

NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
Purpose Ensure plans, Facilities, and personnel are prepared to enable System restoration from Blackstart Resources to aenssure reliability is maintained during restoration and priority is placed on restoring the Interconnection.	Purpose The purpose of this reliability standard is to ensure plans, facilities, and personnel are prepared to enable restoration of the interconnected electric system starting from blackstart resources, to ensure reliability is maintained during restoration, and priority is placed on restoring the interconnected electric system and the interconnection in accordance with the ISO's restoration plan.	Purpose The purpose of this reliability standard is to ensure plans, facilities, and personnel are prepared to enable restoration of the interconnected electric system starting from blackstart resources, to ensure reliability is maintained during restoration, and priority is placed on restoring the interconnected electric system and the interconnection in accordance with the ISO's restoration plan.	
Applicability 4.1. Functional Entities: 4.1.1. Transmission Operators 4.1.2. Generator Operators 4.1.3. Transmission Owners identified in the Transmission Operators restoration plan 4.1.4. Distribution Providers identified in the Transmission Operators restoration plan	Applicability This reliability standard applies to: (a) the ISO; (b) the operator of a transmission facility that the ISO includes in its restoration plan and in a list published on the AESO website that the ISO may amend from time to time in accordance with the process set out in Appendix 1; (c) the operator of a generating unit that: (i) is not part of an aggregated generating facility; (ii) has a maximum authorized real power rating greater than 18 MW; and (iii) is directly connected to either the transmission system or to transmission facilities within the City of Medicine Hat; and (d) the operator of an electric distribution system that is identified in the restoration plan of an operator of a transmission facility.	Applicability This reliability standard applies to: (a) the ISO; (b) the operator of a transmission facility that the ISO includes in its restoration plan and in a list published on the AESO website that the ISO may amend from time to time in accordance with the process set out in Appendix 1; (c) the operator of a generating unit that: (i) is not part of an aggregated generating facility; (ii) has a maximum authorized real power rating greater than 18 MW; and (iii) is directly connected to either the transmission system or to transmission facilities within the City of Medicine Hat; and (d) the operator of an electric distribution system that is identified in the restoration plan of an operator of a transmission facility.	



NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
Effective Date	Effective Date	Effective Date	
See the Implementation Plan for EOP-005-3.	2019-12-01	One full calendar quarter following approval by the Commission.	
R1. Each Transmission Operator shall havedevelop and implement a restoration plan approved by its Reliability Coordinator. The restoration plan shall allow for restoring be implemented to restore the Transmission Operator's System following aDisturbance in which one or more areas of the Bulk Electric System (BES) shuts down and the use of Blackstart Resources is required to restore the shut downshutdown area to service, to a state whereby the choice of the next Load to be restored is not driven by the need to control frequency or voltage regardless of whether the Blackstart Resource is located within the Transmission Operator's System. The restoration plan shall include: [Violation Risk Factor = High] [Time Horizon = Operations Planning, Real-time Operations] 1.1. Strategies for system restoration that are coordinated with theits Reliability Coordinator's high level strategy for restoring the Interconnection. 1.2. A description of how all Agreements or mutually-agreed upon procedures or protocols for off-site power	R1 Each operator of a transmission facility must have a restoration plan approved by the ISO that allows for the restoration of the transmission facilities that it operates to a state whereby the choice of the next load to be restored is not driven by the need to control frequency or voltage, regardless of where the blackstart resource is located, following a disturbance in which: (a) one or more areas of the interconnected electric system shuts down; and (b) the use of blackstart resources is required to restore the shut-down area(s) to service. The restoration plan must include: R1.1 Strategies for system restoration that are coordinated with the ISO's restoration plan. R1.2 Intentionally left blank. R1.3 Procedures for restoring: (a) connections with other operators of transmission facilities; and (b) interconnections with any adjacent interconnected transmission operators under the direction of the ISO. R1.4 The characteristics of each blackstart resource that is connected to the transmission facilities of the operator of a transmission facility, including but not limited to the: (a) name; (b) location;	R1 Each operator of a transmission facility must have develop a restoration plan approved by the ISO that allows for the restoration of the and implement it to restore the transmission facilities that it operates to a state whereby the choice of the next load to be restored is not driven by the need to control frequency or voltage, regardless of where the blackstart resource is located, following a disturbance in which: (a) one or more areas of the interconnected electric system shuts down; and (b) the use of blackstart resources is required to restore the shut-down area(s) to service. The restoration plan must include: R1.1 setrategies for system restoration that are coordinated with the ISO's restoration plan; R1.2 intentionally left blank; R1.3 perocedures for restoring: (a) connections with other operators of transmission facilities; and (b) interconnections with any adjacent interconnected transmission operators under the direction of the ISO; R1.4 the characteristics of each blackstart resource that is connected to the transmission facilities of the operator of a transmission facility, including but not limited to the: (a) name;	Alberta Variance: In Alberta, system restoration is determined to be completed and the required implementation of the operator of transmission facilities' restoration plans to have ended when the ISO declares "system normal". The criteria for determining system normal is set out within the ISO's restoration plan.



NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
requirements of nuclear power plants,	(c) megawatt and megavar capacity; and	(b) location;	
including priority of restoration, will be	(d) type of generating unit.	(c) megawatt and megavar capacity; and	
fulfilled during System restoration.	R1.5 The identification of the initial switching	(d) type of generating unit;-	
1.3. Procedures for restoring	requirements for any facilities, operated by the	R1.5 t∓he identification of the initial switching	
interconnections with other	operator of a transmission facility, that are a	requirements for any facilities, operated by the	
Transmission Operators under the	part of the cranking paths identified in the ISO 's restoration plan.	operator of a transmission facility, that are a part	
direction of theits Reliability Coordinator.	R1.6 Acceptable operating voltage and	of the cranking paths identified in the ISO 's	
1.4. Identification of each Blackstart	frequency limits during restoration.	restoration plan; R1.6 aAcceptable operating voltage and frequency	
Resource and its characteristics including	R1.7 Operating processes to reestablish connections between the transmission	limits during restoration:	
but not limited to the following: the	facilities of the operator of a transmission	R1.7 Operating processes to re-establish	
name of the Blackstart Resource,	facility for areas that have been restored and	connections between the transmission facilities of the operator of a transmission facility for areas	
location, megawatt and megavar	are prepared for reconnection.	that have been restored and are prepared for	
capacity, and type of unit.	R1.8 Operating processes to restore loads required to restore the interconnected electric	reconnection:	
1.5. Identification of Cranking Paths and	system, such as:	R1.8 Operating processes to restore loads	
initial switching requirements between	(a) station service for substations;	required to restore the interconnected electric system , such as:	
each Blackstart Resource and the unit(s)	(b) generating units to be restarted or	(a) station service for substations;	
to be started.	stabilized; and	(b) generating units to be restarted or stabilized;	
1.6. Identification of acceptable operating	(c) load needed to stabilize generation and	and	
voltage and frequency limits during	frequency, and to provide voltage control.	(c) load needed to stabilize generation and	
restoration.	R1.9 Operating processes for accepting authority	frequency, and to provide voltage control; and-	
1.7. Operating Processes to reestablish	from and transferring authority back to the ISO in	740 0 11 1 1 1 1	
connections within the Transmission	accordance with the ISO 's restoration plan.	R1.9 Operating processes for accepting authority operations from and transferring authority	
Operator's System for areas that have		operations back to the ISO in accordance with the	
been restored and are prepared for		ISO's restoration plan.	
reconnection.			
1.8. Operating Processes to restore Loads			
required to restore the System, such as			
station service for substations, units to			
be restarted or stabilized, the Load			
needed to stabilize generation and			



NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
frequency, and provide voltage control. 1.9. Operating Processes for transferring authority operations back to the Balancing Authority in accordance with theits Reliability Coordinator's criteria. M1. Each Transmission Operator shall have a dated, documented System restoration plan developed in accordance with Requirement R1 that has been approved by its Reliability Coordinator as shown with the documented approval from its Reliability Coordinator and will have evidence, such as operator logs, voice recordings or other operating documentation, voice recordings or other communication documentation to show that its restoration plan was implemented for times when a Disturbance has occurred, in accordance with Requirement R1.	MR1 Evidence of having a restoration plan that is approved by the ISO and includes the elements as required in requirement R1 exists. Evidence may include, but is not limited to: (a) email, mail or other equivalent evidence demonstrating approval of the restoration plan by the ISO; and (b) a documented restoration plan including the elements identified in requirement R1.	MR1 Evidence of having developing a restoration plan that is_approved by the ISO and implementing it includes the elements as required in requirement R1 exists. Evidence of developing a restoration plan approved by the ISO may include, but is not limited to: (a) email, mail or other equivalent evidence demonstrating approval of the restoration plan by the ISO; and (b) a documented restoration plan including the elements identified in requirement R1. Evidence of implementing a restoration plan may include operator logs, voice recordings, other operating or communication documentation, or other equivalent evidence.	
R2. Each Transmission Operator shall provide the entities identified in its approved restoration plan with a description of any changes to their roles and specific tasks prior to the implementationeffective date of the plan. [Violation Risk Factor = Medium] [Time Horizon = Operations Planning]	R2 In the event of changes to the roles and specific tasks of entities identified in a restoration plan: (a) the ISO must provide the affected entities identified in its restoration plan with a description of any changes to their roles and specific tasks prior to the effective date of the plan; and (b) each operator of a transmission facility must provide the affected entities identified in its	R2 In the event of changes to the roles and specific tasks of entities identified in a restoration plan: (a) the ISO must provide the affected entities identified in its restoration plan with a description of any changes to their roles and specific tasks prior to the effective date of the plan; and (b) each operator of a transmission facility must provide the affected entities identified in its approved restoration plan with a description of their	



NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
	approved restoration plan with a description of their roles and any changes to their roles and specific tasks prior to the effective date of the plan.	roles and any changes to their roles and specific tasks prior to the effective date of the plan.	
M2. Each Transmission Operator shall have evidence such as dated electronic receipts or registered mail receipts that it provided the entities identified in its approved restoration plan with a description of any changes to their roles and specific tasks prior to the effective date of the plan in accordance with Requirement R2.	MR2 Evidence of providing a description of any changes to the roles and specific tasks of affected entities identified in the restoration plan as required in requirement R2 exists. Evidence may include, but is not limited to, a documented restoration plan showing the effective date and dated emails with receipts or registered mail with receipts, including a description of any changes to roles and specific tasks, or other equivalent evidence.	MR2 Evidence of providing a description of any changes to the roles and specific tasks of affected entities identified in the restoration plan as required in requirement R2 exists. Evidence may include, but is not limited to, a documented restoration plan showing the effective date and dated emails with receipts or registered mail with receipts, including a description of any changes to roles and specific tasks, or other equivalent evidence.	
R3. Each Transmission Operator shall review its restoration plan and submit it to its Reliability Coordinator annually on a mutually-agreed, predetermined schedule.	R3 Each operator of a transmission facility must within sixty (60) days, or another time period agreed to by the ISO, after receiving an updated copy of the ISO's restoration plan:	R3 Each operator of a transmission facility must within sixty (60) days, or another time period agreed to by the ISO, after receiving an updated copy of the ISO's restoration plan:	
[Violation Risk Factor = Medium] [Time	(a) review its restoration plan;	(a) review its restoration plan;	
Horizon = Operations Planning] 3.1. If there are no changes to the previously	(b) align its restoration plan, as necessary, with the ISO 's restoration plan; and	(b) align its restoration plan, as necessary, with the ISO's restoration plan; and	
submitted restoration plan, the	(c) submit its plan to the ISO for approval.	(c) submit its plan to the ISO for approval.	
Transmission Operator shall confirm annually on a predetermined schedule to its Reliability Coordinator that it has reviewed its restoration plan and no changes were necessary. (Retirement approved by FERC effective January 21, 2014.)	R3.1 The operator of a transmission facility must, where the ISO disapproves a restoration plan submitted pursuant to requirement R3(c), resolve the issues described in the reasons provided by the ISO within a timeframe agreed to by the ISO.	R3.1 The operator of a transmission facility must, where the ISO disapproves a restoration plan submitted pursuant to requirement R3(c), resolve the issues described in the reasons provided by the ISO within a timeframe agreed to by the ISO.	
M3. Each Transmission Operator shall have documentation such as a dated review	MR3 Evidence of reviewing, aligning and submitting the restoration plan as required in requirement R3 exists. Evidence may include,	MR3 Evidence of reviewing, aligning and submitting the restoration plan as required in requirement R3 exists. Evidence may include, but is not limited to, a	



NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
signature sheet, revision histories, dated electronic receipts, or registered mail receipts, that it has annually reviewed and	but is not limited to, a documented restoration plan, including a review or revision history, and emails with receipts or registered mail with receipts, or other equivalent evidence.	documented restoration plan, including a review or revision history, and emails with receipts or registered mail with receipts, or other equivalent evidence.	
submitted the Transmission Operator's restoration plan to its Reliability Coordinator in accordance with Requirement R3.	MR3.1 Evidence of resolving the issues described in the reasons provided by the ISO within a timeframe agreed to by the ISO as required in requirement R3.1 exists. Evidence may include, but is not limited to, emails with receipts or registered mail with receipts, or other equivalent evidence.	MR3.1 Evidence of resolving the issues described in the reasons provided by the ISO within a timeframe agreed to by the ISO as required in requirement R3.1 exists. Evidence may include, but is not limited to, emails with receipts or registered mail with receipts, or other equivalent evidence.	
R4. Each Transmission Operator shall submit its revised restoration plan to its Reliability Coordinator for approval within the same 90	R4 Each operator of a transmission facility must update and submit its revised restoration plan to the ISO for approval:	R4 Each operator of a transmission facility must update and submit its revised restoration plan to the ISO for approval, when the revision would change	Alberta Variance: Amended R4(b) to require that an operator of a transmission facility submit
calendar day period., when the revision would change its ability to implement its restoration plan, as follows:	(a) within ninety (90) days after identifying an unplanned permanent interconnected electric system modification; and	its ability to implement its restoration plan, as follows: (a) within ninety (90) days after identifying an	its revised restoration plan not less than 30 days prior to implementing a planned permanent interconnected electric
[Violation Risk Factor = Medium] [Time Horizon = Operations Planning]	(b) no less than ninety (90) days prior to implementing a planned interconnected electric system modification that would change	unplanned permanent interconnected electric system modification; and (b) not less than ninety-thirty (9030) days prior to	system modification. A fixed timeline has been retained to ensure that review timelines align with those timelines
4.1. Within 90 calendar days after identifying any unplanned permanent BES modifications.	the implementation of its restoration plan. R4.1 The operator of a transmission facility	implementing a planned <u>permanent</u> interconnected electric system modification that would change the	established in requirement R5.1 in EOP- 006-AB-3. Review timelines will, however, remain subject at all times to
4.2. Prior to implementing a planned permanent BES modification subject to its Reliability Coordinator approval requirements per EOP-006.	must, where the ISO disapproves a revised restoration plan submitted pursuant to requirement R4, resolve the issues described in the reasons provided by the ISO within a timeframe agreed to by the ISO .	implementation of its restoration plan. R4.1 The operator of a transmission facility must, where the ISO disapproves a revised restoration plan submitted pursuant to requirement R4, resolve the issues described in the reasons provided by the ISO within a timeframe agreed to by the ISO.	requirement R4.1 where the ISO does not approve a submitted restoration plan.
M1.M4. Each Transmission Operator shall have documentation such as dated review signature sheets, revision histories, dated electronic receipts, or registered mail	MR4 Evidence of updating and submitting the revised restoration plan as required in requirement R4 exists. Evidence may include, but is not limited to:	MR4 Evidence of updating and submitting the revised restoration plan as required in requirement R4 exists. Evidence may include, but is not limited to:	
receipts, that it has submitted the revised restoration plan to its Reliability Coordinator	(a) for the date of identifying any unplanned permanent modifications: logs, a dated report,	(a) for the date of identifying any unplanned permanent modifications: logs, a dated report,	



NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
in accordance with Requirement R4.	emails, or other equivalent evidence; (b) for the date of implementing planned modifications: logs, a dated report, emails, or other equivalent evidence;	emails, or other equivalent evidence; (b) for the date of implementing planned modifications: logs, a dated report, emails, or other equivalent evidence;	
	(c) for updating the restoration plan: a dated documented restoration plan and revision histories, or other equivalent evidence; and	(c) for updating the restoration plan: a dated documented restoration plan and revision histories, or other equivalent evidence; and	
	(d) for submitting the revised restoration plan: emails with receipts or registered mail receipts including submission date, or other equivalent evidence.	(d) for submitting the revised restoration plan: emails with receipts or registered mail receipts including submission date, or other equivalent evidence.	
	MR4.1 Evidence of resolving the issues described in the reasons provided by the ISO within a timeframe agreed to by the ISO as required in requirement R4.1 exists. Evidence may include, but is not limited to, emails with receipts or registered mail with receipts, or other equivalent evidence.	MR4.1 Evidence of resolving the issues described in the reasons provided by the ISO within a timeframe agreed to by the ISO as required in requirement R4.1 exists. Evidence may include, but is not limited to, emails with receipts or registered mail with receipts, or other equivalent evidence.	
R5. Each Transmission Operator shall have a copy of its latest Reliability Coordinator approved restoration plan within its primary and backup control rooms so that it is available to all of its System Operators prior to its implementationeffective date. [Violation Risk Factor = Lower] [Time Horizon = Operations Planning]	R5 Each operator of a transmission facility must have a copy of its current ISO approved restoration plan within its primary and backup control rooms for the purpose of ensuring it is available to its real time operating personnel. R5.1 Each operator of a transmission facility must provide a copy of its current ISO approved restoration plan to each operator of an electric distribution system identified in that plan.	R5 Each operator of a transmission facility must have a copy of its current latest ISOapproved restoration plan within its primary and backup control roomsprior to its effective date, for the purpose of ensuring it is available to its real timereal-time operating personnel. R5.1 Each operator of a transmission facility must provide a copy of its current latest ISO_ approved restoration planprior to its effective date, to each operator of an electric distribution system identified in that plan.	Alberta Variance: Added to requirement R5.1 that the restoration plan of an operator of a transmission facility be provided to each appropriate operator of an electric distribution system prior to the effective date of the plan in order to ensure the operator of an electric distribution system has the latest ISO-approved restoration plan at all times.
M5. Each Transmission Operator shall have documentation that it has made the latest Reliability Coordinator approved copy of its	MR5 Evidence of having a copy of the current ISO approved restoration plan within the primary andbackup control rooms as required in	MR5 Evidence of having a copy of the its current latest ISO-approved restoration plan within the primary and backup control rooms and of making it	



NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
restoration plan, in electronic or hardcopy format, in its primary and backup control rooms and available to its System Operators prior to its effective date in accordance with Requirement R5.	requirement R5 exists. Evidence may include but is not limited to dated records to show that the latest ISO approved copy of the restoration plan is available in the primary and backup control rooms and to the real time operating personnel in accordance with requirement R5, or other equivalent evidence. MR5.1 Evidence of providing a copy of the current ISO approved restoration plan to each operator of an electric distribution system as required in requirement R5.1 exists. Evidence may include dated emails with receipts or registered mail receipts, or other equivalent evidence.	available to its real-time operating personnel prior to its effective date, as required in requirement R5 exists. Evidence may include but is not limited to dated records to show that the latest ISOapproved copy of the restoration plan is-was made available in the primary and backup control rooms and to the real time operating personnel in accordance withas required in requirement R5, or other equivalent evidence. MR5.1 Evidence of providing a copy of the current latest ISOapproved restoration plan to each operator of an electric distribution system prior to its effective date as required in requirement R5.1 exists. Evidence may include dated emails with receipts or registered mail receipts, or other equivalent evidence.	
R6. Each Transmission Operator shall verify through analysis of actual events, a combination of steady state and dynamic simulations, or testing that its restoration plan accomplishes its intended function. This shall be completed at least once every five years at a minimum. Such analysis, simulations or testing shall verify: [Violation Risk Factor = Medium] [Time Horizon = Longterm Planning] 6.1. The capability of Blackstart Resources to meet the Real and Reactive Power requirements of the Cranking Paths and the dynamic capability to supply initial Loads. 6.2. The location and magnitude of Loads required to control voltages and frequency within acceptable operating limits.	R6 The ISO must verify through analysis of actual events, steady state and dynamic simulations, or testing that its restoration plan accomplishes its intended function. This must be completed every five (5) years at a minimum. Such analysis, simulations or testing must verify: R6.1 the capability of blackstart resources to meet the real power and reactive power requirements of the cranking paths and the dynamic capability to supply initial loads; R6.2 the location and magnitude of loads required to control voltages and frequency within acceptable operating limits; and R6.3 the capability of generating units required to control voltages and frequency within acceptable operating limits.	R6 The ISO must verify through analysis of actual events, a combination of steady state and dynamic simulations, or testing that its restoration plan accomplishes its intended function. This must be completed at least once every five (5) calendar years at a minimum. Such analysis, simulations or testing must verify: R6.1 the capability of blackstart resources to meet the real power and reactive power requirements of the cranking paths and the dynamic capability to supply initial loads; R6.2 the location and magnitude of loads required to control voltages and frequency within acceptable operating limits; and R6.3 the capability of generating units required to control voltages and frequency within acceptable operating limits.	Alberta Variance: This requirement has been updated to align with other requirements within this standard where an event must take place once every set number of years. For greater clarity as to the computatio of time with respect to this provision, the stated number of years within the five-year cycle have been updated to calendar years.



NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
6.3. The capability of generating resources required to control voltages and frequency within acceptable operating limits.			
M6. Each Transmission Operator shall have documentation, such as power flow outputs, that it has verified that its latest restoration plan will accomplish its intended function in accordance with Requirement R6.	MR6 Evidence of verifying every five (5) years that the restoration plan accomplishes its intended function as required in requirement R6 exists. Evidence may include, but is not limited to, dated event analysis assessments, dated study results, or other equivalent evidence.	MR6 Evidence of verifying at least once every five (5) calendar years that the restoration plan accomplishes its intended function as required in requirement R6 exists. Evidence may include, but is not limited to, dated event analysis assessments, dated study results, or other equivalent evidence.	
R7. Following a Disturbance in which one or more areas of the BES shuts down and the use of Blackstart Resources is required to restore the shut down area to service, each affected Transmission Operator shall implement its restoration plan. If the restoration plan cannot be executed as expected the Transmission Operator shall utilize its restoration strategies to facilitate restoration. [Violation Risk Factor = High] [Time Horizon = Real-time Operations]	R7 Each affected operator of a transmission facility must, following a disturbance in which one or more areas of the interconnected electric system shuts down and the use of blackstart resources is required to restore the shut-down area to service, implement its restoration plan. If the restoration plan cannot be executed as expected, the operator of a transmission facility must use the strategies for system restoration referred to in requirement R1.1 to facilitate restoration.	R7 Each affected operator of a transmission facility must, following a disturbance in which one or more areas of the interconnected electric system shuts down and the use of blackstart resources is required to restore the shut-down area to service, implement its restoration plan. If the restoration plan cannot be executed as expected, the operator of a transmission facility must use the strategies for system restoration referred to in requirement R1.1 to facilitate restoration.	
	MR7 Evidence of executing the restoration plan or using the restoration strategies as required in requirement R7 exists. Evidence may include, but is not limited to, sequence of events records, data files, operator logs, voice recordings, electronic communications, or other equivalent evidence.	MR7 Evidence of executing the restoration plan or using the restoration strategies as required in requirement R7 exists. Evidence may include, but is not limited to, sequence of events records, data files, operator logs, voice recordings, electronic communications, or other equivalent evidence.	



NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
R8. Following a Disturbance in which one or more areas of the BES shuts down and the use of Blackstart Resources is required to restore the shut down area to service, the Transmission Operator shall resynchronize area(s) with neighboring Transmission Operator area(s) only with the authorization of the Reliability Coordinator or in accordance with the established procedures of the Reliability Coordinator. [Violation Risk Factor = High] [Time Horizon = Real-time Operations]	R8 Each affected operator of a transmission facility must, following a disturbance in which one or more areas of the interconnected electric system shuts down and the use of blackstart resources is required to restore the shut-down area to service, resynchronize these areas with each applicable: (a) neighbouring operator of a transmission facility's area; and (b) interconnected transmission operator's area, but only with the prior authorization of the ISO and in accordance with the procedures included in the ISO's restoration plan.	R8-Each affected operator of a transmission facility must, following a disturbance in which one or more areas of the interconnected electric system shuts down and the use of blackstart resources is required to restore the shut-down area to service, resynchronize these areas with each applicable: (a) neighbouring operator of a transmission facility's area; and (b) interconnected transmission operator's area, but only with the prior authorization of the ISO and in accordance with the procedures included in the ISO's restoration plan.	
M8. If there has been a Disturbance in which Blackstart Resources have been utilized in restoring the shut down area of the BES to service, each Transmission Operator involved in such an event shall have evidence, such as voice recordings, e-mail, dated computer printouts, or operator logs, that it resynchronized shut down areas in accordance with Requirement R8.	MR8 Evidence of resynchronizing shut down area(s) with the ISO's prior authorization and in accordance with the procedures included in the ISO's restoration plan as required in requirement R8 exists. Evidence may include, but is not limited to, a dated copy of the ISO's restoration plan and a combination of the following evidence as appropriate: (a) sequence of events records; (b) data files; (c) operator logs; (d) voice recordings; (e) electronic communications, or other equivalent evidence.	MR8 Evidence of resynchronizing shut down area(s) with the ISO's prior authorization and in accordance with the procedures included in the ISO's restoration plan as required in requirement R8 exists. Evidence may include, but is not limited to, a dated copy of the ISO's restoration plan and a combination of the following evidence as appropriate: (a) sequence of events records; (b) data files; (c) operator logs; (d) voice recordings; (e) electronic communications, or other equivalent evidence.	



NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
R9R7. Each Transmission Operator shall have Blackstart Resource testing requirements to verify that each Blackstart Resource is capable of meeting the requirements of its restoration plan. These Blackstart Resource testing requirements shall include:	R9 The ISO must have blackstart resource testing requirements to verify that each blackstart resource is capable of meeting the requirements of the ISO's restoration plan. These blackstart resource testing requirements must	R9-R7 The ISO must have blackstart resource testing requirements to verify that each blackstart resource is capable of meeting the requirements of the ISO's restoration plan. These blackstart resource testing requirements must include:	
R9R7.1. The frequency of testing such that each Blackstart Resource is tested at least once every three calendar years.	include: R9.1 The frequency of testing such that each blackstart resource is tested at least once every three (3) calendar years.	R9R7.1 The frequency of testing such that each blackstart resource is tested at least once every three (3) calendar years. R9R7.2 A list of required tests including:	
R9R7.2. A list of required tests including: R9R7.2.1. The ability to start the unit when	R9.2 A list of required tests including: (a) a test to verify the ability of the blackstart resource to:	(a) a test to verify the ability of the blackstart resource to:	
isolated with no support from the BES or when designed to remain energized without connection to the remainder of the System. R9R7.2.2. The ability to energize a bus. If it is not possible to energize a bus during the test, the testing entity must affirm that the unit has the capability to energize a bus such as verifying that the breaker close coil relay can be energized with the voltage and frequency monitor controls disconnected from the synchronizing circuits.	(i) start the generating unit(s) associated with the blackstart resource when isolated with no support from the interconnected electric system ; or (ii) remain energized without connection to the remainder of the interconnected electric system , if designed to do so; and (b) upon completion of (a), a test to verify the ability of the generating unit(s) associated with the blackstart resource to energize a bus. If it	 (i) start the generating unit(s) associated with the blackstart resource when isolated with no support from the interconnected electric system; or (ii) remain energized without connection to the remainder of the interconnected electric system, if designed to do so; and (b) upon completion of (a), a test to verify the ability of the generating unit(s) associated with the blackstart resource to energize a bus. If it is not possible to energize a bus during the test, the 	
R9R7.3. The minimum duration of each of the required tests.	is not possible to energize a bus during the test, the testing entity must otherwise demonstrate that the generating unit(s) associated with the blackstart resource has the capability to energize a bus.	testing entity must otherwise demonstrate that the generating unit(s) associated with the blackstart resource has the capability to energize a bus. R9R7.3 The minimum duration of each of the required tests.	
	R9.3 The minimum duration of each of the required tests.		
M9M7. Each Transmission Operator shall have documented Blackstart Resource testing requirements in accordance with Requirement R9R7	MR9 Evidence of having blackstart resource testing requirements as required in requirement R9 exists. Evidence may include, but is not limited to, blackstart resource testing	MR9-MR7 Evidence of having blackstart resource testing requirements as required in requirement R9 R7 exists. Evidence may include, but is not limited to, blackstart resource testing requirement	



NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
	requirement documentation, or other equivalent evidence.	documentation, or other equivalent evidence.	
R9R8 Each Transmission Operator shall include within its operations training program, annual System restoration training for its System Operators to assure the proper execution of its restoration plan. This	R10 Each operator of a transmission facility must include system restoration training for its operating personnel once each calendar year in its operations training program. This training program must include training on the following:	R408 Each operator of a transmission facility must include system restoration training for its realtime operating personnel once each calendar year in its operations training program. This training program must include training on the following:	
training program shall include training on the following: [Violation Risk Factor = Medium] [Time Horizon = Operations Planning]	(a) the operator of a transmission facility's restoration plan including coordination with the ISO and each operator of a generating unit and operator of an aggregated generating facility included in its restoration plan;	(a) the operator of a transmission facility's restoration plan including coordination with the ISO and each operator of a generating unit and operator of an aggregated generating facility included in its restoration plan;	
9.1.8.1. System restoration plan including	(b) restoration priorities;	(b) restoration priorities;	
coordination with theits Reliability Coordinator and Generator Operators	(c) the building of cranking paths as included in its restoration plan; and	(c) the building of cranking paths as included in its restoration plan; and	
included in the restoration plan. 9.2.8.2. Restoration priorities.	(d) synchronizing re-energized sections of the interconnected electric system.	(d) synchronizing re-energized sections of the interconnected electric system; and-	
 9.3.8.3. Building of cranking paths. 9.4.8.4. Synchronizing (re-energized sections of the System). 8.5. Transition of Demand and resource balance within its area to the Balancing Authority. 		(e) transition of demand and resource balance to the ISO , as applicable.	
M8. Each Transmission Operator shall have an electronic or hard copy of the training program material provided for its System Operators for System restoration training in accordance with Requirement R8.	MR10 Evidence of including system restoration training within the operations training program as required in requirement R10 exists. Evidence may include, but is not limited to, a documented operations training program including system restoration training for operating personnel, or other equivalent evidence.	MR10-MR8 Evidence of including system restoration training within the operations training program as required in requirement R10-R8 exists. Evidence may include, but is not limited to, a documented operations training program including system restoration training for real-time operating personnel, or other equivalent evidence.	
R10.R9. Each Transmission Operator, each applicable Transmission Owner,	R11 Each operator of a transmission facility and operator of an electric distribution system	R11 R9 Each operator of a transmission facility and operator of an electric distribution system	



NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
and each applicable Distribution Provider	must provide a minimum of two (2) hours of	must provide a minimum of two (2) hours of system	
shall provide a minimum of two hours of	system restoration training every two (2) calendar years to its field switching personnel identified as performing unique tasks associated	restoration training every two (2) calendar years to its field switching personnel identified as performing	
System restoration training every two		unique tasks associated with the operator of a	
calendar years to their field switching	with the operator of a transmission facility's	transmission facility's restoration plan that are	
personnel identified as performing unique	restoration plan that are outside of their normal tasks.	outside of their normal tasks.	
tasks associated with the Transmission	lasks.		
Operator's restoration plan that are outside			
of their normal tasks. [Violation Risk Factor =			
Medium] [Time Horizon = Operations			
Planning]			
M9. Each Transmission Operator, each	MR11 Evidence of providing a minimum of two	MR11-MR9 Evidence of providing a minimum of two	
applicable Transmission Owner, and each	(2) hours of system restoration training every two	(2) hours of system restoration training every two (2)	
applicable Distribution Provider shall have an	(2) calendar years as required in requirement	calendar years as required in requirement R11-R9	
electronic or hard copy of the training	R11 exists. Evidence may include, but is not limited to, training records, training	exists. Evidence may include, but is not limited to, training records, training documentation including	
program material provided to their field	documentation including dates and duration, or	dates and duration, or other equivalent evidence.	
switching personnel for System restoration	other equivalent evidence.	·	
training and the corresponding training			
records including training dates and duration			
in accordance with Requirement R9.			
R10. Each Transmission Operator shall	R12 Each operator of a transmission facility	R12 R10 Each operator of a transmission facility	
participate in its Reliability Coordinator's	must participate in the ISO's restoration drills,	must participate in the ISO 's restoration drills,	
restoration drills, exercises, or simulations as	exercises, or simulations if requested by the ISO .	exercises, or simulations if requested by the ISO .	
requested by its Reliability Coordinator.			
[Violation Risk Factor = Medium] [Time			
Horizon = Operations Planning]			
M10. Each Transmission Operator shall have	MR12 Evidence of participating in the ISO's	MR12 MR10 Evidence of participating in the ISO's	
evidence that it participated in its Reliability	restoration drills, exercises, or simulations as	restoration drills, exercises, or simulations as	
Coordinator's restoration drills, exercises, or	required in requirement R12 exists. Evidence	required in requirement R12 exists. Evidence may	
simulations as requested in accordance with	may include, but is not limited to:	include , but is not limited to :	
Requirement R10.	(1) documentation of the ISO 's request; and	(4 <u>a</u>) documentation of the ISO 's request; and	



NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
	(2) training records, participation records, training documentation, or other equivalent evidence.	(2b) training records, participation records, training documentation, or other equivalent evidence.	
R11. Each Transmission Operator and each Generator Operator with a Blackstart Resource shall have written Blackstart Resource Agreements or mutually agreed upon procedures or protocols, specifying the terms and conditions of their arrangement. Such Agreements shall include references to the Blackstart Resource testing requirements. [Violation Risk Factor = Medium] [Time Horizon = Operations Planning]	R13 The ISO must have written blackstart resource agreements or mutually agreed upon procedures or protocols with each operator of a generating unit with a blackstart resource, specifying the terms and conditions of their arrangement. Such agreements must include references to the blackstart resource testing requirements, including those specified in requirement R9.	R13-R11 The ISO must have written blackstart resource agreements or mutually agreed upon procedures or protocols with each operator of a generating unit with a blackstart resource, specifying the terms and conditions of their arrangement. Such agreements must include references to the blackstart resource testing requirements, including those specified in requirement R9R7.	
M11. Each Transmission Operator and Generator Operator with a Blackstart Resource shall have the dated Blackstart Resource Agreements or mutually agreed upon procedures or protocols in accordance with Requirement R11.	MR13 Evidence of having written blackstart resource agreements or mutually agreed upon procedures or protocols as required in requirement R13 exists. Evidence may include, but is not limited to, executed agreements, procedures or protocols, or other equivalent evidence.	MR13 MR11 Evidence of having written blackstart resource agreements or mutually agreed upon procedures or protocols as required in requirement R13 R11 exists. Evidence may include, but is not limited to, executed agreements, procedures or protocols, or other equivalent evidence.	
R13.R12. Each Generator Operator with a Blackstart Resource shall have documented procedures for starting each Blackstart Resource and energizing a bus. [Violation Risk Factor = Medium] [Time Horizon = Operations Planning]	R14 Each operator of a generating unit with a blackstart resource must have documented procedures for starting each blackstart resource and energizing a bus.	R14-R12 Each operator of a generating unit with a blackstart resource must have documented procedures for starting each blackstart resource and energizing a bus.	
M12. Each Generator Operator with a Blackstart Resource shall have dated documented procedures on file for starting each unit and energizing a bus in accordance with Requirement R12.	MR14 Evidence of having documented procedures for starting each blackstart resource and energizing a bus as required in requirement R14 exists. Evidence may include, but is not limited to, documented procedures, or	MR14 MR12 Evidence of having documented procedures for starting each blackstart resource and energizing a bus as required in requirement R14 R12 exists. Evidence may include, but is not limited to, dated documented procedures, or other	



NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
	other equivalent evidence.	equivalent evidence.	
R14.R13. Each Generator Operator with a Blackstart Resource shall notify its Transmission Operator of any known changes to the capabilities of that Blackstart Resource affecting the ability to meet the Transmission Operator's restoration plan within 24 hours following such change. [Violation Risk Factor = Medium] [Time Horizon = Operations Planning]	R15 Each operator of a generating unit with a blackstart resource must notify the ISO of any known changes to the capabilities of that blackstart resource affecting the ability of the operator of a generating unit to fulfill the requirements of the ISO's restoration plan within twenty-four (24) hours of becoming aware of such change.	R15-R13 Each operator of a generating unit with a blackstart resource must notify the ISO of any known changes to the capabilities of that blackstart resource affecting the ability of the operator of a generating unit to fulfill the requirements of the ISO's restoration plan within twenty-four (24) hours of becoming aware of such change.	
M13. Each Generator Operator with a Blackstart Resource shall provide evidence, such as dated electronic receipts or registered mail receipts, showing that it notified its Transmission Operator of any known changes to its Blackstart Resource capabilities within 24 hours of such changes in accordance with Requirement R13.	MR15 Evidence of notifying the ISO of any known changes to the capabilities of the blackstart resource as required in requirement R15 exists. Evidence may include, but is not limited to, emails with receipts, registered mail receipts, time stamped voice record(ing)s or operator logs, showing when the operator of a generating unit with a blackstart resource became aware of changes to the blackstart resource capabilities and that it notified the ISO within twenty-four (24) hours of becoming aware of such changes as required in requirement R15, or other equivalent evidence.	MR15-MR13 Evidence of notifying the ISO of any known changes to the capabilities of the blackstart resource as required in requirement R15-R13 exists. Evidence may include, but is not limited to, emails with receipts, registered mail receipts, time stamped voice record(ing)s or operator logs, showing when the operator of a generating unit with a blackstart resource became aware of changes to the blackstart resource capabilities and that it notified the ISO within twenty-four (24) hours of becoming aware of such changes as required in requirement R15, or other equivalent evidence.	
R15.R14. Each Generator Operator with a Blackstart Resource shall perform Blackstart Resource tests, and maintain records of such testing, in accordance with the testing requirements set by the Transmission Operator to verify that the	R16 Each operator of a generating unit with a blackstart resource must perform blackstart resource tests, and maintain records of such testing, in accordance with the testing requirements set by the ISO as referenced in the blackstart resource agreements or mutually agreed upon procedures or protocols.	R16-R14 Each operator of a generating unit with a blackstart resource must perform blackstart resource tests, and maintain records of such testing, in accordance with the testing requirements set by the ISO as referenced in the blackstart resource agreements or mutually agreed upon procedures or protocols.	
Blackstart Resource can perform as specified in the restoration plan. [Violation Risk Factor = Medium] [Time Horizon = Operations	R16.1 Testing records must include at a minimum: (a) name of the blackstart resource;	R16R14.1 Testing records must include at a minimum: (a) name of the blackstart resource;	



NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
Planning] 15.1.14.1. Testing records shall include at a minimum: name of the Blackstart Resource, unit tested, date of the test, duration of the test, time required to start the unit, an indication of any testing requirements not met under Requirement R9R7. 15.2.14.2. Each Generator Operator shall provide the blackstart test results within 30 calendar days following a request from its Reliability Coordinator or	Current Alberta EOP-005-AB-2 (b) generating unit tested; (c) date of the test; (d) duration of the test; (e) time required to start the generating unit; and (f) an indication of any testing requirements not met under requirement R9. R16.2 Each operator of a generating unit with a blackstart resource must provide the blackstart resource test results within thirty (30) days after receiving a request from the ISO.	New Alberta EOP-005-AB-3 (b) generating unit tested; (c) date of the test; (d) duration of the test; (e) time required to start the generating unit; and (f) an indication of any testing requirements not met under requirement R9R7. R16R14.2 Each operator of a generating unit with a blackstart resource must provide the blackstart resource test results within thirty (30) days after receiving a request from the ISO.	AESO Reason for Differences
Transmission Operator. M14. Each Generator Operator with a Blackstart Resource shall maintain dated documentation of its Blackstart Resource test results and shall have evidence such as e- mails with receipts or registered mail receipts, that it provided these records to its Reliability Coordinator and Transmission Operator when requested in accordance with Requirement R14.	MR16 Evidence of performing blackstart resource tests, maintaining records of such testing, and providing the blackstart resource test results as required in requirement R16 exists. Evidence may include, but is not limited to, test records, test results, and emails with receipts or registered mail receipts that show that it provided these records to the ISO when requested, or other equivalent evidence.	MR16-MR14 Evidence of performing blackstart resource tests, maintaining records of such testing, and providing the blackstart resource test results as required in requirement R16 exists. Evidence may include, but is not limited to, test records, test results, and emails with receipts or registered mail receipts that show that it provided these records to the ISO when requested, or other equivalent evidence.	
R16R15. Each Generator Operator with a Blackstart Resource shall provide a minimum of two hours of training every two calendar years to each of its operating personnel responsible for the startup of its Blackstart Resource generation units and energizing a bus. The training program shall include training on the following: [Violation	R17 Each operator of a generating unit with a blackstart resource must provide a minimum of two (2) hours of training every two (2) calendar years to each of its operating personnel responsible for: (a) the startup of its blackstart resource; and (b) energizing a bus. R17.1 The training program must include training	R1517 Each operator of a generating unit with a blackstart resource must provide a minimum of two (2) hours of training every two (2) calendar years to each of its operating personnel responsible for: (a) the startup of its blackstart resource; and (b) energizing a bus. R17R15.1 The training program must include	



NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
Risk Factor = Medium] [Time Horizon = Operations Planning] 16.1.15.1. System restoration plan including coordination with the Transmission Operator. 16.2.15.2The procedures documented in Requirement R14.R12	on the following: (a) those elements of the ISO's restoration plan that are applicable to the blackstart resource, including coordination with the ISO and the adjacent operator of a transmission facility; and (b) the procedures documented in requirement R14.	training on the following: (a) those elements of the ISO 's restoration plan that are applicable to the blackstart resource , including coordination with the ISO and the adjacent operator of a transmission facility ; and (b) the procedures documented in requirement R14R12.	
M15. Each Generator Operator with a Blackstart Resource shall have an electronic or hard copy of the training program material provided to its operating personnel responsible for the startup, energizing a bus and synchronization of its Blackstart Resource generation units and a copy of its dated training records including training dates and durations showing that it has provided training in accordance with Requirement R175.	MR17 Evidence of providing a minimum of two (2) hours of training every two (2) calendar years as required in requirement R17 exists. Evidence may include, but is not limited to, training records, training dates, durations and training materials provided, or other equivalent evidence.	MR17MR15_Evidence of providing a minimum of two (2) hours of training every two (2) calendar years as required in requirement R17_R15_exists. Evidence may include_, but is not limited to, training records, including training dates, and durations and, training materials provided, or other equivalent evidence. MR15.1 Evidence of including training within the training program as required in requirement R15.1 exists. Evidence may include training materials, or other equivalent evidence.	
R16. Each Generator Operator shall participate in its Reliability Coordinator's restoration drills, exercises, or simulations as requested by its Reliability Coordinator. [Violation Risk Factor = Medium] [Time Horizon = Operations Planning]	R18. Each operator of a generating unit must participate in the ISO's restoration drills, exercises, or simulations if requested by the ISO.	R16 R18. Each operator of a generating unit must participate in the ISO's restoration drills, exercises, or simulations if as requested by the ISO.	
M16. Each Generator Operator shall have evidence, such as dated training records, that it participated in theits	MR18 Evidence of participating in the ISO's restoration drills, exercises, or simulations as required in requirement R18 exists. Evidence may include, but is not limited to:	MR18MR16 Evidence of participating in the ISO's restoration drills, exercises, or simulations as required in requirement R18 R16 exists. Evidence	



NERC EOP-005-3 Red line to V2	Current Alberta EOP-005-AB-2	New Alberta EOP-005-AB-3	AESO Reason for Differences
Reliability Coordinator's restoration drills,	(1) documentation of the ISO 's request; and	may include, but is not limited to:	
exercises, or simulations if requested to do	(2) training records, participation records, training	$(\underline{a}4)$ documentation of the ISO 's request; and	
so in accordance with Requirement R186.	documentation, or other equivalent evidence.	(2b) training records, participation records, training documentation, or other equivalent evidence.	

Appendix 1

Amending Process for List of Operators of Transmission Facilities included in the AESO Restoration Plan

In order to amend the list referenced in subsection (b) of section 2, Applicability, the **ISO** must:

- (a) upon determining that an **operator** of a **transmission facility** is to be added to the list, notify each affected **operator** of a **transmission facility** in writing and determine the date on which the amended list comes into effect, which must be no less than the first day of the month following three (3) full calendar quarters (January 1, April 1, July 1, October 1) after the date of notice, for the **operator** to meet the applicable requirements;
- (b) upon determining that an **operator** of a **transmission facility** is to be deleted, notify each affected **operator** of a **transmission facility** in writing and determine the date on which the amended list comes into effect such that the **operator** will no longer be required to meet the applicable requirements; and
- (c) post the amended list with effective dates on the AESO website.