

Subject: **OPERATION OF INTER-UTILITY TRANSMISSION FACILITIES**

TABLE OF CONTENTS

REFERENCES	2
SCOPE	2
PROCEDURE	2

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Subject: **OPERATION OF INTER-UTILITY TRANSMISSION FACILITIES**

1. REFERENCES

- 1.1. ISO New England Operating Procedure No. 1 – Central Dispatch Operating Responsibility and Authority, ISO New England, the Local Control Centers and Market Participants (OP 1)
- 1.2. ISO New England Operating Procedure No. 3 – Transmission Outage Scheduling
- 1.3. ISO New England Operating Procedure No. 19 – Transmission Operations
- 1.4. ISO-New England Master/Local Control Center Procedure No. 18 – System Restoration Plan, Attachment D
- 1.5. New England Control Center/REMVEC Operating Procedure 98A – Helicopter Patrol Notifications
- 1.6. New England Control Center/REMVEC Operating Procedure 98 - General Procedures for Transmission Line Patrols
- 1.7. National Grid EOP G014 Clearance and Control

2. SCOPE

- 2.1. This operating procedure describes the operation of transmission facilities where inter-utility coordination is required. Activities such as long and short-term outage planning, isolating and tagging of equipment, reactive resource dispatch and line patrols are described in this Operating Procedure. Transmission facilities common to the New England Control Center/REMVEC, PSNH, VELCO, CONVEX, NSTAR and Transenergie Hydro-Quebec are included in this procedure. A list of these facilities is included in Appendix A.

3. PROCEDURE

3.1. Outage Planning

- 3.1.1. Transmission outages for construction, testing, maintenance, and repairs must be coordinated with neighboring utilities to ensure reliability is maintained at levels described in ISO-NE Operating Procedure 19.
- 3.1.2. In accordance with ISO-NE Operating Procedure 3, the New England Control Center/REMVEC shall submit outage applications with the appropriate lead times to ISO-NE. When scheduling an inter-utility transmission facility the New England Control Center/REMVEC

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Subject: **OPERATION OF INTER-UTILITY TRANSMISSION FACILITIES**

Application Coordinator shall notify all connected utilities affected by the outage. Every effort should be made to coordinate routine maintenance and repairs with other utilities to maintain a high level of reliability as well as availability of transmission facilities.

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Subject: **OPERATION OF INTER-UTILITY TRANSMISSION FACILITIES**

3.1.3. When making a transmission outage application for facilities described in Appendix A of this document, the Application Coordinator shall notify all connected utilities affected by the outage. Arrangements for switching should be made at the time of notification. If an outage must be cancelled or rescheduled, the Application Coordinator must promptly notify all affected utilities and the Outage Coordinator. The Outage Coordinator will notify ISO-NE. Rescheduling of switching activities should be discussed at this time.

3.1.4. When receiving a transmission outage application from a neighboring utility, switching arrangements will be made by the Application Coordinator. The Outage Coordinator shall review the application and notify appropriate department personnel to determine if National Grid has any work to be done on the facility. On the workday prior to the planned outage the National Grid Application Coordinator shall check with the appropriate utility to confirm the outage will occur. If the outage is cancelled or postponed the Application Coordinator shall notify appropriate departments to cancel or reschedule switching personnel.

3.2. Unplanned and Emergency outages

3.2.1. It is the responsibility of the Security Operator to notify and coordinate unplanned and emergency outages. Notification of an impending unplanned outage should be made to affected utilities at the first possible opportunity. In any case, outages must be coordinated to ensure reliability is maintained, meeting ISO-NE Operating Procedure 19 criteria. An operating plan for contingency protection must be determined at the first possible opportunity. This may include re-dispatch of generation and/or planning for shedding firm load.

Subject: **OPERATION OF INTER-UTILITY TRANSMISSION FACILITIES**

3.2.2. When receiving notification from a neighboring utility of the need to remove a facility from service, the Security Operator shall study the effect of the outage using power-flow analysis. Switching personnel should be arranged promptly and switching procedures reviewed by the System Operator.

3.3. Outages affecting Generating Facilities

3.3.1. When possible, transmission facilities which result in constrained generation should be scheduled to coincide with generator outages. Transmission facility outages which require must run-generation must be scheduled when necessary generators are available.

3.4. Switching and Tagging

3.4.1. Municipals

3.4.1.1. Municipals are responsible for switching in accordance with their company procedures and rules.

3.4.2. NATIONAL GRID

3.4.2.1. Switching and tagging of transmission facilities shall be completed in accordance with the National Grid EOP G014 Clearance and Control **Section 2.10. "Interconnections with other Utilities and Generators"**.

3.4.2.2. When foreign utilities or generators require a Guarantee

3.4.2.2.1. A designee of the foreign utility or generator, acting as their System Operator shall be issued a Guarantee by the National Grid System Operator.

3.4.2.2.2. A Red Tag shall be used to tag all protective devices listed on the Guarantee.

Subject: **OPERATION OF INTER-UTILITY TRANSMISSION FACILITIES**

3.4.2.2.3. The Guarantee shall have a number issued by the National Grid System Operator.

3.4.2.2.4. The National Grid System Operator issuing the Guarantee shall record the name and contact number of the System Operator of the foreign utility or generator.

3.4.2.2.5. Grounds may be applied at the request of the foreign System Operator. The foreign utility or generator system operator will be advised by the National Grid System Operator that the grounds installed are only a visible indication that the line/apparatus has been de-energized at the point of grounding, and should not be considered protection for their workers.

3.4.2.3. When National Grid requires isolation from a foreign utility or generators

3.4.2.3.1. A National Grid System Operator will accept the foreign utility's or generator's isolation practices as defined by their rules or will direct a National Grid switch person to red tag the required limits for the Clearance. These limits shall be tagged only after a visual open has been created by the foreign utility or generator.

3.4.2.3.2. The National Grid System Operator shall document the limit(s) as part of the zone of protection in the Clearance to be issued to the National Grid Clearance Person(s).

3.4.2.3.3. The National Grid System Operator may request the foreign utility or generator to close mechanical grounds as part of the Clearance.

3.4.2.3.4. The Clearance shall not be released to the foreign utility or generator System Operator until after the National Grid System Operator receives the Release of Clearance from the National Grid Clearance Person.

Subject: **OPERATION OF INTER-UTILITY TRANSMISSION FACILITIES****3.4.2.4.** When a foreign utility Control Center requires an NRA Guarantee

- 3.4.2.4.1.** A designee of the foreign utility, acting as their System Operator shall be issued a NRA Guarantee by the National Grid System Operator.
- 3.4.2.4.2.** The NRA Guarantee can be issued after the reclosing control(s) and supervisory controls for a specific circuit have been placed in the non-reclose position and the necessary NRA tags placed.
- 3.4.2.4.3.** The NRA Guarantee shall have a number issued by the National Grid System Operator.
- 3.4.2.4.4.** The National Grid System Operator issuing the NRA Guarantee shall record the name and contact number of the System Operator of the foreign utility.
- 3.4.2.4.5.** The designee of the foreign utility, acting as their System Operator to whom the Non-reclose Assurance has been issued has the responsibility to inform the National Grid System Operator of any conditions that may have caused the device to operate.
- 3.4.2.4.6.** Manual reclosing shall not be performed until there is concurrence by the designee of the foreign utility, acting as their System Operator to whom the NRA Guarantee was issued and the National Grid System Operator.
- 3.4.2.4.7.** The breaker(s) or device shall not be restored to the automatic reclose position until the NRA has been released by the designee of the foreign utility, acting as their System Operator.

3.4.2.5. When National Grid requires a NRA Guarantee from a foreign utility Control Center.

- 3.4.2.5.1.** A National Grid System Operator will accept the foreign utility's Non Reclosing practices as defined by their rules.
- 3.4.2.5.2.** The National Grid System Operator shall document the foreign utility's device(s) placed in the necessary position to secure the NRA Guarantee.
- 3.4.2.5.3.** Manual reclosing shall not be performed until there is concurrence by the National Grid Authorized Person and the National Grid System Operator.
- 3.4.2.5.4.** The NRA Guarantee shall not be released to the foreign utility System Operator until after the National Grid System Operator

Subject: **OPERATION OF INTER-UTILITY TRANSMISSION FACILITIES**

receives a Release of the NRA from the National Grid Authorized Person.

- 3.4.2.6.** The National Grid System Operator must obtain permission from the Security Operator prior to opening any transmission path.

Subject: **OPERATION OF INTER-UTILITY TRANSMISSION FACILITIES**

3.5. Reactive Resource Dispatch

3.5.1. Responsibilities

3.5.1.1. NEW ENGLAND CONTROL CENTER/REMVEC SECURITY OPERATOR:

- 3.5.1.1.1. Coordinate the dispatch of on-line and shunt reactive resources.
- 3.5.1.1.2. Monitor voltage schedules and limits.
- 3.5.1.1.3. Monitor MVAR loadings, capabilities and reserves.
- 3.5.1.1.4. Direct switching of shunt capacitors and reactors.
- 3.5.1.1.5. Monitor MVAR flows between the AC system and HVDC facilities.
- 3.5.1.1.6. Direct line switching for reactive resource control.

3.5.1.2. NEW ENGLAND CONTROL CENTER/REMVEC SYSTEM OPERATOR AND MUNICIPALS

- 3.5.1.2.1. Switch shunts reactive resources as directed by the Security Operator.
- 3.5.1.2.2. Monitor low-side voltage and switch low side reactive resources to optimize transmission system performance while keeping low-side voltages within prescribed limits.
- 3.5.1.2.3. Recommend changes in reactive dispatch to meet local criteria.
- 3.5.1.2.4. Monitor and maintain voltage to prescribed criteria in an emergency or when the New England Control Center/REMVEC cannot be contacted.

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Subject: **OPERATION OF INTER-UTILITY TRANSMISSION FACILITIES**

3.5.1.2.5. Notify the New England Control Center/REMVEC of any change in reactive resource availability.

3.5.1.3. Generating Stations

3.5.1.3.1. Maintain voltage schedules set for the high-side of generator step-up transformers.

3.5.1.3.2. Notify the New England Control Center/REMVEC when unable to maintain prescribed voltages.

3.5.1.3.3. Notify the New England Control Center/REMVEC when changes occur in reactive capabilities of generators.

3.5.1.4. Line Patrols

3.5.1.4.1. Patrols of lines where inter-utility coordination is necessary shall be implemented in accordance with New England Control Center/REMVEC Operating Procedure 98 - General Procedures for Transmission Line Patrols and New England Control Center/REMVEC Operating Procedure 98A – Helicopter Patrol Notifications. The New England Control Center/REMVEC Operator shall notify all utilities of line patrols of facilities listed on Appendix A. Additionally, the New England Control Center/REMVEC Operator will notify Generators connected to lines being patrolled.

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326	Scobie Pond – Lawrence - Sandy Pond	345kV
394	Seabrook – W. Amesbury - Ward Hill	345kV
A253	Merrimack Autotransformer	230kV
D204	Moore – Littleton - Comerford	230kV
C203	Moore – Littleton – Comerford	230kV
I135N	Bellows Falls – Monadnock - Fitzwilliam	115kV
I135	Flagg Pd–Ashburnham–E. Winchendon-Fitzwilliam	115kV
Q195	Moore – Littleton - Whitefield	115kV
Y151	Pelham – Power St	115kV

REMVEC – VELCO

F206	Comerford – Granite	230kV
K26	Wilder – Hartford	115kV
Q117/K4	Adams – Bennington	115kV
W149/K149	Bellows Falls – Michael Ave – Ascutney – Slayton Hill	115kV

REMVEC – CONVEX

301/302	Millbury – Carpenter Hill – Ludlow	345kV
347	Killingly – Sherman Road	345kV
341	Lake Road – West Farnum	345kV
1870S	Shunock – Wood River	115kV
B128	Harriman–Montague–Webster St–Treasure Valley–Barre-Millbury	115kV
F132	Doreen – Partridge – Adams	115kV
X176	Ludlow –Thorndike - Palmer	115kV
Y177	Montague –Sherman - Harriman	115kV
1976	Scitico – West Hampden	115kV
1205	Ludlow – West Hampden	115kV

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323	Millbury #3 – West Medway	345kV
335	Auburn St – Holbrook	345kV
338	Tewksbury 22A – Woburn	345kV
342	Auburn St – Canal - Pilgrim	345kV
344	Bridgewater – West Medway	345kV
349 X&Y	Wakefield Junction – Mystic	345kV
3361	ANP Blackstone – Sherman Rd	345kV
3520	W. Medway – ANP Bellingham	345kV
356	Bridgewater – Carver	345kV
357	Millbury #3 – West Medway	345kV
D130/201-501	Millbury #2 – Hopkinton - Rocky Hill - Depot St – Milford - Medway	115kV
D156/513-507	Northboro Road – Framingham	115kV
M139/211-503	Tewksbury 22 – Woburn	115kV
N140/211-504	Tewksbury 22 – Woburn	115kV
O167/423-515	Everett – Mystic	115kV
P168/128-518	Revere – Chelsea	115kV
451-536	Holbrook – Auburn St	115kV
D21	High Hill – Bell Rock	115kV
517-524	North Quincy – Dewar St	115kV
517-525	North Quincy – Dewar St	115kV
517-532	Field Street – Edgar	115kV
517-533	Field Street – Edgar	115kV
191	Kingston – Auburn St	115kV
194	Brook St – Auburn St	115kV

NATIONAL GRID – Transenergie HYDRO QUEBEC

451/452	Sandy Pond – Radisson	450kV
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NATIONAL GRID NE-NY

E205W	Bear Swamp – Eastover Rd.	230kV
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Subject: **OPERATION OF INTER-UTILITY TRANSMISSION FACILITIES****Revision History**

Revision	Date	Reason
1	05/31/07	Added Table of Contents and changed outline format
2	10/11/07	Made corrections to Appendix A
3	12/28/07	Yearly Review, Added References. Removed references to NSTAR where appropriate
4	04/17/08	Changed Approved by and removed authorized by.
5	10/30/08	Corrected Typographical errors on tie lines page 9
6	11/19/08	Annual Review. Changed Approved by from Manager to Director. Modified the use of the terms Application Coordinator and Outage Coordinator.
	12/31/09	Annual Review no changes
	12/23/10	Annual review no changes
	12/09/11	Annual review no changes
7	12/14/2012	Annual review – updated references and Appendix A
8	11/19/2013	Annual Review – updated References and Section 3
8.1	11/25/2014	Annual review - no changes
9	11/30/2015	Annual Review – updated Reference Section and Appendix A
10	11/7/2016	Annual Review – Updated References Section, added procedure reference to line patrol section and updated Appendix A

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