**PRC-005-AB2-6**

Protection System, Automatic Reclosing and Sudden Pressure Relaying Maintenance

Effective Date: October 13, 2020

# Audit Summary

|  |  |  |
| --- | --- | --- |
| **Registered Entity:** | [Registered Entity name as it appears in the AESO ARS Registry] | |
| **Functional Entity:** | [Functional entities for which the Registered Entity above was registered throughout the audit period] | |
| **Audit Period:** | From: [Audit start date or standard effective date, whichever comes later]  To: [Audit end date or standard withdrawal/supersede date, whichever comes first] | |
| **Audit:** | [Scheduled (YYYY-QX) or Spot Check YYYY-MM-DD] | |
| **Compliance Monitoring Entity:** | Alberta Electric System Operator (AESO) | |
| **Suspected Non-Compliance to the standard?** |  |  |
|  | [If **Yes**, list the requirements with suspected contravention findings e.g. R1, R2, R5] |
| **Date of Completion:** | [Use YYYY-MM-DD format] | |

## Assessment Commentary

[Information (if any) relevant to audit findings below]

## Findings

|  |  |
| --- | --- |
| R1 | [Summary of Findings] |
| R2 | [Summary of Findings] |
| R3 | [Summary of Findings] |
| R4 | [Summary of Findings] |
| R5 | [Summary of Findings] |

## Contact Information

|  |  |  |
| --- | --- | --- |
| **Audited Entity** | | |
| Compliance Primary | [Name]  [Title]  [Phone]  [Email] | |
| Subject Matter Expert | [Name]  [Title]  [Phone]  [Email] | |
|  | | |
| **AESO Team** | | **Sign-off** |
| Lead Auditor | [Name]  [Title]  [Phone]  [Email] | Date:  Signature: |
| Auditor | [Name]  [Title]  [Phone]  [Email] | Date:  Signature: |
| Compliance Manager | [Name]  [Title]  [Phone]  [Email] | Date:  Signature: |
| Standard Owner | [Name]  [Title]  [Phone]  [Email] | Date:  Signature: |

# Applicability

This **reliability standard**applies to:

The entities identified in subsection 2.1 must apply the requirements of this **reliability standard** to the devices listed in subsection 2.2 unless exempted under subsection 2.3.

**2.1** This **reliability standard** applies to:

(a) the **legal owner** of a **transmission facility** that:

(i) is part of the **bulk electric system**, excluding any transformer with less than 2 terminals energized at 100 kV or higher;

(ii) is not part of the **bulk electric system**, and owns any of the following:

(A) the **protection systems** used for the **ISO**’s **underfrequency load shedding program**;

(B) the **protection systems** used for **undervoltage load shed systems** installed to prevent system voltage collapse or voltage instability for the **reliability** of the **interconnected electric system**;

(C) **protection systems** installed as a **remedial action scheme**, including automatic reclosing applied as an integral part of a **remedial action scheme**, for the **reliability** of the **interconnected electric system**; or

(iii) is material to this **reliability standard** and to the **reliability** of either the **interconnected electric system** or the City of Medicine Hat electric system, as the **ISO** determines and includes on a list published on the AESO website, which the **ISO** may amend from time to time in accordance with the process set out in Appendix 3.

(b) the **legal owner** of a **generating unit** that:

(i) has a **maximum authorized real power** rating greater than 18 MW and is either:

(A) directly connected to the **transmission system**,

(B) directly connected to **transmission facilities** within the City of Medicine Hat, or

(C) part of an industrial complex that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat;

(ii) is within a power plant that:

(A) is not part of an **aggregated generating facility**;

(B) is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat; and

(C) has a combined **maximum authorized real power** rating greater than 67.5 MW;

(iii) is a **black start resource**; or

(iv) is material to this **reliability standard** and to the **reliability** of either the **interconnected electric system** or the City of Medicine Hat electric system, regardless of the **maximum authorized real power** rating of the **generating unit**, as the **ISO** determines and includes on a list published on the AESO website, which the **ISO** may amend from time to time in accordance with the process set out in Appendix 3;

(c) the **legal owner** of an **aggregated generating facility** that:

(i) has a **maximum authorized real power** rating greater than 67.5 MW and is either:

(A) directly connected to the **transmission system**;

(B) directly connected to **transmission facilities** within the City of Medicine Hat; or

(C) part of an industrial complex that is directly connected to the **transmission system** or to **transmission facilities** within the City of Medicine Hat;

(ii) is a **black start resource**; or

(iii) is material to this **reliability standard** and to the **reliability** of either the **interconnected electric system** or the City of Medicine Hat electric system, regardless of the **maximum authorized real power** rating of the **aggregated generating facility**, as the **ISO** determines and includes on a list published on the AESO website, which the **ISO** may amend from time to time in accordance with the process set out in Appendix 3.

**2.2** This **reliability standard** applies to the following devices:

(a) **protection systems** and sudden pressure relaying that are installed for the purpose of detecting faults on **system elements** that are part of the **bulk electric system**, excluding a transformer that does not have its primary terminal and at least one secondary terminal energized at 100 kV or higher;

(b) **protection systems** used for the **ISO**’s **underfrequency load shedding** program;

(c) **protection systems** used for **undervoltage load shed** systems installed to prevent system voltage collapse or voltage instability for the reliability of the **interconnected electric system**;

(d) **protection systems** installed as a **remedial action scheme** for the **reliability** of the **interconnected electric system**;

(e) **protection systems** and sudden pressure relaying for **generating units**, including:

(i) **protection systems** that act to trip the **generating unit** either directly or via lockout or auxiliary tripping relays;

(ii) **protection systems** and sudden pressure relaying for **generating unit** step-up transformers; and

(iii) **protection systems** and sudden pressure relaying for station service or excitation transformers connected to the **generating unit** bus, that act to trip the **generating unit** either directly or via lockout or tripping auxiliary relays;

(f) **protection systems** and sudden pressure relaying for **aggregated generating facilities** from and including the **collector bus** to a common point of connection at 100 kV or above;

(g) automatic reclosing:

(i) applied on all transmission lines connected to a bus operated at a voltage level of 100 kV or higher located at generating plant substations where the combined **maximum authorized real power** is greater than 500 MW;

(ii) applied on all transmission line terminals operated at a voltage level of 100 kV or higher at substations one bus away from generating plants specified in Section 2.2 (g)(i) when the substation is less than 10 circuit-miles from the generating plant substation; and

(iii) applied as an integral part of a **remedial action scheme** specified in subsection (d) above.

**2.3** Automatic reclosing addressed in subsections 2.2(g)(i) and 2.2(g)(ii) may be excluded if the equipment owner can demonstrate to the **ISO** that a close-in three-phase fault present for twice the normal clearing time (capturing a minimum trip-close-trip time delay) does not result in a total loss of gross generation in either the **interconnected electric system** or the City of Medicine Hat electric system exceeding the gross capacity of the largest **generating unit** where the automatic reclosing is applied.

# Compliance Assessment

| **Requirement & Measure** | **Evidence Submission** | **Evidence Description** | **Evidence** | **Assessment Approach** | **Auditor Notes** |
| --- | --- | --- | --- | --- | --- |
| **R1** Each **legal owner** of a **transmission facility**, **legal owner** of a **generating unit**, and **legal owner** of an **aggregated generating facility** must establish a **protection system** maintenance program for its **protection systems**, automatic reclosing, and sudden pressure relaying.  The **protection system** maintenance program must:  **R1.1** identify which maintenance method (a time-based method, the performance-based method per Appendix 2, or a combination of these maintenance methods) is used to address each **protection system**, automatic reclosing, and sudden pressure relaying component type (as identified in Appendix 1). All batteries associated with the station dc supply component type of a **protection system** must be included in a time-based program as described in Table 1-4 and Table 3 of Appendix 1.  **R1.2** include the applicable monitored component attributes applied to each **protection system**, automatic reclosing, and sudden pressure relaying component type consistent with the maintenance intervals specified in Tables 1-1 through 1-5, Table 2, Table 3, Tables 4-1 through 4-3, and Table 5 of Appendix 1, where monitoring is used to extend the maintenance intervals beyond those specified for unmonitored **protection system**, automatic reclosing, and sudden pressure relaying components.  **MR1** Evidence of having a documented **protection system** maintenance program in accordance with requirement R1 exists. Evidence may include, but is not limited to a documented **protection system** maintenance program that may include supporting information such as manufacturer’s specifications or engineering drawings or other equivalent evidence. | **AR1** Please provide: | [Click and edit to enter description for AR1(i) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR1 (i) to determine whether protection system maintenance program(s) in accordance with R1 exists and were in effect throughout the audit period.  Review AR1 (i) to verify whether all the applicable components types listed in AR1 (ii) are included in the program. | [For AESO use only] |
| 1. Documented protection system maintenance program(s) as per R1 in effect during the audit period; 2. List(s) of applicable components types listed as per Appendix 1; 3. For component types that use monitoring to extend the maintenance intervals, evidence such as manufacturer’s specifications or engineering drawings that the appropriate component attributes are monitored. |
| **AR1.1** Intentionally left blank. |  |  | Review AR1 (i) and AR1 (ii) to verify whether the entity protectionsystemmaintenance program(s) identifies which maintenance method(s) is used to address each protection system, automatic reclosing, and sudden pressure relaying component type.  Review AR1 (i) and AR1 (ii) to verify whether all batteries associated with the station dc supply component type of a protection system, if any, are included in a time-based program. | [For AESO use only] |
| **AR1.2** Intentionally left blank. |  |  | Review AR1 (i), AR1 (ii) and AR1 (iii) to verify that the entity protectionsystemmaintenance program(s) includes the applicable monitored component attributes applied to each component type consistent with the maintenance intervals specified in Tables 1-1 through 1-5, Table 2, Table 3, Table 4-1 through 4-3, and Table 5 where monitoring is used to extend the maintenance intervals beyond those specified for unmonitored protection system components. | [For AESO use only] |
| or any other evidence to demonstrate compliance to R1. | [Click and edit to enter description for any other submitted evidence] | [Click and edit to embed file or link to evidence] | Review any other evidence submitted to determine whether it meets the intent of R1. | [For AESO use only] |
| **Findings** | | | | | |
| [For AESO use only] | | | | | |

# Compliance Assessment

| **Requirement & Measure** | **Evidence Submission** | **Evidence Description** | **Evidence** | **Assessment Approach** | **Auditor Notes** |
| --- | --- | --- | --- | --- | --- |
| **R2** Each **legal owner** of a **transmission facility**, **legal owner** of a **generating unit**, and **legal owner** of an **aggregated generating facility** that uses performance-based maintenance intervals in its **protection system** maintenance program must follow the procedure established in Appendix 2 to establish and maintain its performance-based intervals.  **MR2** Evidence of following the procedure for performance-based maintenance intervals as required in requirement R2 exists. Evidence may include, but is not limited to, component lists, dated maintenance records and dated analysis records and results or other equivalent evidence. | **AR2** Please provide: | [Click and edit to enter description for AR2(i) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR2 (i) to verify whether the entity developed lists with a description of components included in each segment.  Review AR2 (i) to verify whether the minimum segment population is sixty (60) components or above.  Review AR2 (i) to verify whether the segments were comprised of at least 60 components, in each year during the audit period. | [For AESO use only] |
| 1. A list of all of the segments that were established and/or maintained as part of performance-based maintenance during the audit period. The list shall identify for all segments, a segment title, the component type, the number of components included in the segment, and the time periods in which the segment was being established, and/or was being used, as part of the performance-based protection system maintenance program. |
| 1. All lists, developed by the entity during the audit period, used to establish the technical justification for the initial use of performance-based protection system maintenance program(s). The lists shall include a description of all components in each segment. | [Click and edit to enter description for AR2(ii) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR2 (ii) to verify whether the components within each selected segment were of a consistent design standard, or are/were of a particular model or type from a single manufacturer that typically share other common elements. | [For AESO use only] |
| 1. Evidence that, while establishing the technical justification for the initial use of all performance-based maintenance segments, the components in each segment were maintained in accordance to the time-based maximum allowable intervals established in Tables 1-1 through 1-5, Table 3, Tables 4-1 through 4-3, and Table 5 until results of maintenance activities for each segment were available for a minimum of thirty (30) individual components in each segment. | [Click and edit to enter description for AR2(iii) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR (iii) to verify whether the entity maintained the components in each selected segment according to the time-based maximum allowable intervals and mandatory activities established in Tables 1-1 through 1-5, Table 3, Tables 4-1 through 4-3, and Table 5, until results of maintenance activities for a minimum of thirty (30) individual components were available as part of the process to establish the segment. | [For AESO use only] |
| 1. Evidence that, while establishing the technical justification for the initial use of all performance-based maintenance segments, the maintenance program activities and results for each segment were documented, including maintenance dates and countable events for each included component. | [Click and edit to enter description for AR2(iv) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR2 (iv) to validate whether the entity documented the maintenance program activities and results for each segment, including maintenance dates and countable events for each included component. | [For AESO use only] |
| 1. Evidence that, while establishing the technical justification for the initial use of all performance-based maintenance segments, the maintenance program activities and results for each segment were analyzed to determine the overall performance of the segment and develop maintenance intervals. | [Click and edit to enter description for AR2(v) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR2 (v) to validate whether the entity analyzed the maintenance activities and results to determine the overall performance for each selected segment to develop maintenance intervals. | [For AESO use only] |
| 1. Evidence that, while establishing the technical justification for the initial use of all performance-based maintenance segments, the maximum allowable maintenance interval for each segment was determined such that the segment experiences countable events on no more than 4% of the components within the segment, for the greater of either the last thirty (30) components maintained or all components maintained in the previous year. 2. The countable events percentage experienced by all performance-based maintenance segments each year during the audit period. | [Click and edit to enter description for AR2(vi) and AR2(vii) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR2 (vi) and AR2 (vii) to validate whether the entity, in every year during the audit period, determined the maximum allowable maintenance interval for each segment such that the segment experiences countable events on no more than 4% of the components within the segment, for the greater of either the last thirty (30) components maintained or all components maintained in the previous year. | [For AESO use only] |
| 1. Evidence that, while maintaining the technical justification for the ongoing use of all performance-based protection system maintenance programs, the list of components and segments, and/or description if any changes occurred within all segments was updated at least annually, in every year during the audit period. | [Click and edit to enter description for AR2(viii) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR2 (viii) to validate whether the entity annually updated the list of components and segments and/or descriptions in the selected segments if any changes occurred within the segment, in every year during the audit period. | [For AESO use only] |
| 1. Evidence that, while maintaining the technical justification for the ongoing use of all performance-based protection system maintenance programs, maintenance was performed on at least the greater of 5% of the components (addressed in the performance-based protection system maintenance program) in each segment or three (3) individual components within the segment in every year during the audit period. | [Click and edit to enter description for AR2(ix) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR2 (ix) to validate whether the entity performed maintenance on at least the greater of 5% of the components (addressed in the performance-based protection system maintenance program) in each selected segment or three (3) individual components within the selected segment in every year during the audit period. | [For AESO use only] |
| 1. Evidence that, while maintaining the technical justification for the ongoing use of all performance-based protection system maintenance programs, the maintenance program activities and results for each segment were analyzed for the prior year, to determine the overall performance of the segment, in every year during the audit period. | [Click and edit to enter description for AR2(x) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR2 (x) to validate whether the entity analyzed the maintenance program activities and results for each segment to determine the overall performance of the segment, in every year during the audit period. | [For AESO use only] |
| 1. Evidence that, in every year during the audit period, while maintaining the technical justification for the ongoing use of all performance-based protection system maintenance programs, the prior year’s data was used to determine the maximum allowable maintenance interval for each segment such that the segment experiences countable events on no more than 4% of the components within the segment, for the greater of either the last 30 components maintained or all components maintained in the previous year. | [Click and edit to enter description for AR2(xi) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR2 (xi) to validate whether the entity used the prior year’s data, in every year during the audit period, to determine the maximum allowable maintenance interval for each segment such that the segment experiences countable events on no more than 4% of the components within the segment, for the greater of either the last thirty (30) components maintained or all components maintained in the previous year. | [For AESO use only] |
| 1. Evidence that, while maintaining the technical justification for the ongoing use of all performance-based protection system maintenance programs, in every year during the audit period, an action plan was developed, documented, and implemented to reduce the countable events to 4% or less of the segment population within 3 years, if the components in a segment maintained through a performance-based protection system maintenance program experience countable events in excess of 4%. | [Click and edit to enter description for AR2(xii) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR2 (xii) to validate whether, if the components in a segment maintained through a performance-based protection system maintenance program experience more than 4% countable events in any year during the audit period, the entity developed, documented, and implemented an action plan to reduce the countable events to 4% or less of the segment population within three years. | [For AESO use only] |
| 1. Evidence that, in any year during the audit period, if the components in any segment maintained through a protection system maintenance program had experienced more than 4% countable events, the countable events were reduced to 4% or less of the population of that segment within 3 years of the initial determination of the exceedance of 4%. | [Click and edit to enter description for AR2(xiii) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR2 (xiii) to validate whether, in all years during the audit period, if the components in any segment maintained through a protection system maintenance program had experienced more than 4% countable events, the entity had reduced the countable events to 4% or less of the population of that segment within 3 years of the initial determination of the exceedance of 4%. | [For AESO use only] |
| 1. All performance-based maintenance corrective action plans developed, and implemented by the entity during the audit period. | [Click and edit to enter description for AR2(xiv) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR2 (xiv) to validate whether, if the components in a segment maintained through a performance-based protection system maintenance program experience more than 4% countable events in any year during the audit period, the entity developed, documented, and implemented an action plan to reduce the countable events to 4% or less of the segment population within three years. | [For AESO use only] |
| 1. Evidence that all components within all performance-based maintenance segments were of a consistent design standard, or a particular model or type from a single manufacturer that typically share other common elements, in each segment, in all years during the audit period. | [Click and edit to enter description for AR2(xv) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR2 (xv) to verify whether the components within each selected segment were of a consistent design standard, or are or were of a particular model or type from a single manufacturer that typically share other common elements, in every year during the audit period. | [For AESO use only] |
| or any other evidence to demonstrate compliance to R2. | [Click and edit to enter description for any other submitted evidence] | [Click and edit to embed file or link to evidence] | Review any other evidence submitted to determine whether it meets the intent of R2. | [For AESO use only] |
| **Findings** | | | | | |
| [For AESO use only] | | | | | |

# Compliance Assessment

| **Requirement & Measure** | **Evidence Submission** | **Evidence Description** | **Evidence** | **Assessment Approach** | **Auditor Notes** |
| --- | --- | --- | --- | --- | --- |
| **R3** Each **legal owner** of a **transmission facility**, **legal owner** of a **generating unit**, and **legal owner** of an **aggregated generating facility** that uses time-based maintenance program(s) must maintain its **protection system**, automatic reclosing, and sudden pressure relaying components that are included within the time-based maintenance program in accordance with the minimum maintenance activities and maximum maintenance intervals prescribed within Tables 1-1 through 1-5, Table 2, Table 3, Tables 4-1 through 4-3, and Table 5 of Appendix 1.  **MR3** Evidence of maintaining **protection system**, automatic reclosing, and sudden pressure relaying components in accordance with the minimum maintenance activities and maximum maintenance intervals as required in requirement R3 exists. Evidence may include, but is not limited to, dated maintenance records, dated maintenance summaries, dated check-off lists, dated inspection records, or dated work orders or other equivalent evidence. | **AR3** Please provide:   1. Electrical system diagram(s), covering all BES facilities owned throughout the audit period. The diagram(s) must identify all BES facilities, including but not limited to transmission lines, substations, generators, circuit breakers, capacitor banks, shunt reactors, static var compensators, etc. The diagram(s) must identify the voltage-class, and the entity identifier of all facilities; 2. A list of all protection system, automatic reclosing, and sudden pressure relaying components maintained under time-based maintenance program(s) whose maintenance intervals have been extended beyond those specified for unmonitored components in accordance with Tables 1-1 through 1-5, Table 2, Table 3, Table 4-1 through 4-3, and Table 5, PRC-005-6; 3. A brief description of the structure of entity’s protection system, automatic reclosing, and sudden pressure relaying components maintenance data files for each component type. 4. A list of all components associated with RAS protection systems maintained under time-based maintenance program(s); 5. A list of all components associated with UFLS protection systems maintained under time-based maintenance program(s); 6. A list of all components associated with UVLS protection systems maintained under time-based maintenance program(s). | [Click and edit to enter description for AR3(i), AR3(ii), AR3(iii), AR3(iv), AR3(v), AR3(vi), AR3(vii), and AR3(viii) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR3 (i) to AR3 (viii) to verify the completeness and correctness of the information. | [For AESO use only] |
| 1. A list of all components being maintained using time-based maintenance program(s), including: 2. The protected BES element identification; 3. The component type; 4. The station/substation, or other location of the BES facility; 5. The protection system, automatic reclosing, and sudden pressure relaying components identification; 6. The dates of the last two performances of all maintenance activities, or all performances of maintenances activities during the audit period, whichever is greater; 7. The maintenance interval pertaining to the component; 8. The specific rows of Tables 1-1 through 1-5, Table 2, Table 3, Table 4-1 through 4-3, and Table 5 under which the component is being maintained; 9. Whether the protection system, automatic reclosing, and sudden pressure relaying component maintenance intervals have been extended beyond those specified for unmonitored components in accordance with Tables 1-1 through 1-5, Table 2, Table 3, Table 4-1 through 4-3, and Table 5; 10. Indication if the Component is associated with RAS; 11. Indication if the Component is associated with UFLS; 12. Indication if the Component is associated with UVLS. 13. The number of BES protection system, automatic reclosing, and sudden pressure relaying components owned by the entity, by component type. |
| 1. Evidence that the components and associated alarm paths have the attributes identified in Tables 1-1 through 1-5, Table 2, Table 3, Table 4-1 through 4-3, and Table 5, justifying the maintenance interval and the scope of maintenance activities being performed. | [Click and edit to enter description for AR3(ix) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR3 (ix) to validate whether the components and alarm paths actually have the monitoring attributes identified in Tables 1-1 through 1-5, Table 2, Table 3, Table 4-1 through 4-3, and Table 5, justifying the extension of the applicable maintenance interval, if any, and the scope of maintenance activities being performed. | [For AESO use only] |
| 1. Evidence for either the most recent performance of all maintenance activities, where the maintenance interval is longer than the audit cycle, or all performances of maintenance activities during the audit period, where the maintenance interval is shorter than the audit cycle, including dated performed maintenance records and the specific activities performed. The evidence may include, but is not limited to, dated maintenance records, dated maintenance summaries, dated check-off lists, dated inspection records, or dated work orders. | [Click and edit to enter description for AR3(x) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR3 (x) to verify whether the protection, automatic reclosing, and sudden pressure relaying system components included within the time-based maintenance program were maintained in accordance with the minimum maintenance activities and maximum maintenance intervals prescribed in Tables 1-1 through 1-5, Table 2, Table 3, Table 4-1 through 4-3, and Table 5. | [For AESO use only] |
| 1. Evidence that the alarm paths of those protection system, automatic reclosing, and sudden pressure relaying components whose maintenance intervals have been extended based upon monitoring and whose mandatory maintenance activities are based upon monitoring have been maintained in accordance with Table 2. | [Click and edit to enter description for AR3(xi) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR3 (xi) to validate whether the alarm paths of those protection system, automatic reclosing, and sudden pressure relaying components whose maintenance intervals have been extended, or whose mandatory activities are based upon monitoring, have been maintained in accordance with Table 2. | [For AESO use only] |
| or any other evidence to demonstrate compliance to R3. | [Click and edit to enter description for any other submitted evidence] | [Click and edit to embed file or link to evidence] | Review any other evidence submitted to determine whether it meets the intent of R3. | [For AESO use only] |
| **Findings** | | | | | |
| [For AESO use only] | | | | | |

# Compliance Assessment

| **Requirement & Measure** | **Evidence Submission** | **Evidence Description** | **Evidence** | **Assessment Approach** | **Auditor Notes** |
| --- | --- | --- | --- | --- | --- |
| **R4** Each **legal owner** of a **transmission facility**, **legal owner** of a **generating unit**, and **legal owner** of an **aggregated generating facility** that uses performance-based maintenance program(s) in accordance with requirement R2 must implement and follow its **protection system** maintenance program for its **protection system**, automatic reclosing, and sudden pressure relaying components that are included within the performance-based program(s).  **MR4** Evidence of following the **protection system** maintenance program for performance-based maintenance program(s) as required in requirement R4 exists. Evidence may include, but is not limited to, dated maintenance records, dated maintenance summaries, dated check-off lists, dated inspection records, or dated work orders or other equivalent evidence. | **AR4** Please provide: | [Click and edit to enter description for AR4(i) and AR4(ii) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR4 (i) and AR4 (ii) to verify the completeness and corrected of the information. | [For AESO use only] |
| 1. A list that identifies each segment and the following information for each segment: 2. The segment’s title; 3. The component type; 4. The number of components in each segment; 5. The time periods in which the segment was being established and/or was being used, as part of the performance-based protection systemmaintenance program. 6. Information pertaining to each segment[[1]](#footnote-1) that contains: 7. The segment’s title; 8. The component type; 9. The identification of all components comprising the segment; 10. For each component, the component’s station/substation, or other BES locations; 11. For each component, the dates of the last two performances of all maintenance activities, or all performances of maintenances activities during the audit period, whichever is greater; 12. The maintenance interval pertaining to the segment for all time periods during which the segment was being maintained during the audit period, and the interval in use during the year prior to the audit period; 13. The specific row of Tables 1-1 through 1-5, Table 2, Table 3, Table 4-1 through 4-3, and Table 5 under which each component is being maintained. |
| 1. Evidence that each component[[2]](#footnote-2) in the segment(s) being maintained under performance based maintenance program(s) has the attributes required under Tables 1-1 through 1-5, Table 2, Table 3, Table 4-1 through 4-3, and Table 5 justifying use of the minimum maintenance activities being performed by the entity for the particular component. 2. For each component[[3]](#footnote-3), either the most recent performance of all maintenance activities, where the maintenance interval is longer than the audit cycle, or all performances of maintenance activities during the audit period, where the maintenance interval is shorter than the audit cycle, including dated maintenance performed records, and the specific activities performed. The evidence may include but is not limited to dated maintenance records, dated maintenance summaries, dated check-off lists, dated inspection records, or dated work orders. | [Click and edit to enter description for AR4(iii) and AR4(iv) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR4 (iii) and (iv) to verify that the protection system, automatic reclosing, and sudden pressure relaying components were maintained in accordance with the performance-based maintenance time intervals in effect.  Review AR4 (iv) to verify that the maintenance activities reported as completed were in fact performed on the components. | [For AESO use only] |
| 1. Evidence that the alarm paths associated with each component were maintained in accordance with Table 2, where monitoring was being used to determine the applicable mandatory maintenance activities. | [Click and edit to enter description for AR4(v) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR4 (v) to verify that the alarm paths associated with the protection system, automatic reclosing, and sudden pressure relaying components were maintained in accordance with Table 2, where monitoring was used to determine the maintenance activities performed on the component. | [For AESO use only] |
| or any other evidence to demonstrate compliance to R4. | [Click and edit to enter description for any other submitted evidence] | [Click and edit to embed file or link to evidence] | Review any other evidence submitted to determine whether it meets the intent of requirement R4. | [For AESO use only] |
| **Findings** | | | | | |
| [For AESO use only] | | | | | |

# Compliance Assessment

| **Requirement & Measure** | **Evidence Submission** | **Evidence Description** | **Evidence** | **Assessment Approach** | **Auditor Notes** |
| --- | --- | --- | --- | --- | --- |
| **R5** Each **legal owner** of a **transmission facility**, **legal owner** of a **generating unit**, and **legal owner** of an **aggregated generating facility** must demonstrate efforts to correct identified unresolved maintenance issues.  **MR5** Evidence of demonstrating efforts to correct identified unresolved maintenance issues as required in requirement R5 exists. Evidence may include, but is not limited to, work orders, replacement component orders, invoices, project schedules with completed milestones, return material authorizations or purchase orders or other equivalent evidence. | **AR5** Please provide:   1. A list of identified unresolved maintenance issues, including the component name, component location, and the date and time that the unresolved maintenance issues are identified. (Note: unresolved maintenance issue means a maintenance issue that has not been corrected by the end of the audit period). 2. Dated documentation of efforts to correct the identified unresolved maintenance issues pertaining to R5 for identified unresolved maintenance issues[[4]](#footnote-4) listed in AR5 (i). | [Click and edit to enter description for AR5(i) and AR5(ii) submitted evidence] | [Click and edit to embed file or link to evidence] | Review AR5 (ii) to determine whether efforts to correct identified unresolved maintenance issues listed in AR5 (i) are demonstrated. | [For AESO use only] |
| or any other evidence to demonstrate compliance to R5. | [Click and edit to enter description for any other submitted evidence] | [Click and edit to embed file or link to evidence] | Review any other evidence submitted to determine whether it meets the intent of R5. | [For AESO use only] |
| **Findings** | | | | | |
| [For AESO use only] | | | | | |

# General Notes

The AESO developed this Reliability Standard Audit Worksheet (RSAW) to add clarity and consistency to the audit team’s assessment of compliance with this reliability standard, including the approach elected to assess requirements.

Additionally, the RSAW provides a non-exclusive list of examples of the types of evidence a market participant may produce or may be asked to produce to demonstrate compliance with this reliability standard. A market participant’s adherence to the examples contained within this RSAW does not constitute compliance with the reliability standard.

This document is not an AESO authoritative document and revisions to it may be made from time to time by the AESO. Market participants are notified of revisions through the stakeholder update process.

# Notes to File

[For AESO use only: any observations, remarks or action items for future audits]

# Revision History

|  |  |  |
| --- | --- | --- |
| **Version** | **Issue Date** | **Description** |
| 1.0 | January 4, 2021 | The initial version of Worksheet |
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1. Evidence may be provided for the entire population in the initial evidence submission at the Entity’s discretion. Otherwise, the AESO will request specific samples. [↑](#footnote-ref-1)
2. Evidence may be provided for the entire population in the initial evidence submission at the Entity’s discretion. Otherwise, the AESO will request specific samples. [↑](#footnote-ref-2)
3. Evidence may be provided for the entire population in the initial evidence submission at the Entity’s discretion. Otherwise, the AESO will request specific samples. [↑](#footnote-ref-3)
4. Evidence may be provided for the entire population in the initial evidence submission at the Entity’s discretion. Otherwise, the AESO will request specific samples. [↑](#footnote-ref-4)