Transition of Requirements from Section 305.3 into EOP-005-AB-2 and EOP-006-AB-2

Requirements in Section 305.3 of the ISO rules, *Blackstart Restoration* ("Section 305.3")	**Corresponding Requirements in Alberta reliability standards: EOP-005-AB-2, *System Restoration from Blackstart Resources* ("EOP-005-AB-2"); *and* EOP-006-AB-2, *System Restoration Coordination* ("EOP-006-AB-2")**
Applicability **1** Section 305.3 applies to: (a) a **legal owner** of a **transmission facility**; (b) a **legal owner** of a **generating unit**; (c) a **legal owner** of an **aggregated generating facility**; and (d) the **ISO**.	**EOP-005-AB-2 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**. **EOP-006-AB-2 Applicability** This **reliability standard** applies to: (a) the **ISO**.
Contracting for Blackstart **2** The **ISO** must establish contracts with **market participants** for the provision of blackstart services.	**EOP-005-AB-2 – Requirement R13** **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.

Requirements in Section 305.3 of the ISO rules, *Blackstart Restoration* ("Section 305.3")	Corresponding Requirements in Alberta reliability standards: EOP-005-AB-2, *System Restoration from Blackstart Resources* ("EOP-005-AB-2"); *and* EOP-006-AB-2, *System Restoration Coordination* ("EOP-006-AB-2")
Blackstart Procedures **3(1)** The **ISO** must develop and maintain procedures to facilitate the restoration of the **interconnected electric system** in the event of a partial or complete blackout of the **interconnected electric system**.	**EOP-006-AB-2 – Requirement R.1** **R.1** The **ISO** must have a restoration plan for its area. The scope of the **ISO**'s restoration plan starts when contracted **blackstart resources** are utilized to re-energize a shutdown area of the **bulk electric system**. The scope of the **ISO**'s restoration plan ends when each **operator** of a **transmission facility** is interconnected and the **ISO**'s area is connected to all of its neighbouring **reliability coordinator areas**, provided facilities are available to be returned to service.
3(2) The **legal owner** of a **transmission facility** must develop and maintain procedures to facilitate restoration of its facilities in the event of a partial or complete black out of the **interconnected electric system**.	**EOP-005-AB-2 – Requirement R1** **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; (c) megawatt and megavar capacity; and (d) type of **generating unit**.

Requirements in Section 305.3 of the ISO rules, *Blackstart Restoration* ("Section 305.3")	Corresponding Requirements in Alberta reliability standards: EOP-005-AB-2, *System Restoration from Blackstart Resources* ("EOP-005-AB-2"); *and* EOP-006-AB-2, *System Restoration Coordination* ("EOP-006-AB-2")
	R1.5 The identification of the initial switching requirements for any facilities, operated by the **operator** of a **transmission facility**, that are a part of the **cranking paths** identified in the **ISO**'s restoration plan. **R1.6** Acceptable operating voltage and frequency limits during restoration. **R1.7** Operating processes to reestablish connections between the **transmission facilities** of the **operator** of a **transmission facility** for areas that have been restored and are prepared for reconnection. **R1.8** Operating processes to restore loads required to restore the **interconnected electric system**, such as: (a) station service for substations; (b) **generating units** to be restarted or stabilized; and (c) load needed to stabilize generation and frequency, and to provide voltage control. **R1.9** Operating processes for accepting authority from and transferring authority back to the **ISO** in accordance with the **ISO**'s restoration plan.
3(3) The **legal owner** of a **transmission facility** must, with respect to the procedures required under subsection 3(2): (a) ensure that they are aligned with the **ISO**'s procedures; and (b) provide them to the **ISO** on an annual basis and no later than December 31 of each year.	**EOP-005-AB-2 – Requirement R3** **R3** Each **operator** of a **transmission facility** must within sixty (60) days after receiving an updated copy of the **ISO**'s restoration plan: (a) review its restoration plan; (b) align its restoration plan, as necessary, with the **ISO**'s restoration plan; and (c) submit its plan to the **ISO** for approval.
3(4)** The **legal owner** of a **generating unit** and the **legal owner** of an **aggregated generating facility** must develop and maintain procedures to facilitate restoration of its facilities in the event of a partial or complete black out of the **interconnected electric system**.	**EOP-005-AB-2 – Requirement R14** **R14** Each **operator** of a **generating unit** with a **blackstart resource** must have documented procedures for starting each **blackstart resource** and energizing a bus. **EOP-006-AB-2 – Requirement R7** **R7.** The **ISO** must work with each affected **operator** of a **generating unit**, **operator** of an **aggregated generating facility**, and **operator** of a **transmission facility** as well as neighbouring **reliability coordinators** to monitor restoration progress, coordinate restoration, and take actions to restore the **bulk**

Requirements in Section 305.3 of the ISO rules, *Blackstart Restoration* ("Section 305.3")	Corresponding Requirements in Alberta reliability standards: EOP-005-AB-2, *System Restoration from Blackstart Resources* ("EOP-005-AB-2"); *and* EOP-006-AB-2, *System Restoration Coordination* ("EOP-006-AB-2")
	electric system frequency within acceptable operating limits. If the restoration plan cannot be completed as expected, the **ISO** must utilize its restoration plan strategies to facilitate restoration of the **interconnected electric system**. [Please see note at the bottom of this matrix for additional information associated with this requirement]
3(5)** The **legal owner** of a **generating unit** and the **legal owner** of an **aggregated generating** facility must ensure that its procedures are aligned with the procedures of the **legal owner** of a **transmission facility** with whose facilities the **generating unit** or **aggregated generating facility** is connected.	**EOP-005-AB-2 – Requirement R1** **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: […] **R1.8** Operating processes to restore loads required to restore the **interconnected electric system**, such as: (a) station service for substations; (b) **generating units** to be restarted or stabilized; and (c) load needed to stabilize generation and frequency, and to provide voltage control. [Please see note at the bottom of this matrix for additional information associated with this requirement]
Training of Blackstart Procedures **4(1)** The **ISO** must train its staff on its blackstart procedures.	**EOP-006-AB-2 – Requirement R9** **R9.** The **ISO** must include within its operations training program, annual **interconnected electric system** restoration training for its operating personnel to assure the proper execution of its restoration plan. This training program must address the following **R9.1.** the coordination role of the **ISO**; and **R9.2.** reestablishing **WECC** Paths 1 and 83.

Requirements in Section 305.3 of the ISO rules, ***Blackstart Restoration*** **("Section 305.3")**	**Corresponding Requirements in Alberta reliability standards:** **EOP-005-AB-2, *System Restoration from Blackstart Resources* ("EOP-005-AB-2"); *and*** **EOP-006-AB-2, *System Restoration Coordination* ("EOP-006-AB-2")**
4(2) The **ISO** must, on an annual basis, conduct a blackstart exercise to test its blackstart procedures.	**EOP-006-AB-2 – Requirement R10** **R10.** The **ISO** must conduct two (2) scheduled instances of a system restoration drill, exercise, or simulation per calendar year, which must provide an opportunity for each **operator** of a **transmission facility**, **operator** of a **generating unit** and **operator** of an **aggregated generating facility** to attend as dictated by the particular scope of the drill, exercise, or simulation that is being conducted. **R10.1.** The **ISO** must request each **operator** of a **transmission facility**, **operator** of a **generating unit** and **operator** of an **aggregated generating facility**, as identified in the **ISO**'s restoration plan, to participate in a drill, exercise, or simulation at least once every two calendar years.
4(3) The **legal owner** of a **transmission facility** must train its staff on its blackstart procedures.	**EOP-005-AB-2 – Requirement R10** **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: (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; (b) restoration priorities; (c) the building of **cranking paths** as included in its restoration plan; and (d) synchronizing re-energized sections of the **interconnected electric system**. **R10.1** The **ISO** must request each **operator** of a **transmission facility**, **operator** of a **generating unit** and **operator** of an **aggregated generating facility**, as identified in the **ISO**'s restoration plan, to participate in a drill, exercise, or simulation at least once every two calendar years
4(4)** The **legal owner** of a **generating unit** and the **legal owner** of an **aggregated generating facility** must train its staff on its blackstart procedures.	**EOP-005-AB-2 – Requirement R17** **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.

Requirements in Section 305.3 of the ISO rules, ***Blackstart Restoration*** **("Section 305.3")**	**Corresponding Requirements in Alberta reliability standards:** **EOP-005-AB-2, *System Restoration from Blackstart Resources* ("EOP-005-AB-2"); *and*** **EOP-006-AB-2, *System Restoration Coordination* ("EOP-006-AB-2")**
	R17.1 The training program shall include 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 R14. **EOP-005-AB-2 – Requirement R18** **R18** Each **operator** of a **generating unit** must participate in the **ISO**'s restoration drills, exercises, or simulations if requested by the **ISO**. [Please see note at the bottom of this matrix for additional information associated with this requirement]
Coordination of Blackstart Restoration Plan **5(1)** The **legal owner** of a **transmission facility**, **legal owner** of a **generating unit** and **legal owner** of an **aggregated generating facility** must only execute blackstart procedures under the **ISO**'s direction. **(2)** The **legal owner** of a **transmission facility** must coordinate blackstart restoration with the **legal owner** of a **generating unit** and **legal owner** of an **aggregated generating facility**, connected to its facility. **(3)** The **legal owner** of a **generating unit** and **legal owner** of an **aggregated generating facility** must coordinate any blackstart restoration with the **legal owner** of a **transmission facility** with whose facilities the **generating unit** or **aggregated generating facility** is connected. [Note: Section 301.2 of the ISO rules, *ISO Directives*, requires all market participants to comply with directives received from the AESO]	**EOP-005-AB-2 – Requirement R1** **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: (e) name;

Requirements in Section 305.3 of the ISO rules, *Blackstart Restoration* (“Section 305.3”)	Corresponding Requirements in Alberta reliability standards: EOP-005-AB-2, *System Restoration from Blackstart Resources* (“EOP-005-AB-2”); *and* EOP-006-AB-2, *System Restoration Coordination* (“EOP-006-AB-2”)
	(f) location; (g) megawatt and megavar capacity; and (h) type of **generating unit**. **R1.5** The identification of the initial switching requirements for any facilities, operated by the **operator** of a **transmission facility**, that are a part of the **cranking paths** identified in the **ISO**’s restoration plan. **R1.6** Acceptable operating voltage and frequency limits during restoration. **R1.7** Operating processes to reestablish connections between the **transmission facilities** of the **operator** of a **transmission facility** for areas that have been restored and are prepared for reconnection. **R1.8** Operating processes to restore loads required to restore the **interconnected electric system**, such as: (d) station service for substations; (e) **generating units** to be restarted or stabilized; and (f) load needed to stabilize generation and frequency, and to provide voltage control. **R1.9** Operating processes for accepting authority from and transferring authority back to the **ISO** in accordance with the **ISO**’**s** restoration plan. **EOP-005-AB-2 – Requirement R13** **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. **EOP-006-AB-2 – Requirement R1** **R.1.** The **ISO** must have a restoration plan for its area. The scope of the **ISO**’s restoration plan starts when contracted **blackstart resources** are utilized to re-energize a shut down area of the **bulk electric system**. The scope of the ISO’s restoration plan ends when each operator of a **transmission facility** is interconnected and the **ISO**’s area is connected to all of its neighbouring **reliability coordinator areas**, provided facilities are available to be returned to service. The restoration plan shall include:

Requirements in Section 305.3 of the ISO rules, ***Blackstart Restoration*** **("Section 305.3")**	**Corresponding Requirements in Alberta reliability standards: EOP-005-AB-2, *System Restoration from Blackstart Resources* ("EOP-005-AB-2"); *and* EOP-006-AB-2, *System Restoration Coordination* ("EOP-006-AB-2")**
	R1.1. a strategy to be employed during restoration events for restoring the **interconnected electric system** including minimum criteria for meeting the objectives of the **ISO**'s restoration plan; **R1.2.** operating processes for restoring the **interconnected electric system**; **R1.3.** the elements of coordination between the **ISO** and each **operator** of a **transmission facility** in accordance with the **ISO**'s system restoration plan; **R1.4.** descriptions of the elements of coordination of restoration plans with neighbouring **reliability coordinators**; **R1.5.** criteria and conditions for reestablishing connections between each **operator** of a **transmission facility** within its area, with **transmission operators** in other **reliability coordinator areas**, and with other **reliability coordinators**; **R1.6.** reporting requirements for the entities within the **ISO**'s area during a restoration event; **R1.7.** criteria for sharing information regarding restoration with neighbouring **reliability coordinators** and with **operators** of **transmission facilities** within the **ISO**'s area; and **R1.8.** identification of the **ISO** as the primary contact for disseminating information regarding restoration to neighbouring **reliability coordinators**, and to **operators** of **transmission facilities** within its area. **R1.9.** Intentionally left blank.

** It has been determined that, other than requirement R18, there is no need to place further requirements on the operator of a generating unit that is not a blackstart resource to develop and train staff on a blackstart restoration plan. In blackstart conditions, the AESO or its delegate TFO will direct the restoration of generating units and changes to generation or load level, including large motor start, in accordance with the AESO's or its delegate TFO's restoration plan. Therefore, it is not necessary for the legal owner of a generating unit that is not a blackstart resource to have its own restoration plan. The operator of a generating unit is provided with a description of its role in the restoration plan of the operator of the transmission facility that the generating unit interconnects with in accordance with requirement R2(b) of EOP-005-AB-2. Additionally, the legal owner of a generating unit is trained on the AESO's restoration plan in accordance with requirement R18 of EOP-005-AB-2.