachment A - Power System Modeling Management Change Report Log.
3. The Manager, Control Room Operations is responsible for requesting new contingency definitions from the Manager, Power System Modeling Management.
4. The Generation Operator is responsible for replacing, switching to an alternate source and updating any suspect and failed SCADA value associated with an Inter-area Tie Line.
5. The Loader Operator is responsible for replacing, switching to a secondary source and updating any suspect/failed SCADA value associated with Generator/DARD.
6. The Security Operator is responsible for updating the network topology each time that the topology is changed due to switching and or equipment failure.
7. The Operations Shift Supervisor or the Senior System Operator is responsible for authorizing any transmission line Manrep using section 5.2.3.

4. Controls

- The EMS state estimator program is functioning normally with only five percent or fewer mismatched solutions
- Only NERC Certified System Operators certified at the RC level shall be allowed to take real-time actions involving system security

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5. Instructions

5.1 Perform EMS Network Model Changes


5.1.1 Correct Suspected Topology Discrepancy

1. When a System Operator or Outage Coordinator discovers a topology discrepancy that require system database modification, the System Operator or Outage Coordinator shall:
 - A. Complete and send Attachment A - Power System Modeling Management Change Report Log to the Manager, PSMM.
 - B. Contact the LCC or SCADA center System Operator and determine if the topology discrepancy can be resolved at their location.
 - C. If the topology discrepancy cannot be resolved by the LCC or SCADA center System Operator, contact the IT on call technician and determine if the topology discrepancy can be resolved at ISO.
2. The System Operators or Outage Coordinator shall contact the Manager, Control Room Operations (or designee) and request approval for a new contingency definition when both of the following conditions exist:
 - A. A transmission element is expected out of service for greater than two days.
 - B. A transmission application study result shows the need for a new contingency definition.
3. Based upon real-time reliability issues, the Manager, Control Room Operations (or designee) shall determine if there is a need for new contingency definition.

NOTE


When the new contingency is ready to be implemented in Real Time, it is **not** necessary to wait until the contingency is added to the Day Ahead Market before operations activates it in CLOGGER.

4. The Manager, Control Room Operations shall perform Step 5.5 of this procedure to determine if a new contingency definition is needed.

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**5.1.2 Implement
Typical Manreps**

1. If the change is for temporary use of a manual MW value (RTU or tie line metering malfunctions), the System Operator shall complete the applicable actions of Section 5.2.
2. To ensure accurate and consistent change with various departments, if temporary topology changes are proposed or occur (resulting from transitional states of a transmission project), the PSMM staff shall complete the applicable actions of Section 5.3.

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5.2 Use a Tie Line, Generator/DARD or Transmission Line Temporary MW Value (Manrep)

NOTE

It is critical that actual tie line and Generator/DARD MW values are represented at all times to ensure accurate State Estimator solutions and ultimately successful dispatch software solutions.

In most instances this is done automatically by the EMS from telemetered data. However, there are instances where a metering device fails or a device is manually updated by an LCC.


A Manrep should normally be used to replace a failed Generator/DARD or tie line metering device. A Manrep is not normally used to replace a transmission line MW value.

Obtaining a verbal MW value is acceptable for use to update (Manrep) the EMS when necessary. A Manrep MW value should only be used until the SCADA indication problem is corrected.

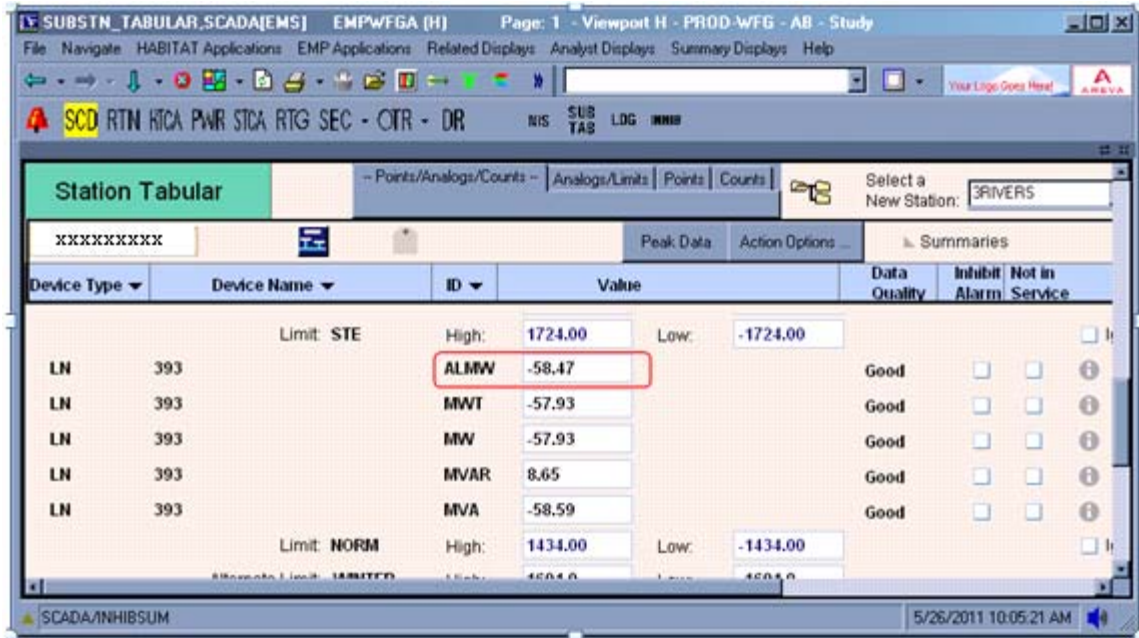
If a tie line MW value is an ISO Manrep, the corresponding tie line in the Pool Control Error Calculator (PCEC) software also must have the Manrep MW value.

5.2.1 DC and AC Tie Lines


1. If a DC tie line MW value is not accurate, or has failed the Generation Operator shall:
 - A. Contact the LCC/SCADA center involved with the SCADA MW value and determine if the problem can be resolved.
 - B. Request the involved LCC Operator/SCADA center manually enter the correct MW value into their system and verify the manually entered correct value is being used in the ISO EMS.
 - C. If the LCC Operator/SCADA center cannot manually enter a correct MW value, use Section 5.2.4 to Manrep the ISO EMS one line SCADA display MW value.
 - D. Contact the IT on call and:
 - (1) Report the problem and actions taken.
 - (2) Direct IT on call to open a Service Desk ticket.
2. If an AC tie line value is suspected of not being accurate or has failed, the Generation Operator shall:
 - A. Contact the LCC/SCADA center involved with the SCADA value and determine if the problem can be resolved.
 - B. If the SCADA problem cannot be resolved in a timely manner perform the following:

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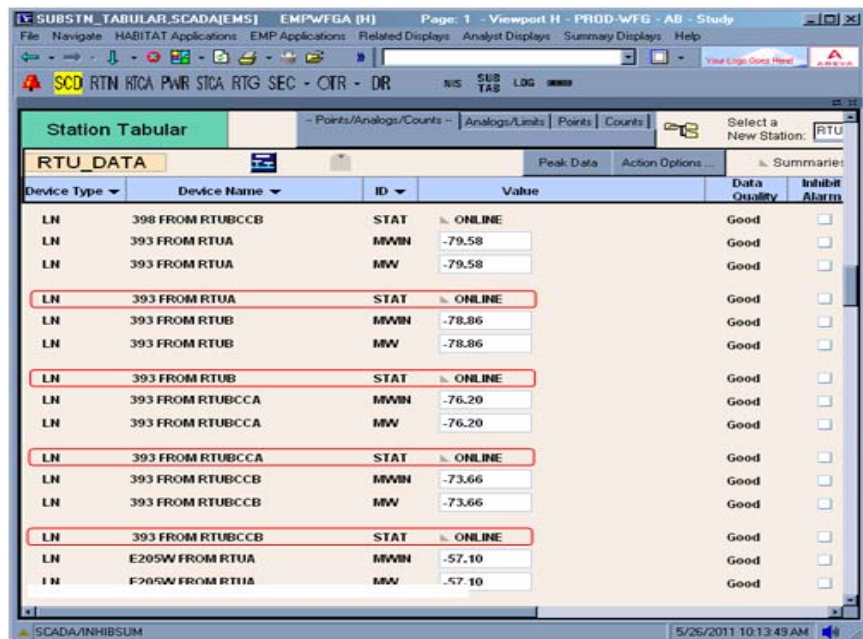
(1) Using the “Station Tabular”, verify the ALMW is tracking properly and perform the following:



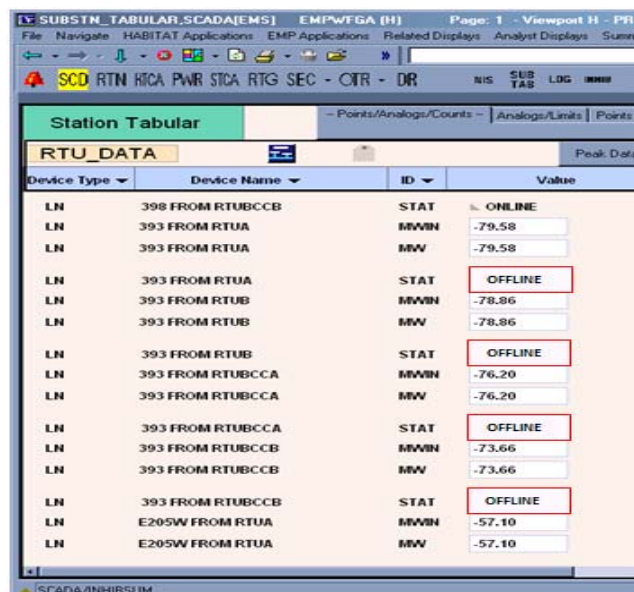
- a. Force the MW value to the ALMW by performing the following:
 - (i) Set the “Not in Service” flag on RTUA, RTUB, RTUBCCA, RTUBCCB

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- (ii) In Substation Tabular” display, go to the “Select a New Station” drop down menu and select “RTU_DATA”
- (iii) In the “RTU_DATA” station display, take the following to OFFLINE”
 - (a) RTUA
 - (b) RTUB
 - (c) RTUBCCA
 - (d) RTUBCCB



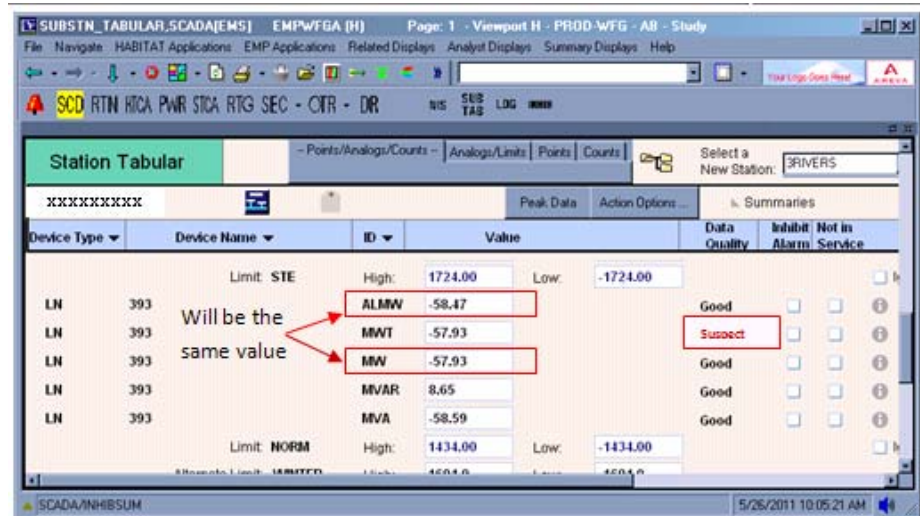
Device Type	Device Name	ID	Value	Data Quality	Inhibit Alarm
LN	398 FROM RTUBCCB	STAT	ONLINE	Good	<input type="checkbox"/>
LN	393 FROM RTUA	MWIN	-79.58	Good	<input type="checkbox"/>
LN	393 FROM RTUA	MW	-79.58	Good	<input type="checkbox"/>
LN	393 FROM RTUA	STAT	ONLINE	Good	<input type="checkbox"/>
LN	393 FROM RTUB	MWIN	-78.86	Good	<input type="checkbox"/>
LN	393 FROM RTUB	MW	-78.86	Good	<input type="checkbox"/>
LN	393 FROM RTUB	STAT	ONLINE	Good	<input type="checkbox"/>
LN	393 FROM RTUBCCA	MWIN	-76.20	Good	<input type="checkbox"/>
LN	393 FROM RTUBCCA	MW	-76.20	Good	<input type="checkbox"/>
LN	393 FROM RTUBCCA	STAT	ONLINE	Good	<input type="checkbox"/>
LN	393 FROM RTUBCCB	MWIN	-73.66	Good	<input type="checkbox"/>
LN	393 FROM RTUBCCB	MW	-73.66	Good	<input type="checkbox"/>
LN	393 FROM RTUBCCB	STAT	ONLINE	Good	<input type="checkbox"/>
LN	E205W FROM RTUA	MWIN	-57.10	Good	<input type="checkbox"/>
LN	E205W FROM RTUA	MW	-57.10	Good	<input type="checkbox"/>



Device Type	Device Name	ID	Value	Data Quality	Inhibit Alarm
LN	398 FROM RTUBCCB	STAT	ONLINE	Good	<input type="checkbox"/>
LN	393 FROM RTUA	MWIN	-79.58	Good	<input type="checkbox"/>
LN	393 FROM RTUA	MW	-79.58	Good	<input type="checkbox"/>
LN	393 FROM RTUA	STAT	OFFLINE	Good	<input type="checkbox"/>
LN	393 FROM RTUB	MWIN	-78.86	Good	<input type="checkbox"/>
LN	393 FROM RTUB	MW	-78.86	Good	<input type="checkbox"/>
LN	393 FROM RTUB	STAT	OFFLINE	Good	<input type="checkbox"/>
LN	393 FROM RTUBCCA	MWIN	-76.20	Good	<input type="checkbox"/>
LN	393 FROM RTUBCCA	MW	-76.20	Good	<input type="checkbox"/>
LN	393 FROM RTUBCCA	STAT	OFFLINE	Good	<input type="checkbox"/>
LN	393 FROM RTUBCCB	MWIN	-73.66	Good	<input type="checkbox"/>
LN	393 FROM RTUBCCB	MW	-73.66	Good	<input type="checkbox"/>
LN	393 FROM RTUBCCB	STAT	OFFLINE	Good	<input type="checkbox"/>
LN	E205W FROM RTUA	MWIN	-57.10	Good	<input type="checkbox"/>
LN	E205W FROM RTUA	MW	-57.10	Good	<input type="checkbox"/>

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- b. Return to the associated “Substation Tabular” display and verify the “AMWT” “Data Quality” is “Suspect” and the “MW” value is tracking “ALMW” value.



(2) If the “ALMW” is not tracking, perform the following:

- a. Request the associated LCC/SCADA Center System Operator manually enter the correct MW value into their system and verify the correct MW value is displayed in the ISO EMS.
- b. If the LCC/SCADA Center System Operator cannot enter a correct MW value, use section 5.2.4 and Manrep the ISO EMS one line SCADA MW value.


C. Contact the IT on call and:

- (1) Report the problem and actions taken.
- (2) Direct IT on call to open a Service Desk ticket.

3. The Generation Operator shall:

- A. Verify each Manrep value changed during the shift is updated.
- B. Notify the Operations Shift Supervisor, Senior System Operator and Security Operator of each MW value data discrepancy and the action taken.

4. For turnover purposes, the Generation Operator shall report each value Manrepped during the shift..


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NOTE

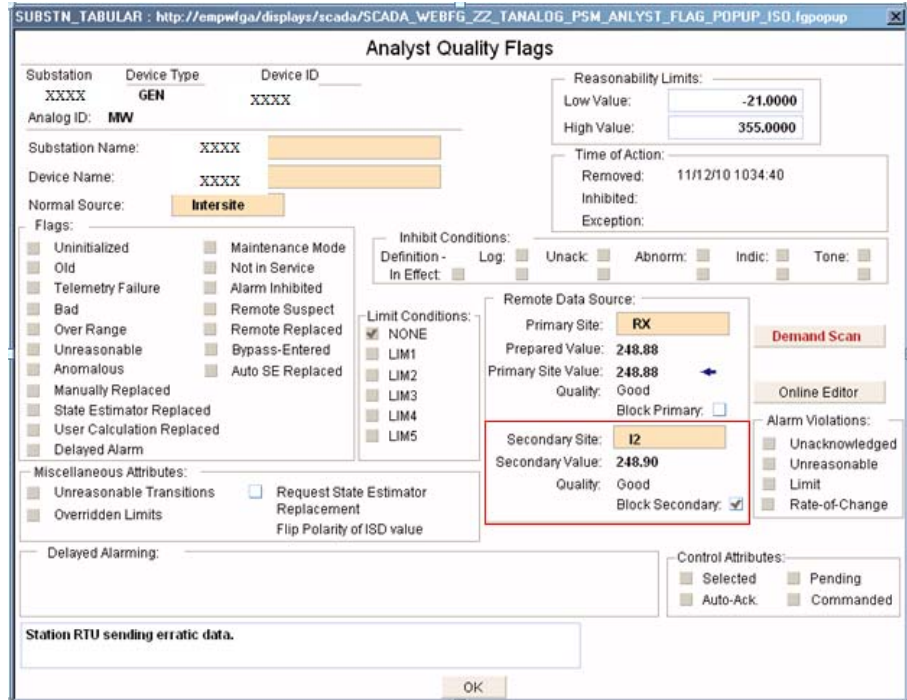
Each Manrep MW value shows up in a different color in the EMS one-line diagrams to distinguish it as a manually entered value. The frequency and amount of MW value changes required for a Manrep value should be based upon load ramps of the tie lines and Generators/DARDS involved. Not updating a Manrep value could result in erroneous results from the State Estimator.

5. When the cause for aDC or AC tie line MW value discrepancy is corrected, the Security Operator/Generation Operator shall remove the Manrep MW value or return RTUA, RTUB, RTUBCCA, and RTUBCCB to service and “On Line”.

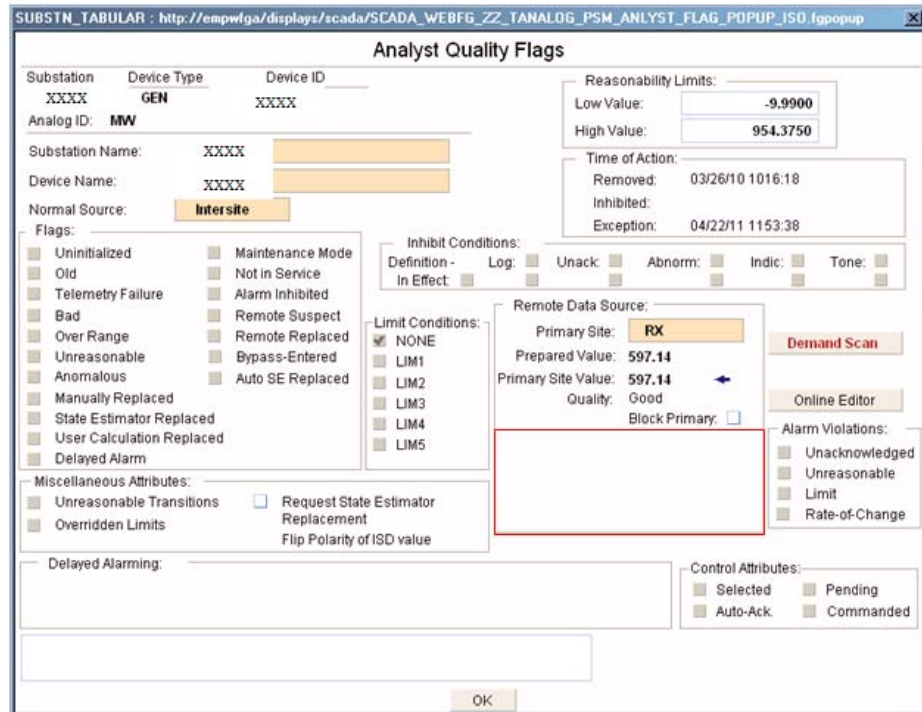
**5.2.2 Generator/
DARD**

1. If a dispatchable Generator/DARD MW SCADA value is suspected of not being accurate or has failed, the Loader Operator/Generation Operator shall:
 - A. Contact the DE and resolve the MW value SCADA problem.
 - B. If the MW value SCADA problem cannot be resolved in a timely manner the ISO System Operator shall:
 - (1) Access the “Analyst Quality Flags “display and in the “Substation Tabular” display, click on the Analyst Quality Flag icon,  .
 - (2) Use the following two (2) screenshots (#1 & #2) to determine if the valid secondary values are available
 - a. If a valid secondary source is available, use the subsequent screenshots (#3 & #4) to allow the EMS to utilize that source.
 - b. If a valid secondary source is not available, go to section 5.2.4 and Manrep the Generator/DARD MW value.


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Screenshot #1 showing the secondary source is available and good.

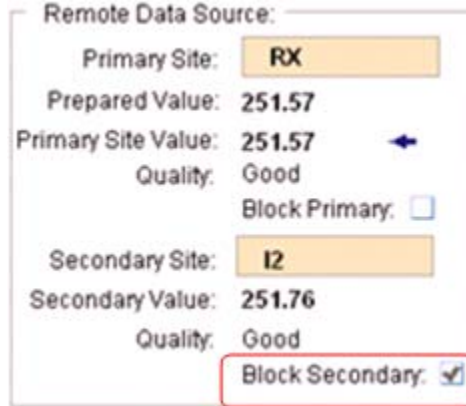


Screenshot #2 showing the secondary source not available to be used

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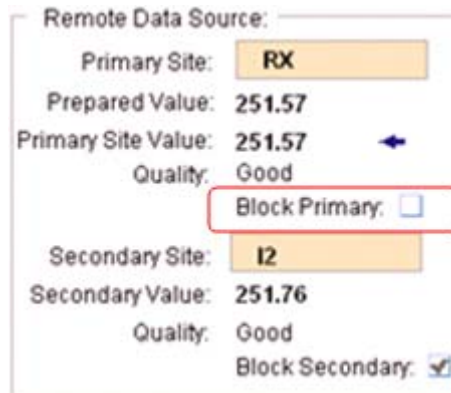
(3) If valid secondary values are available, perform the following:

a. Remove the “Block Secondary” flag.



Screenshot #3

b. Set the “Block Primary” flag “on” if the “Quality” is good but is incorrect (i.e., is frozen or has a stale value).



Screenshot #4

c. Verify that the Generator/DARD MW value is updating properly.

C. Contact the IT on call and:


(3) Report the problem and actions taken.

(4) Direct IT on call to open a Service Desk ticket.

2. The Loader Operator/Generation Operator shall:

A. Ensure each Manrep value changed to the secondary value during the shift is updated.

B. Notify the Operations Shift Supervisor, Senior System Operator and Security Operator of each MW value changed to the secondary value.

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5.2.3 Transmission Lines

1. If an internal transmission line SCADA MW value is suspected of not being accurate or has failed and is resulting in erroneous security software performance, the Security Operator shall:
 - A. Contact the applicable LCC/SCADA Center System Operator and resolve the SCADA MW value problem.
 - B. Request the associated LCC/SCADA Center System Operator manually enter the correct MW value into their system and verify the correct MW value is displayed in the ISO EMS.
 - (1) If the LCC Operator/SCADA Center System Operator cannot enter a correct value, the Security Operator shall inform the Senior System Operator and the Operations Shift Supervisor
 - (2) If required, the Senior System Operator or Operations Shift Supervisor shall authorize the use of a transmission line Manrep MW value.
 - (3) Using section 5.2.4, the Security Operator shall Manrep the transmission line MW value.
 - C. Contact the IT on call and:
 - (5) Report the problem and actions taken.
 - (6) Direct IT on call to open a Service Desk ticket.
2. The Security Operator shall verify each transmission line Manrep MW value changed during the shift is updated.
3. For turnover purposes, the Security Operator shall report each value Manrepped during the shift.


5.2.4 Manrep a MW or MVAR Value

NOTE


A Manrep value will show up in a different color in the EMS one-line diagrams to denote a manually entered value.

A MVAR value should not be changed to a Manrep value unless the suspect or failed value is causing the security software to solve incorrectly.

1. If it is required to change a SCADA MW (or MVAR) value, the applicable Control Room System Operator shall Manrep the MW (or MVAR) value as follows:
 - A. Click on the value to be changed.
 - B. Click “Remove” to open the “Display Value” well.

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- C. Enter the desired MW (or MVAR) value into the “DISPLAY VALUE” well.
- (1) If it is desired to “Manrep” the MW (or MVAR) value and the current MW (or MVAR) value matches the desired Manrep value, perform the following:
- a. First, enter a different MW (or MVAR) value in the well (e.g., a value that is +/- 1 MW from the current value).
 - b. Then, enter the desired Manrep MW (or MVAR) value.
- D. Verify the Manrep MW (or MVAR) value has turned white and is displayed on the “SCADA Manual Replaced Summary” display.
- E. If the reason for the Manrep is not obvious, enter the reason for the Manrep as a note in the “SCADA Manual Replaced Summary” display.
- F. When the condition requiring the Manrep SCADA MW (or MVAR) value no longer exists, the Security Operator shall remove the Manrep MW (or MVAR) value

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5.3 Perform EMS Network Model Release


5.3.1 Pre-Deployment Actions for EMS Model Revisions

NOTE

It is critical that the actual network topology is represented at all times to ensure successful State Estimator solutions and ultimately successful dispatch software solutions. Diagrams, limit changes, contingency definition changes, etc., corresponding to a transition state of a transmission project also need to be coordinated for accurate and consistent information for all parties.

The Manager, PSMM should have information of all transmission projects involving inter-project (transition) phases built into the EMS.

1. The PSMM staff shall compile and coordinate any upcoming transmission project information received from each applicable:
 - Transmission Owner
 - LCC
 - Generator/DARD Owner
 - Control Room Operations staff member
 - Outage Coordination group member
 - Market Operations group member
 - Operations Support Services group member
2. The PSMM staff shall compile the following items related to the inter-project (transition) phases:
 - A General list of projects involving inter-project phases
 - Details of each project along with transition diagrams
 - A list of contingencies affected
 - Status of ISO system diagram changes
 - Status of ISO limit changes
 - Status of ISO contingency definition changes
3. Approximately one month prior to release of a revised power system model the Senior Operations Engineer, working with the Manager, PSMM, shall provide an informational overview of upcoming project changes.
4. Prior to implementation of the new network model, the PSMM staff will issue Network Model Release Notes.

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5.3.2 Post-Deployment Actions for EMS Model Revisions

NOTE

EMS Model revisions may contain transmission facilities that have not gone into production but are expected to go commercial in the future. Transitions in project status once the ISO EMS model has been revised may be accomplished using the ISO Outage Scheduling software or simply through communications with the LCC. Either way requires close communication and tracking of project transitions between PSMM staff and the Short-Term Outage Group.

At the request of Operations Shift Supervisor, the PSMM Staff will be present in the Control Room during the energization of complex project sequencing.

1. When a new transmission facility goes commercial in real-time (LCC communicates a inter-project transition phase or a project completion **which does not use the ISO Outage Scheduling software**), the Control Room staff shall notify the following:
 - PSMM staff
 - Short-Term Outage Coordinator
 - Operations Support Services group
 - Market Operations
2. When a new transmission facility goes commercial in real-time (LCC communicates a inter-project transition phase or a project completion **using the ISO Outage Scheduling software**), the Short-Term Outage Coordinator shall notify the following:
 - PSMM staff
 - Control Room Operations personnel
 - Operations Support Services Group
 - Market Operations
3. PSMM staff shall verify that the related updates are available for use in Day Ahead and Real-Time:
 - New contingency definitions, if applicable
 - Powerflow basecases are updated
 - New ISO system diagrams
 - New limit changes, if applicable

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5.4 Perform Manual Topology Changes (Non Project Related)

NOTE

The Security Operator shall ensure the transmission network topology is updated with the actual topology in the field. In most instances this is done automatically by the EMS via telemetered data. However, there are instances where a device in the field is not metered or SCADA fails and the device value is Manrepped at the LCC and or ISO.


1. The Security Operator shall continuously review EMS network topology.
2. If the position indication for a breaker, line disconnect, breaker disconnect, air break, etc., (i.e., a device) in the New England system is suspect, the Security Operator shall:
 - A. Contact the LCC/SCADA Center System Operator with the suspect SCADA position indication and determine if the problem can be resolved.
 - B. Request the involved LCC Operator/SCADA Center System Operator correct the position indication problem in their system and verify the correct position indication is displayed in the ISO EMS.
 - C. If the LCC Operator/SCADA center cannot correct the position indication problem, Manrep the device indication in the ISO EMS one line SCADA display as follows:




NOTE


Normal SCADA position status indication can be ascertained by left clicking on a SCADA device and viewing the “RAW/ICCP Status” in the pop-up.

A “RAW/ICCP Status” indication of “between” will likely need the guidance contained in step 5.4.3 to correct the indication problem.

- (1) Click on the device to be Manrepped.
- (2) Click “Remove”.
- (3) To change the device position, Click “TOGGLE”
 - a. If the desired position indication matches the current position indication, perform the following:
 - (i) Toggle the device to the opposite position.
 - (ii) Toggle the device back to the desired position.

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- (4) To ensure the Manrep was successfully performed, verify the following conditions exist:
- a. The “diamond” associated with the device position indication is solid white.
 - b. The device is listed on the “SCADA Manual Replace Summary” display
 - (i) If the reason for the Manrep is not obvious, enter a reason as a note.
- D. Contact the IT on call and:
- (1) Report the problem and actions taken.
 - (2) Direct IT on call to open a Service Desk ticket.
3. If the position indication for a breaker, line disconnect, breaker disconnect, air break, etc., (i.e., a device) cannot be changed and has a “RAW/ICCP Status” indication of “between”, perform the following:
- A. On the custom menu bar, click on 
 - B. On the custom menu bar, click on 
 - C. Select the “Status” tab.
 - D. Click on  and select the appropriate substation.
 - E. Uncheck the “Enable” box associated with the device.
 - F. Toggle both the “Estimated Status” and “SCADA Status” to obtain the desired position indication.
 - (1) To ensure the Manrep was successfully performed, verify the following conditions exist:
 - a. The “diamond” associated with the device position indication is solid white.
 - b. The device is listed on the “SCADA Manual Replace Summary” display
 - (i) If the reason for the Manrep is not obvious, enter a reason as a note.


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- G. Contact the IT on call and:
 - (1) Report the problem and actions taken.
 - (2) Direct IT on call to open a Service Desk ticket.

- 4. The Security Operator shall:
 - A. Verify each position indication Manrep changed during the shift is updated.
 - B. Notify the Operations Shift Supervisor and Senior System Operator of the suspect position indication and the corrective actions taken.

- 5. At turnover, the Security Operator shall report each device position indication Manrep during the shift..

- 6. When a normal device position indication is available, the Security Operator shall remove the Manrep.


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5.5 Determine and Deploy Short Notice Contingency Definitions

1. The Manager, Control Room Operations shall request a meeting with the Manager, Power System Modeling Management, Market Operations and other IT support personnel to define the contingency definition and determine the following:
 - Whether the contingency definition is necessary
 - Whether the contingency definition should be deployed into the Day Ahead model
 - The schedule for implementation into the Real-Time and or Day Ahead model
 - Any restrictions on binding the contingency in Real Time
2. The Manager, PSMM shall notify the Manager, Control Room Operations and Market Operations when the contingency definition is deployed into the Real-Time and Day Ahead models.
3. The Manager, Control Room Operations shall notify the System Operators of any restrictions on binding the new contingency definition in CLOGGER.

NOTE

The new contingency definition may be deployed in the Real-Time model prior to the Day Ahead model. It is at the discretion of the Manager, Control Room Operations to not allow use of the contingency definition in the Real Time model until notification by IT of deployment in the Day Ahead model.

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6. Performance Measures

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

- The EMS state estimator program solves successfully greater than 95% of the time.

7. References

ISO New England Operating Procedure No. 16 - Transmission System Data (OP-16)

ISO New England Operating Procedure No. 18 - Metering and Telemetry Criteria (OP-18)


ISO New England Operating Procedure No. 14 - Technical Requirements for Generators, Demand Resources and Asset Related Demands (OP-14)

SOP-OUTSCH.0050.0020 - Perform Complex Studies


SOP-RTMKTS.0125.0040 - Update Control Room Logs

8. Revision History

Rev. No.	Date	Reason	Contact
0	02/13/03	Initial procedure for SMD	Don Gates
1	06/11/03	Update procedure to current practice	Don Gates
2	11/16/03	Modified Controls and Performance Measures to align with ISO 9001 standards	Don Gates
3	01/23/04	Added note that Any Control Room Operator has the authority to take action(s) required to comply with NERC Policy.	Don Gates
4	02/01/05	Updated SOP for RTO terminology	Steve Weaver
5	07/18/05	Clarify use of temporary and weather sensitive ratings	Steve Weaver
6	10/14/05	Added section for defining new contingency definitions and how they are deployed	Steve Weaver
7	03/09/06	Clarified Manrep section tasks, clarified that Short term Outage Coordinator supplies temp ratings to Control Room, clarified line flow MW manreps only apply to tie lines, and added steps to coordinate transmission project changes that affect the EMS	Steve Weaver
8	05/09/06	Responded to CAPA issue 05-370, if network model changes affect ILC then ensure necessary GRT changes are made	Steve Weaver
9	07/06/06	Clarified expected communications for temporary limits between Outage Coordination, Power System Modeling and Security Operator	Steve Weaver

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10	09/25/06	Revised for ASM Phase 2 to include DARDs	Steve Weaver
11	10/04/07	Minor clerical revisions resulting from annual review	Steve Weaver
12	04/30/20 08	Annual Review by Procedure Owner. Added new NOTE prior to step 5.1.1.4.B. Modified steps 5.7.1 and 5.7.3 Modified NOTE at end of step 5.7	Steve Weaver
13	11/25/20 08	Changed "Review Due Date" to "Valid Through: mm/dd/yyyy (24 months from effective date) Various changes to: correct misuse of Resources; use defined acronyms; consistent use of terms; & minor editorial / format changes; latest organizational changes Changed Outage Scheduler to ISO Outage Scheduling software in step 5.5.1.5; NOTE prior to step 5.5.1.6; NOTE prior to step 5.5.2.1; step 5.5.2.1; step 5.5.2.2	Steve Weaver
14	02/09/09	Revised to incorporate name/title changes, added time limit in 5.3.3 Note, 5.5.2 Note to have PSMM in CR for energization of complex project sequencing	Steve Weaver
15	07/28/09	Added the NOTE to Attachment B	Steve Weaver
16	02/16/10	Modified the Header copyright date and the Approved By: title; Modified Section 3 Responsibilities NOTE to include a requirement for certification at the RC level; Modified Section 4 to reflect the above RC level requirement; Added a new 3 rd paragraph and bullets to the 5.3 NOTE	Steve Weaver
17	10/25/10	Biennial review by procedure owner; Footer changed page number format to Page X of Y; Modified Section 1 1 st bullet and deleted 3 rd & 4 th bullet; Deleted 2 nd paragraph in Section 2; Section 3 Modified NOTE, defined acronym LCC, deleted former steps 3.3, 3.5, & 3.6 and modified former step 3.6; Modified title of Section 5.1.1, modified 5.1.1.1, 5.1.1.2 & sub-steps, and corrected referred to step in 5.1.1.2.C; Section 5.1.2 deleted steps 5.1.2.1 & 5.1.1.2.C, modified former step 5.1.2.4; , made grammar changes in remaining steps Deleted former Section 5.2 & 5.3; New Section 5.2 NOTE added new last paragraph; Modified steps 5.2.1, 5.2.2. & 5.2.3, following NOTE & step 5.2.4 Modified section 5.3.1 (use of PSMM); Steps 5.4.1, 5.4.4, 5.4.5, 5.4.6 & 5.4.7 Modified all steps and sub-steps, and the NOTE; Section 7 deleted OP-19 from list; Section 9 deleted Att B title from list; Deleted Attachment B	Steve Weaver

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Rev. No.	Date	Reason	Contact
18	09/07/11	<p>Updated Procedure Owner and performed Biennial Review;</p> <p>Sections 1 & 2 minor editorial and grammar changes;</p> <p>Section 3 3.4 through 3.7 added specific responsibilities to conform to actual practice;</p> <p>Step 5.1.1.1.B removed the logging requirement that is not done or needed to be done;</p> <p>Step 5.1.1.2 through 5.1.1.4 corrected the outlinging to improve formatting;</p> <p>Step 5.1.2.1 changed the language to be correct and consistent;</p> <p>Section 5.2 broke out section 5.2 into 5.2.1 through 5.2.4 and added language to all sections to provide actual procedural directed actions with display screenshots required for consistent competent task performance;</p> <p>Section 5.4 modified, removed and added language to provide actual directed actions with icon screenshots required for consistent competent task performance;</p> <p>Section 6, reworded to clarify the measurement requirement.</p>	Steve Gould

9. Attachments

Attachment A - Power System Modeling Management Change Report Log

