
	© ISO New England, Inc. 2024	Master/LCC Procedure No. 18 – New England System Restoration Plan, Attachment P
		Revision Number: 3.5 Revision Date: May 20, 2024
Owner: System Restoration Working Group (SRWG) Chair		Approved by: M/LCC Heads
		Review Due: May 20, 2025

Attachment P – System Restoration Voltage Limits

Table of Contents

Table 1 - System Restoration Voltage Criteria	2
M/LCC 18 Attachment P Revision History	3

*This document is controlled when viewed on the ISO New England Internet web site. When downloaded and printed, this document becomes **UNCONTROLLED**, and users should check the Internet web site to ensure that they have the latest version.*

	© ISO New England, Inc. 2024	Master/LCC Procedure No. 18 – New England System Restoration Plan, Attachment P
		Revision Number: 3.5 Revision Date: May 20, 2024
Owner: System Restoration Working Group (SRWG) Chair		Approved by: M/LCC Heads
		Review Due Date: May 20, 2025


NOTE

During system restoration, system voltage deviations of up to 110% of nominal voltage can be encountered. ISO-NE and LCC System Operators will maintain system voltages within levels specified in Table 1, using strategies outlined in M/LCC 18 Attachment G System Restoration Strategies.¹

LCC	Table 1 - System Restoration Voltage Criteria ²											
	Pre-contingency						Post-contingency					
	115 kV		230 kV		345 kV		115 kV		230 kV		345 kV	
	Low voltage criteria	High voltage criteria	Low voltage criteria	High voltage criteria	Low voltage criteria	High voltage criteria	Low voltage criteria	High voltage criteria	Low voltage criteria	High voltage criteria	Low voltage criteria	High voltage criteria
CONVEX (ES)	109.0	121.0	N.A.	N.A.	328.0	362.0	105.0	121.0	N.A.	N.A.	328.0	362.0
CONVEX (UI)	109.0	121.0	N.A.	N.A.	328.0	362.0	109.0	121.0	N.A.	N.A.	328.0	362.0
Maine (CMP)	109.3	122.0	N.A.	N.A.	327.8	362.0	105.8	124.0	N.A.	N.A.	327.8	362.0
Maine (Versant Power)	109.3	122.0	N.A.	N.A.	327.8	362.0	105.8	124.0	N.A.	N.A.	327.8	362.0
New Hampshire (ES)	109.3	121.0	218.5	241.5	327.8	362.0	107.0	121.0	218.5	241.5	327.8	362.0
NGRID	109.0	121.0	218.5	241.5	328.0	362.0	103.5	121.0	207.0	241.5	310.5	362.0
NSTAR (ES)	109.3	121.0	218.5	241.5	327.8	362.0	103.5	121.0	207.0	241.5	310.5	362.0
RIE	109.0	121.0	N.A.	N.A.	328.0	362.0	103.5	121.0	N.A.	N.A.	310.5	362.0
VELCO	109.3	121.0	218.5	241.5	327.8	362.0	103.5	121.0	207.0	241.5	310.5	362.0

¹ Per NERC Operating Manual, August 2016; Electric System Restoration Reference Document-VI; Restoration of the Transmission System and System Loads (ESR-21 Approved: April 1993; Updated: July 2003: "During restoration, the bulk power system should be operated so that reasonable voltage profiles (within the range 90% to 110% of nominal) can be maintained. Where possible, voltages should be maintained at the minimum possible levels to reduce charging currents."


² These voltage criteria are "steady state" and are applied after the use of manual and automatic system adjustments on elements such as capacitors, reactors, load-tap changers and dynamic reactive power output.

	© ISO New England, Inc. 2024	Master/LCC Procedure No. 18 – New England System Restoration Plan, Attachment P
		Revision Number: 3.5 Revision Date: May 20, 2024
Owner: System Restoration Working Group (SRWG) Chair		Approved by: M/LCC Heads Review Due Date: May 20, 2025


M/LCC 18 Attachment P Revision History

Document History


Rev. No.	Date	Reason
Rev 0	03/01/13	Initial version
Rev 1	01/09/14	Annual review by Document Owner: Updated voltage criteria to reflect system restoration considerations. This revision is not a result of a BES change that necessitates a change to the implementation of the Restoration Plan and does not result in changes to roles or tasks performed by identified entities in the Plan.
Rev 1.1	12/15/14	Annual review by Document Owner requiring no changes: This revision is not a result of a BES change that necessitates a change to the implementation of the Restoration Plan and does not result in changes to roles or tasks performed by identified entities in the Plan.
Rev 1.2	10/23/15	Annual review by procedure owner requiring no changes: This revision is not a result of a BES change that necessitates a change to the implementation of the Restoration Plan and does not result in changes to roles or tasks performed by identified entities in the Plan.
Rev 1.3	09/26/16	Annual review by procedure owner requiring no changes; Made administrative changes required to publish a new Minor Revision including added required corporate document identity to all page footers; This revision is not a result of a BES change that necessitates a change to the implementation of the Restoration Plan and does not result in changes to roles or tasks performed by identified entities in the Plan.
Rev 1.4	08/14/17	Annual review by procedure owner requiring no changes; Made administrative changes required to publish a new Minor Revision; This revision is not a result of a BES change that necessitates a change to the implementation of the Restoration Plan and does not result in changes to roles or tasks performed by identified entities in the Plan.

	© ISO New England, Inc. 2024	Master/LCC Procedure No. 18 – New England System Restoration Plan, Attachment P
		Revision Number: 3.5 Revision Date: May 20, 2024
Owner: System Restoration Working Group (SRWG) Chair		Approved by: M/LCC Heads Review Due Date: May 20, 2025

Rev. No.	Date	Reason
Rev 1.5	07/24/18	Annual review by procedure owner requiring no changes; Made administrative changes required to publish the Minor Revision (including updating the Procedure Owner); This Revision is not the result of a BES change and does not necessitate a change to the implementation of the Restoration Plan and does not result in changes to roles or tasks performed by identified entities in the Plan;
Rev 2	03/27/19	Annual review by procedure owner; Updated procedure owner in all headers; Table 1, added CONVEX (UI) data row; Table 1, Replace “REMVEC” with “NGRID” and moved the NGRID data row to maintain alphabetical LCC column listing; Table 1, updated LCC column data to be consistent with current conditions; Table 1, updated post-contingent voltage criteria data to be consistent OP-19K LTEVL criteria; This Revision does not change the roles or specific tasks of one or more entities identified in the restoration plan. This Revision is not the result of any permanent BES modification that changes the ability of ISO or the LCCs to implement the restoration plan.
Rev 2.1	03/10/20	Annual review by procedure owner requiring no changes; Made administrative changes required to publish the Minor Revision; This revision is not the result of any permanent planned or unplanned BES modification; This revision does not change the ability, through roles or specific tasks of one or more entities identified in the Plan, to implement the approved Plan; This revision does not impact the ability of ISO-NE to monitor and direct restoration efforts
Rev 3	08/28/20	Annual review by Document Owner: Moved original footnote 1 content and created a note in the body of the procedure; Inserted new footnote 1; Replaced BHE/EMERA with Versant Power; modified 115kV LV criteria to 109.3kV pre-contingent and 105.8kV post-contingent; This revision is not the result of any permanent planned or unplanned BES modification; This revision does not change the ability, through roles or specific tasks of one or more entities identified in the Plan, to implement the approved Plan; This revision does not impact the ability of ISO-NE to monitor and direct restoration efforts

	© ISO New England, Inc. 2024	Master/LCC Procedure No. 18 – New England System Restoration Plan, Attachment P
		Revision Number: 3.5 Revision Date: May 20, 2024
Owner: System Restoration Working Group (SRWG) Chair		Approved by: M/LCC Heads
		Review Due Date: May 20, 2025

Rev. No.	Date	Reason
Rev 3.1	07/19/21	Annual review by procedure owner requiring no changes; This revision is not the result of any permanent planned or unplanned BES modification; This revision does not change the ability, through roles or specific tasks of one or more entities identified in the Plan, to implement the approved Plan; This revision does not impact the ability of ISO-NE to monitor and direct restoration efforts
Rev 3.2	07/14/22	Annual procedure review by owner, no intent changes required. Changed Table 1 Title; Made administrative changes required to publish the Minor Revision; This revision is not the result of a permanent planned or unplanned BES modification; This revision does not change the ability, through roles or specific tasks of one or more entities identified in the Plan, to implement the approved Plan; This revision does not impact the ability of ISO-NE to monitor and direct restoration efforts
Rev 3.3	03/01/23	Made administrative changes required to publish the Minor Revision; Aligning review due date with M/LCC18 document suite; This revision is not the result of a permanent planned or unplanned BES modification; This revision does not change the ability, through roles or specific tasks of one or more entities identified in the Plan, to implement the approved Plan; This revision does not impact the ability of ISO-NE to monitor and direct restoration efforts.
Rev 3.4	02/28/24	Annual review by procedure owner requiring no changes; Made administrative changes required to publish the Minor Revision; This revision is not the result of a permanent planned or unplanned BES modification; This revision does not change the ability, through roles or specific tasks of one or more entities identified in the Plan, to implement the approved Plan; This revision does not impact the ability of ISO-NE to monitor and direct restoration efforts.

	© ISO New England, Inc. 2024	Master/LCC Procedure No. 18 – New England System Restoration Plan, Attachment P
		Revision Number: 3.5 Revision Date: May 20, 2024
Owner: System Restoration Working Group (SRWG) Chair		Approved by: M/LCC Heads
		Review Due Date: May 20, 2025

Rev. No.	Date	Reason
Rev 3.5	05/20/24	Annual review by procedure owner; Added RIE to Table 1; Made administrative changes required to publish the Minor Revision; This revision is not the result of a permanent planned or unplanned BES modification; This revision does not change the ability, through roles or specific tasks of one or more entities identified in the Plan, to implement the approved Plan; This revision does not impact the ability of ISO-NE to monitor and direct restoration efforts.