

November 30, 2021

**VIA ELECTRONIC FILING**

Ms. Kimberly D. Bose  
Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, DC 20426

Re: **NERC Full Notice of Penalty regarding American Electric Power Service Corporation,  
FERC Docket No. NP22-\_-000**

Dear Ms. Bose:

The North American Electric Reliability Corporation (NERC) hereby provides this Notice of Penalty<sup>1</sup> regarding American Electric Power Service Corporation and several of its affiliates, specifically NERC Registry ID# NCR00682,<sup>2</sup> NCR11401,<sup>3</sup> and NCR01056,<sup>4</sup> (collectively AEP) in accordance with the Federal Energy Regulatory Commission's (Commission or FERC) rules, regulations, and orders, as well as NERC's Rules of Procedure including Appendix 4C (NERC Compliance Monitoring and Enforcement Program (CMEP)).<sup>5</sup>

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<sup>1</sup> *Rules Concerning Certification of the Electric Reliability Organization; and Procedures for the Establishment, Approval, and Enforcement of Electric Reliability Standards, Order No. 672, 114 FERC ¶ 61,104, order on reh'g, Order No. 672-A, 114 FERC ¶ 61,328 (2006); Notice of New Docket Prefix "NP" for Notices of Penalty Filed by the N. Am. Elec. Reliability Corp., Docket No. RM05-30-000 (February 7, 2008); Mandatory Reliability Standards for the Bulk-Power System, Order No. 693, 118 FERC ¶ 61,218, order on reh'g, Order No. 693-A, 120 FERC ¶ 61,053 (2007).*

<sup>2</sup> American Electric Power Service Corporation as agent for Appalachian Power Company, Indiana Michigan Power Company, Kentucky Power Company, Kingsport Power Company, Ohio Power Company, Wheeling Power Company, AEP Ohio Transmission Company, AEP Appalachian Transmission Company, AEP West Virginia Transmission Company, AEP Indiana Michigan Transmission Company, AEP Kentucky Transmission Company, Inc. (AEPSC) was included on the NERC Compliance Registry as a DP, GO, RP, TO, and TOP on May 30, 2007, and as a TP on June 20, 2018.

<sup>3</sup> AEP Generation Resources Inc. (AEPGR) was included on the NERC Compliance Registry as a GO and GOP on January 1, 2014.

<sup>4</sup> AEP as Agent for AEP OK Transco., PSCO, and SWEPCO (AEPW) was included on the NERC Compliance Registry as a DP, GO, GOP, RP, TO, TOP, and TP on May 31, 2007.

<sup>5</sup> See 18 C.F.R § 39.7(c)(2) and 18 C.F.R § 39.7(d).

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Washington, DC 20005  
202-400-3000 | [www.nerc.com](http://www.nerc.com)

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NERC is filing this Notice of Penalty, with information and details regarding the nature and resolution of the violations,<sup>6</sup> with the Commission because ReliabilityFirst Corporation (RF) and the Entity have entered into a Settlement Agreement to resolve all outstanding issues arising from RF’s determination and findings of the violations of the Operations and Planning Reliability Standards listed below.

According to the Settlement Agreement, the Entity neither admits nor denies the violations, but has agreed to the assessed penalty of five hundred seventy thousand dollars (\$570,000), in addition to other remedies and actions to mitigate the instant violations and facilitate future compliance under the terms and conditions of the Settlement Agreement.

Under an existing coordinated oversight agreement, the Entity’s penalty will be divided among the Regional Entities as follows. The Entity shall pay \$570,000 to RF, and RF shall divide that penalty amount in two parts based on the relative net energy for load (NEL) for each Region, and shall distribute the NEL-based proportional allocation to Midwest Reliability Organization (MRO). Of the total penalty remitted, RF shall distribute \$188,100 to MRO.

**Statement of Findings Underlying the Violations**

This Notice of Penalty incorporates the findings and justifications set forth in the Settlement Agreement, by and between RF and the Entity. The details of the findings and basis for the penalty are set forth in the Settlement Agreement and herein.

In accordance with Section 39.7 of the Commission’s regulations, 18 C.F.R. § 39.7 (2021), NERC provides the following summary table identifying each violation of a Reliability Standard resolved by the Settlement Agreement. Further information on the subject violations is set forth in the Settlement Agreement and herein.

<b>Violation(s) Determined and Discovery Method</b>								
<small>*SR = Self-Report / SC = Self-Certification / CA = Compliance Audit / SPC = Spot Check / CI = Compliance Investigation</small>								
NERC Violation ID	Standard	Req.	VRF/VSL	Applicable Function(s)	Discovery Method* & Date	Violation Start-End Date	Risk	Penalty Amount
RFC2018020207	FAC-009-1	R1	Medium/ Severe	GO, TO	SR 8/2/18	6/18/07 to 2/27/20	Serious	\$570k

<sup>6</sup> For purposes of this document, each violation at issue is described as a “violation,” regardless of its procedural posture and whether it was a possible, alleged, or confirmed violation.

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NERC Violation ID	Standard	Req.	VRF/VSL	Applicable Function(s)	Discovery Method* & Date	Violation Start-End Date	Risk	Penalty Amount
RFC2018018935	PRC-023-2	R1	High/ Severe	TO	SR 12/21/17	4/19/13 to 5/25/18	Moderate	
RFC2018019116	FAC-008-3	R6	Medium/ Lower	GO	SR 1/26/18	1/1/14 to 1/27/17	Moderate	

Information About the Entity

AEP is engaged in the generation and transmission of electricity throughout the United States. AEP is one of the nation’s largest generators of electricity, and owns nearly 26,000 MW of generating capacity in the U.S., serving over 5 million customers in 11 states. AEP also owns the nation’s largest electricity transmission system, a 40,000+ mile network that includes more 765 kV extra-high voltage transmission lines than all other U.S. transmission systems combined. AEP’s transmission system directly or indirectly serves approximately ten percent of the electricity demand in the Eastern Interconnection, the interconnected transmission system that covers 38 eastern and central U.S. states and eastern Canada, and approximately 11 percent of the electricity demand in Electric Reliability Council of Texas, the transmission system that covers much of Texas.

Executive Summary

These violations involve: (a) a widespread issue with the accuracy of AEP’s Facility Ratings across its footprint in both the RF and MRO regions; (b) several instances where AEP had incorrect transmission line Relay Trip Limits; and (c) an isolated issue related to incorrect bus equipment ratings at two generating sites.

**FAC-009-1 R1**

The Regions determined that the Entity did not maintain accurate Facility Ratings for 21% of its Facilities, resulting in 586 inaccurate Facility Ratings across both the RF and MRO regions. Specifically, AEP had inaccurate ratings in 440 Facilities in the RF region, of which 228 required a reduction and 212 required an increase; and in the MRO region, 146 Facilities had inaccurate ratings, of which 71 required a reduction and 75 required an increase. While most inaccuracies were under 10%, the inaccuracies requiring decreases ranged up to 84% in the RF region and 49% in the MRO region; and the inaccuracies requiring increases ranged up to 119% in the RF region and 1,095% in the MRO region. Attachment 1 includes additional facts regarding the violation.

The cause of this violation was AEP’s inadequate internal controls for ensuring that engineering guidelines, which were historically used to ensure that major equipment was not limited by terminal

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equipment (e.g., relays, risers, etc.), were consistently followed when (1) establishing ratings of new facilities, (2) after acquiring existing facilities, or (3) after making changes to existing facilities in the field. A contributing cause was the fact that the current AEP transmission system is a network of affiliates that were acquired over time, each with its own rating methodology at the time of acquisition. Some of the changes at issue were the result of AEP integrating acquired facilities, which were rated based on prior methodology, into its single rating methodology for the entire AEP system.

The Regions determined that this violation posed a serious and substantial risk to the reliability of the bulk power system (BPS). Attachment 1 includes the facts regarding the violation that RF considered in its risk assessment.

The Entity submitted its Mitigation Plans to address the referenced violation. Attachment 1 includes a description of the mitigation activities the Entity took to address this violation. A copy of the Mitigation Plans are included as Attachments F and G.

In addition to the mitigation described above for the violation of FAC-009-1 R1, AEP is also developing a new detective control to walk-down a minimum of 5% of FAC-008-5 applicable assets on an annual basis. AEP is working on developing and implementing this control and will achieve full implementation of the control in 2023. AEP agrees to implement an approach that is risk-based and aligns with scheduled work to determine how it will prioritize walk-downs of its highest risk facilities. AEP will submit that risk based approach to the Regions for review and approval before full implementation of the control. AEP will provide the Regions with quarterly written updates on the development and implementation of the control through the end of 2024. Beginning in 2025, AEP will provide the Regions with semi-annual written updates on the control until the Regions determine these updates are no longer necessary. AEP agrees to submit self-reports for any additional noncompliances discovered through the quarterly internal detective control described in Paragraphs 18(d) and 20 of the Settlement Agreement.

The Entity certified that it had completed all mitigation activities. RF verified that the Entity had completed all mitigation activities. Attachments 1, J, and K provide specific information on RF's verification of the Entity's completion of the activities.

#### **PRC-023-2 R1**

The Regions determined that the Entity had nine instances where its transmission line Relay Trip Limit was not set above 150% of the highest seasonal Facility Rating of a circuit per Criteria 1. These nine instances arose out of upgrades or changes to relays or circuit breakers at various Facilities. When these changes were made, AEP failed to ensure that the transmission line Relay Trip Limits were appropriately adjusted to account for those changes. Attachment 1 includes additional facts regarding the violation.

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The cause of this violation for all nine instances was the lack of an internal control to prevent ratings changes without the review and approval of personnel responsible for determining the line relay trip limit and compliance with PRC-023-2 R1. A major contributing cause was the fact that AEP did not have personnel responsible for determining the line relay trip limit and compliance with PRC-023-2 R1 to serve as an additional check to verify and validate ratings changes before they went into effect.

The Regions determined that this violation posed a moderate and not serious or substantial risk to the reliability of the bulk power system (BPS). Attachment 1 includes the facts regarding the violation that RF considered in its risk assessment.

The Entity submitted its Mitigation Plans to address the referenced violation. Attachment 1 includes a description of the mitigation activities the Entity took to address this violation. A copy of the Mitigation Plans are included as Attachments O, P, and Q.

The Entity certified that it had completed all mitigation activities. RF verified that the Entity had completed all mitigation activities. Attachments 1, U, V, and X provide specific information on RF's verification of the Entity's completion of the activities.

### **FAC-008-3 R6**

RF determined that the Entity did not have matching Isolated Phase Bus (ISO Phase Bus) equipment ratings between engineering correspondence and vendor drawings for Lawrenceburg 1, Lawrenceburg 2, and Waterford 1 Gas Turbines (GTs). As a result, the GT ISO Phase Bus rating was incorrect for Lawrenceburg GT1 and GT2, and Waterford GT1, GT2, and GT3. To correct this, AEPGR revised the FAC-008 one-line drawings for the Waterford and Lawrenceburg Combined Cycle (CC) Units to accurately reflect the revised ISO Phase Bus ratings. The revised ISO Phase Bus ratings became the Most Limiting Series Element (MLSE) for these CC GT MVA ratings during the summer and winter at Lawrenceburg 1 and 2, and the summer for Waterford 1, resulting in minor derates at Lawrenceburg 1 and 2 and at Waterford 1. Attachment 1 includes additional facts regarding the violation.

The cause of this violation was AEPGR's failure to verify and validate that all equipment specifications were correct, which led to incorrect equipment ratings and an incorrect MLSE being identified on the Lawrenceburg and Waterford units. AEPGR did not have an effective internal control in place to verify and validate relevant equipment specifications and that lack of an effective internal control is a contributing cause of this noncompliance. Additionally, AEPGR acquired the Waterford and Lawrenceburg sites from previous owners in 2005 and 2007, respectively. The ISO Phase Buses at the Waterford and Lawrenceburg sites were not engineered or constructed by AEPGR and had been built to

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alternate equipment specifications compared to the rest of AEPGR's engineered and constructed generation Facilities.

RF determined that this violation posed a moderate and not serious or substantial risk to the reliability of the bulk power system (BPS). Attachment 1 includes the facts regarding the violation that RF considered in its risk assessment.

The Entity submitted its Mitigation Plan to address the referenced violation. Attachment 1 includes a description of the mitigation activities the Entity took to address this violation. A copy of the Mitigation Plan is included as Attachment Z.

The Entity certified that it had completed all mitigation activities. RF verified that the Entity had completed all mitigation activities. Attachments 1 and BB provide specific information on RF's verification of the Entity's completion of the activities.

#### Regional Entity's Basis for Penalty

According to the Settlement Agreement, the Regions assessed a penalty of five hundred seventy thousand dollars (\$570,000) for the referenced violations. In reaching this determination, the Regions considered the following factors:

1. The Regions considered the Entity's compliance history with FAC-008-3 R6, PRC-023-1 R1, and PRC-023-2 R1 as aggravating factors in the penalty determination, as discussed in the Settlement Agreement;
2. The violation of FAC-009-1 R1 posed a serious and substantial risk to the reliability of the BPS;
3. The Entity self-reported the violations;
4. The Entity was cooperative throughout the compliance enforcement process;
5. The Entity agreed to settle the violations; and
6. There were no other mitigating or aggravating factors or extenuating circumstances that would affect the assessed penalty.

After consideration of the above factors, the Regions determined that, in this instance, the penalty amount of five hundred seventy thousand dollars (\$570,000) is appropriate and bears a reasonable relation to the seriousness and duration of the violations.

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## **Statement Describing the Assessed Penalty, Sanction, or Enforcement Action Imposed<sup>7</sup>**

### **Basis for Determination**

Taking into consideration the Commission's direction in Order No. 693, the NERC Sanction Guidelines and the Commission's July 3, 2008, October 26, 2009 and August 27, 2010 Guidance Orders,<sup>8</sup> NERC Enforcement staff reviewed the applicable requirements of the violations at issue, and considered the factors listed above.

For the foregoing reasons, NERC Enforcement staff approved the resolution between RF and the Entity and believes that the assessed penalty of five hundred seventy thousand dollars (\$570,000) is appropriate for the violations and circumstances at issue, and is consistent with NERC's goal to promote and ensure reliability of the BPS.

Pursuant to 18 C.F.R. § 39.7(e), the penalty will be effective upon expiration of the 30-day period following the filing of this Notice of Penalty with FERC, or, if FERC decides to review the penalty, upon final determination by FERC.

### **Attachments to be Included as Part of this Notice of Penalty**

The attachments to be included as part of this Notice of Penalty are the following documents:

1. Settlement Agreement by and between RF and the Entity executed October 6, 2021, included as Attachment 1;
2. Record Documents for FAC-009-1 R1:
  - a. The Entity's Self-Reports for FAC-009-1 dated August 2, 2018, February 11, 2020, June 19, 2020, and July 14, 2020, included as Attachments A, B, C, and D to the Settlement Agreement;
  - b. The Entity's Self-Report for FAC-008-3 dated July 1, 2019, included as Attachment E to the Settlement Agreement;

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<sup>7</sup> See 18 C.F.R. § 39.7(d)(4).

<sup>8</sup> N. Am. Elec. Reliability Corp., "Guidance Order on Reliability Notices of Penalty," 124 FERC ¶ 61,015 (2008); N. Am. Elec. Reliability Corp., "Further Guidance Order on Reliability Notices of Penalty," 129 FERC ¶ 61,069 (2009); N. Am. Elec. Reliability Corp., "Notice of No Further Review and Guidance Order," 132 FERC ¶ 61,182 (2010).

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- c. The Entity's Mitigation Plans designated as RFCMIT014369 and RFCMIT015143, included as Attachments F and G to the Settlement Agreement;
  - d. The Entity's Certifications of Mitigation Plan Completion, included as Attachments H and I to the Settlement Agreement; and
  - e. RF's Verifications of Mitigation Plan Completion, included as Attachments J and K to the Settlement Agreement.
3. Record Documents for PRC-023-2 R1:
- a. The Entity's Self-Reports dated December 21, 2017 and August 2, 2018, included as Attachments L, M, and N to the Settlement Agreement;
  - b. The Entity's Mitigation Plans designated as RFCMIT014214, RFCMIT014373, and RFCMIT014372, included as Attachments O, P, and Q to the Settlement Agreement;
  - c. The Entity's Certifications of Mitigation Plan Completion, included as Attachments R, S, and T to the Settlement Agreement; and
  - d. RF's Verifications of Mitigation Plan Completion, included as Attachments U, V, and X to the Settlement Agreement.
4. Record Documents for FAC-008-3 R6:
- a. The Entity's Self-Report January 26, 2018, included as Attachment Y to the Settlement Agreement;
  - b. The Entity's Mitigation Plan designated as RFCMIT013646-1, included as Attachment Z to the Settlement Agreement;
  - c. The Entity's Certifications of Mitigation Plan Completion, included as Attachment AA to the Settlement Agreement; and
  - d. RF's Verifications of Mitigation Plan Completion, included as Attachment BB to the Settlement Agreement.

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**Notices and Communications:** Notices and communications with respect to this filing may be addressed to the following:

<p>*Persons to be included on the Commission’s service list are indicated with an asterisk. NERC requests waiver of the Commission’s rules and regulations to permit the inclusion of more than two people on the service list.</p>	<p>Teresina Stasko*          Assistant General Counsel and Director of Enforcement          North American Electric Reliability Corporation          1325 G Street NW, Suite 600          Washington, DC 20005          (202) 400-3000          (202) 644-8099 – facsimile          teresina.stasko@nerc.net</p>
<p>Niki Schaefer*          Vice President &amp; General Counsel          niki.schaefer@rfirst.org          216-503-0611 Phone</p>	<p>James McGrane*          Senior Counsel          North American Electric Reliability Corporation          1325 G Street NW, Suite 600          Washington, DC 20005          (202) 400-3000          (202) 644-8099 – facsimile          james.mcgrane@nerc.net</p>
<p>Kristen M. Senk*          Director, Legal &amp; Enforcement          kristen.senk@rfirst.org          216-503-0669 Phone</p>	<p>Caelyn Palmer*          Associate Counsel          North American Electric Reliability Corporation          1325 G Street NW, Suite 600          Washington, DC 20005          (202) 400-3000          (202) 644-8099 – facsimile          caelyn.palmer@nerc.net</p>
<p>Thomas L. Scanlon*          Managing Enforcement Counsel          tom.scanlon@rfirst.org          216-503-0658 Phone</p>	
<p>Maxwell Reisinger*          Senior Counsel          maxwell.reisinger@rfirst.org          216-503-0664 Phone</p>	
<p>ReliabilityFirst Corporation          3 Summit Park Drive, Suite 600          Cleveland, OH 44131</p>	
<p>Tasha Ward*          Director of Enforcement and External Affairs          Midwest Reliability Organization          380 St. Peter Street, Suite 800          Saint Paul, MN 55102</p>	

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### **Conclusion**

NERC respectfully requests that the Commission accept this Notice of Penalty as compliant with its rules, regulations, and orders.

Respectfully submitted,

/s/ Caelyn Palmer

James McGrane  
Senior Counsel  
Caelyn Palmer  
Associate Counsel  
North American Electric Reliability  
Corporation  
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james.mcgrane@nerc.net  
caelyn.palmer@nerc.net

cc: American Electric Power Service Corporation  
AEP Generation Resources Inc.  
ReliabilityFirst Corporation  
Midwest Reliability Organization

Attachments



RELIABILITY FIRST

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<b><i>In re:</i></b> AMERICAN ELECTRIC POWER	)	<b>Violation ID Nos.:</b>
SERVICE CORPORATION AS	)	
AGENT FOR APPALACHIAN	)	RFC2018020207 (FAC-009-1 R1)
POWER COMPANY, INDIANA	)	RFC2018018935 (PRC-023-2 R1)
MICHIGAN POWER COMPANY,	)	RFC2018019116 (FAC-008-3 R6)
KENTUCKY POWER COMPANY,	)	
KINGSPORT POWER COMPANY,	)	
OHIO POWER COMPANY,	)	
WHEELING POWER COMPANY,	)	
AEP OHIO TRANSMISSION	)	
COMPANY, AEP APPALACHIAN	)	
TRANSMISSION COMPANY, AEP	)	
WEST VIRGINIA TRANSMISSION	)	
COMPANY, AEP INDIANA	)	
MICHIGAN TRANSMISSION	)	
COMPANY AND AEP KENTUCKY	)	
TRANSMISSION COMPANY, INC.	)	
	)	
<i>and</i>	)	
	)	
AEP GENERATION RESOURCES INC.	)	
	)	
<i>and</i>	)	
	)	
AMERICAN ELECTRIC POWER	)	
SERVICE CORP. AS AGENT FOR	)	
AEP OKLAHOMA TRANSMISSION	)	
COMPANY, INC., PUBLIC SERVICE	)	
COMPANY OF OKLAHOMA, AND	)	
SOUTHWESTERN ELECTRIC	)	
POWER COMPANY	)	
	)	
	)	
NERC Registry ID Nos.	)	NCR00682
	)	NCR11401
	)	NCR01056
	)	

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**SETTLEMENT AGREEMENT  
BETWEEN  
RELIABILITYFIRST CORPORATION, MIDWEST RELIABILITY ORGANIZATION,  
AND  
AMERICAN ELECTRIC POWER SERVICE CORPORATION**

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**I. EXECUTIVE SUMMARY**

1. ReliabilityFirst Corporation (ReliabilityFirst), Midwest Reliability Organization (MRO) (together with ReliabilityFirst, the “Regions”), and American Electric Power Service Corporation as agent for Appalachian Power Company, Indiana Michigan Power Company, Kentucky Power Company, Kingsport Power Company, Ohio Power Company, Wheeling Power Company, AEP Ohio Transmission Company, AEP Appalachian Transmission Company, AEP West Virginia Transmission Company, AEP Indiana Michigan Transmission Company, AEP Kentucky Transmission Company, Inc., AEP Generation Resources Inc. (AEPGR), and American Electric Power Service Corp. as Agent for AEP Oklahoma Transmission Company, Inc., Public Service Company of Oklahoma, and Southwestern Electric Power Company (AEPW) (collectively, “AEP”)<sup>1</sup> enter into this Settlement Agreement (Agreement) to resolve violations<sup>2</sup> by AEP of FAC-009-1 R1, PRC-023-2 R1, and FAC-008-3 R6.<sup>3</sup>
2. AEP and the Regions (collectively, the “Parties”) stipulate to the facts in this Agreement for the sole purpose of resolving the violations. AEP neither admits nor denies that these facts constitute violations of FAC-009-1 R1, PRC-023-2 R1, and FAC-008-3 R6.
3. This Agreement resolves three violations of Operations & Planning Reliability Standards, specifically FAC-009-1 R1, PRC-023-2 R1, and FAC-008-3 R6. Although AEP self-reported these violations, the Regions recognized that AEP discovered these violations, at least in part, as a result of mitigating actions it undertook to mitigate other issues identified through the compliance monitoring process. These violations involve: (a) a wide-spread issue with the accuracy of AEP’s Facility Ratings across its footprint in both the ReliabilityFirst and MRO regions; (b) several instances where AEP had incorrect transmission line Relay Trip Limits; and, (c) a more limited issue related to incorrect bus equipment ratings at two generating sites. As discussed in more detail below, the Regions imposed a

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<sup>1</sup> AEP is an MRRE. ReliabilityFirst is the Lead Regional Entity and MRO is the Affected Regional Entity, as such ReliabilityFirst coordinated the disposition of this issue with MRO.

<sup>2</sup> For purposes of this document, each violation at issue is described as a “violation,” regardless of its procedural posture and whether it was a possible or confirmed violation.

<sup>3</sup> This Agreement references the version of the Reliability Standard in effect at the time each violation began. AEP, however, committed to perform mitigating actions to comply with the most recent version of the Reliability Standard Requirement.

monetary penalty of \$570,000 for these violations.

## **II. OVERVIEW OF AEP**

4. AEP is engaged in the generation and transmission of electricity throughout the United States. AEP is one of the nation's largest generators of electricity, and owns nearly 26,000 MW of generating capacity in the U.S., serving over 5 million customers in 11 states. AEP also owns the nation's largest electricity transmission system, a 40,000+ mile network that includes more 765 kV extra-high voltage transmission lines than all other U.S. transmission systems combined. AEP's transmission system directly or indirectly serves approximately ten percent of the electricity demand in the Eastern Interconnection, the interconnected transmission system that covers 38 eastern and central U.S. states and eastern Canada, and approximately 11 percent of the electricity demand in Electric Reliability Council of Texas, the transmission system that covers much of Texas.
5. AEPSC is registered on the NERC Compliance Registry as a Distribution Provider, Generator Owner (GO), Generator Operator, Resource Planner, Transmission Owner (TO), Transmission Operator, and Transmission Planner in the ReliabilityFirst region. AEP, in its capacity as a GO and TO, is subject to compliance with FAC-009-1 R1, PRC-023-2 R1, and FAC-008-3 R6.
6. AEPGR is registered on the NERC Compliance Registry as a GO and Generator Operator in the ReliabilityFirst region. AEPGR, in its capacity as a GO, is subject to compliance with FAC-008-3 R6.

## **III. VIOLATIONS**

### **A. FAC-009-1 R1 (RFC2018020207)**

7. FAC-008<sup>4</sup> ensures that Responsible Entities consider all applicable equipment when developing Facility Ratings and develop Facility Ratings pursuant to technically sound principles.
8. A violation of FAC-008-3 R6 has the potential to affect the reliable operation of the Bulk Electric System (BES) by enabling Registered Entities to incorrectly or incompletely determine Facility Ratings, which are essential to determining System Operating Limits.
9. FAC-008-3 R6 states:  
  
**R6.** Each Transmission Owner and Generator Owner shall have Facility Ratings for its solely and jointly owned Facilities that are consistent with the associated Facility Ratings methodology or documentation for determining

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<sup>4</sup> The text of FAC-008-3 R6 and its prior version, FAC-009-1 R1, are similar enough that, in the interest of clarity, this Agreement will focus on the language that is currently in effect.

its Facility Ratings.

*Description of Violations and Risk Assessment*

10. On August 2, 2018, February 11, 2020, June 19, 2020, and July 14, 2020, AEP submitted Self-Reports to ReliabilityFirst stating that, as a TO and GO, it was potentially in violation of FAC-009-1 R1. *See*, Self-Reports, **Attachments A, B, C, and D**. Furthermore, on July 1, 2019, AEP submitted a Self-Report to ReliabilityFirst stating that, as a TO, it was potentially in violation of FAC-008-3 R6. *See*, Self-Reports, **Attachment E**.<sup>5</sup>
11. In the above-referenced Self-Reports, and in other disclosures made to ReliabilityFirst,<sup>6</sup> AEP detailed a wide-spread issue with the accuracy of its Facility Ratings across its footprint in both ReliabilityFirst and MRO. In total, AEP discovered inaccuracies in the ratings of 586 (or 21%) of its Facilities. AEP was required to reduce the rating for 299 of those affected Facilities, or 10% of its total Facilities. Specifically, in the ReliabilityFirst footprint, AEP discovered 440 Facilities that required a rating change, 228 of which required a reduction, and 212 of which required an increase. In the MRO footprint, AEP discovered 146 Facilities that required a rating change, 71 of which required a reduction, and 75 of which required an increase.
12. With respect to the severity of the inaccuracies in the ReliabilityFirst footprint:
  - a. the derates resulted in Facility Ratings decreasing by a range of approximately 1% to 84% (38% of the derates were less than 10%); and
  - b. the increased ratings resulted in Facility Ratings increasing by a range of approximately 1% to 119% (most increases were less than 10%);
13. With respect to the severity of the inaccuracies in the MRO footprint:
  - a. the derates resulted in Facility Ratings decreasing by a range of approximately 1% to 49% (most decreases were less than 10%); and
  - b. the increased ratings resulted in Facility Ratings increasing by a range of approximately 1% to 1,095% (most increases were less than 10%).
14. The root cause of these violations was AEP's inadequate internal controls for ensuring that engineering guidelines, which were historically used to ensure that major equipment was not limited by terminal equipment (e.g., relays, risers, etc.), were consistently followed when establishing ratings of new facilities, after

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<sup>5</sup> The self-report submitted on July 1, 2019, was initially assigned violation ID RFC2019021786. Considering the broad nature of the issue disclosed, and in the interest of clarity, ReliabilityFirst dismissed and consolidated that violation into the current violation.

<sup>6</sup> AEP identified the overwhelming majority of Facility Ratings issues comprising this Agreement through an extent of condition review it conducted as part of its mitigation plan for a prior violation, i.e., RFC2016016427.

acquiring existing facilities, or after making changes to existing facilities in the field. A contributing cause was the fact that the current AEP transmission system is a network of affiliates that were acquired over time, each with its own rating methodology at the time of acquisition. Some of the changes at issue in this Agreement were the result of AEP integrating acquired facilities, which were rated based on another's entity's methodology, into its single rating methodology for the entire AEP system. This root cause involves the management practices of asset and configuration management, which includes controlling changes to assets, reliability quality management, which includes maintaining a system for identifying and deploying internal controls, and integration, verification and validation.

15. Of the five instances detailed above, the earliest any violation began was on June 18, 2007, when AEP was required to comply with FAC-009-1 R1, and the latest any ended was on February 27, 2020, when AEP corrected all of the Facility Ratings in both the ReliabilityFirst and MRO footprints.
16. The Regions determined that the violation posed a serious risk to the reliability of the bulk power system based on the following factors. The risk posed by not having accurate Facility Ratings is that the entity may operate equipment above its maximum ratings without the operators being aware, potentially causing equipment degradation and failure. Operating below the correct rating in emergencies can also cause undue load shedding and result in incorrect post contingency planning. In this case, the vast majority of the 299 derated Facilities operate at 138 kV. Additionally, an operational review of the Facilities with excessive derates (i.e., between 5% and 30%) identified at least 14 Facilities that had been operated above their true normal Facility Ratings within the past five years. Furthermore, a forward looking evaluation determined that, under certain system conditions, the correct Facility Ratings of at least 16 Facilities could cause operational challenges, including four of the historically overloaded Facilities identified in the operational review. No harm is known to have occurred.

*Mitigating Actions*

17. On February 5, 2019, and June 16, 2020, AEP submitted to ReliabilityFirst Mitigation Plans to address the violation of FAC-009-1 R1. *See* RFCMIT014369 and RFCMIT015143, **Attachments F and G**. On February 6, 2019, and June 18, 2020, ReliabilityFirst accepted the Mitigation Plans.
18. In the Mitigation Plans, AEP committed to take the following actions by February 27, 2020:<sup>7</sup>
  - a. performed Facility Ratings data validation for all of the applicable Facilities in the RF and MRO footprints;
  - b. determined root causes for any derates identified for use in Facility Ratings

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<sup>7</sup> November 13, 2018 was the original completion date prior to the consolidation of the other Facility Ratings issues. After consolidation, the current completion date is February 27, 2020.

- improvements;
- c. corrected all Facility Ratings errors in the RF and MRO footprints;
  - d. implemented a quarterly detective control that samples the previous quarter's inserviced projects' data to verify the facility ratings database matches one-line diagrams, inventory lists, or other applicable source documents; and,
  - e. performed comprehensive review of Facility Ratings process and methodology to identify gaps and reduce likelihood of future Facility Ratings errors, including, for example, updates to the work flows for Transmission Field Services and Transmission Operations (e.g., checklists, periodic reports, etc.) to improve overall Facility Ratings awareness and adherence to the FAC-008 Standard.
19. On July 2, 2019, and August 11, 2020, AEP certified to ReliabilityFirst that it completed these Mitigation Plans as of June 28, 2019, and May 31, 2019. *See* Certifications of Mitigation Plan Completion, **Attachments H and I**. On August 6, 2019, and August 25, 2020, ReliabilityFirst verified AEP completed the Mitigation Plans. *See* Mitigation Plan Verification for RFCMIT014369, and RFCMIT015143, **Attachments J and K**.
20. In addition to the mitigation described above, AEP, serving portions of the MRO, RF and TexasRE Regions is also developing a new detective control to walk-down a minimum of 5% of FAC-008-5 applicable assets on an annual basis. AEP is working on developing and implementing this control and will achieve full implementation of the control in 2023. AEP agrees to implement an approach that is risk-based and aligns with scheduled work to determine how it will prioritize walk-downs of its highest risk facilities. AEP will submit that risk based approach to the Regions for review and approval before full implementation of the control. AEP will provide the Regions with quarterly written updates on the development and implementation of the control through the end of 2024. Beginning in 2025, AEP will provide the Regions with semi-annual written updates on the control until the Regions determine these updates are no longer necessary.
21. AEP agrees to submit self-reports for any additional noncompliances discovered through the quarterly internal detective control described in Paragraphs 18(d) and 20 above.

**B. PRC-023-2 R1 (RFC2018018935)**

22. PRC-023 ensures that protective relay settings do not limit transmission loadability or interfere with system operators' ability to take remedial actions to protect system reliability, and also ensures that protective relays are set to reliably detect all fault conditions and protect the electrical network in response to fault conditions.
23. A violation of PRC-023 R1 has the potential to affect the reliable operation of the

BES by interfering with system operators' ability to take remedial action to protect system reliability.

24. PRC-023-2 R1 states:

**R1.** Each Transmission Owner, Generator Owner, and Distribution Provider shall use any one of the following criteria (Requirement R1, criteria 1 through 13) for any specific circuit terminal to prevent its phase protective relay settings from limiting transmission system loadability while maintaining reliable protection of the BES for all fault conditions. Each Transmission Owner, Generator Owner, and Distribution Provider shall evaluate relay loadability at 0.85 per unit voltage and a power factor angle of 30 degrees.

**Criteria:**

1. Set transmission line relays so they do not operate at or below 150% of the highest seasonal Facility Rating of a circuit, for the available defined loading duration nearest 4 hours (expressed in amperes).

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*Description of Violation and Risk Assessment*

25. On December 21, 2017, and August 2, 2018, AEP submitted Self-Reports to ReliabilityFirst stating that, as a Transmission Owner, it was potentially in violation of PRC-023-2 R1. *See*, Self-Reports, **Attachments L, M, and N**.<sup>8</sup>
26. In these Self-Reports, AEP identified a total of nine instances where the entity's transmission line Relay Trip Limit was not set above 150% of the highest seasonal Facility Rating of a circuit per Criteria 1. These nine instances arose out of upgrades or changes to relays or circuit breakers at various Facilities. When these changes were made, AEP failed to ensure that the transmission line Relay Trip Limits were appropriately adjusted to account for those changes.
27. The root cause for all nine instances was the lack of an internal control to prevent ratings changes without the review and approval of personnel responsible for determining the line relay trip limit and compliance with PRC-023 R1. A major contributing cause was the fact that AEP did not have personnel responsible for determining the line relay trip limit and compliance with PRC-023 R1 serve as an additional check to verify and validate ratings changes before they went into effect. This noncompliance involves the management practices of asset and configuration management, reliability quality management, verification, validation and work

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<sup>8</sup> The two self-reports submitted on August 2, 2018, were initially assigned violation IDs RFC2018020206 and RFC2018020205. Considering the common nature of the violations, and in the interest of clarity, ReliabilityFirst dismissed and consolidated those violations into the current violation.

management.

28. The noncompliance began on April 19, 2013, the date the first instance began when the entity did not perform the relay loadability evaluation in accordance with Criteria 1 and the entity applied and placed in service settings with the Relay Trip Limit being the MLSE of the transmission line. The noncompliance ended on May 25, 2018, the latest date the entity completed revising the relay settings to bring the last of the implicated Facilities back into compliance with PRC-023-2 R1.
29. ReliabilityFirst determined that the violation posed a moderate risk to the reliability of the bulk power system based on the following factors.<sup>9</sup> The potential risk posed by this violation is that the relay could trip too early and thus interfere with the system operators' ability to take remedial action to protect system reliability. The risk is increased because of the number of instances in this noncompliance, the long multiyear duration of four of the instances, and AEP's compliance history with PRC-023. The risk is lessened because at no time during any of the nine instances involved was the line loading more than 66% of the highest seasonal Facility Rating, and at no time did the line loading exceed 74% of the established Relay Trip Limit. The low line loading reduces the risk that a relay could trip too early. No harm is known to have occurred.

*Mitigating Actions*

30. On October 25, 2018, February 7, 2019, and February 8, 2019, and AEP submitted to ReliabilityFirst Mitigation Plans to address the violation of PRC-023-2 R1. *See* RFCMIT014214, RFCMIT014373, and RFCMIT014372, **Attachments O, P, and Q**. On October 28, 2018, ReliabilityFirst accepted the Mitigation Plan.
31. In the Mitigation Plans, the entity committed to take the following actions by November 13, 2018: First, the entity applied revised relay settings for nine reported PRC-023 incidents to bring the Facilities into compliance with PRC-023 R1. Second, the entity reviewed the facilities rating database within the MRO footprint to determine if there were any PRC-023 R1 compliance concerns based on current data.<sup>10</sup> Third, the entity developed a control to prevent ratings changes without the review and approval of personnel responsible for determining the line relay trip limit. Fourth, the entity implemented a control that requires review and approval to allow for ratings changes for PRC-023 applicable Facilities. When an element will result in a Facility Rating change, sign-off will be obtained prior to implementing the change.
32. On November 27, 2018, and February 20, 2019, AEP certified to ReliabilityFirst that it completed these Mitigation Plans as of November 13, 2018, February 1, 2019, and February 7, 2019. *See* Certifications of Mitigation Plan Completion,

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<sup>9</sup> PRC-023-2 R1 has a VRF of "High" pursuant to the VRF Matrix. According to the VSL Matrix, this issue warranted a "Severe" VSL.

<sup>10</sup> The entity also performed a similar review in the RF footprint, but did not formally document that review as a milestone in the Mitigation Plans.

**Attachments R, S, and T.** On January 10, 2019, and March 7, 2019, ReliabilityFirst verified AEP completed the Mitigation Plans on November 13, 2018, and February 7, 2019. *See* Mitigation Plan Verification for RFCMIT014214, RFCMIT014373, and RFCMIT014372, **Attachments U, V, and X.**

**C. FAC-008-3 R6 (RFC2018019116)**

33. FAC-008 ensures that Responsible Entities consider all applicable equipment when developing Facility Ratings and develop Facility Ratings pursuant to an established methodology.
34. A violation of FAC-008 R6 has the potential to affect the reliable operation of the Bulk Electric System by allowing inconsistent Facility Ratings to exist for an entity's solely and jointly owned facilities which could lead to equipment failure.
35. FAC-008-3 R6 states:  
  
**R6.** Each Transmission Owner and Generator Owner shall have Facility Ratings for its solely and jointly owned Facilities that are consistent with the associated Facility Ratings methodology or documentation for determining its Facility Ratings.

*Description of Noncompliance and Risk Assessment*

36. On January 26, 2018, the entity submitted a Self-Report stating that, as a Generator Owner, it was potentially in noncompliance with FAC-008-3 R6. *See* Self-Report, **Attachment Y.**
37. AEPGR performed an engineering review of generators to gather additional documentation to support equipment ratings identified in AEPGR's rating sheets in January 2017.<sup>11</sup> During this review, AEPGR found additional information to specify ratings for associated Isolated Phase Buses (ISO Phase Buses). AEPGR Engineering discovered that ISO bus equipment ratings from Engineering correspondence did not match vendor drawings at Lawrenceburg 1, Lawrenceburg 2, and Waterford 1 Gas Turbine's (GT's).<sup>12</sup> As a result, the GT ISO Phase Bus rating was incorrect for: Lawrenceburg GT1 and GT2 and Waterford GT1, GT2, and GT3. Following from this, AEPGR revised the FAC-008 one-line drawings for the Waterford and Lawrenceburg Combined Cycle (CC) Units to accurately reflect the revised ISO Phase Bus ratings.<sup>13</sup> The revised ISO Phase Bus ratings became the

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<sup>11</sup> AEPGR performed this review due to an upcoming asset sale.

<sup>12</sup> Waterford is approximately 1,100 MVA gross generation for all of its units. Lawrenceburg is approximately 1,400 MVA gross generation for all of its units.

<sup>13</sup> AEPGR acquired the Waterford and Lawrenceburg sites from previous owners in 2005 and 2007 respectively. The element in question, Combustion Turbine Generator ("CTG") ISO bus, was not engineered or constructed by AEPGR and had been built to alternate equipment specifications compared to the rest of AEPGR's engineered and constructed generation Facilities. The transfer of facility design data/drawings from the previous owner was inefficient, limiting engineering's ability to obtain accurate equipment ratings. The MLSE Ratings at the time were established consistent with AEPGR's methodology for other generator units in its fleet utilizing information available at that time. The

Most Limiting Series Element (MLSE) for these combined cycle GT MVA ratings during the summer and winter at Lawrenceburg 1 and 2, and the summer for Waterford 1. The revised ISO Phase Bus ratings resulted in relatively minor derates at Lawrenceburg 1 and 2 and at Waterford 1.<sup>14</sup>

38. AEPGR conducted an extent of condition on all ISO Phase Bus ratings fleet wide and found no other issues.
39. This noncompliance involves the management practices of verification and validation. AEPGR did not verify and validate that all equipment specification was correct, which led to incorrect equipment ratings and an incorrect MLSE being identified on the Lawrenceburg and Waterford units. AEPGR did not have an effective internal control in place to verify and validate relevant equipment specifications and that lack of an effective internal control is a contributing cause of this noncompliance.
40. The noncompliance began on January 1, 2014,<sup>15</sup> the date AEPGR was required to comply with FAC-008-3 R6 and ended on January 27, 2017, the date AEPGR completed updating all ratings for impacted ISO Phases Buses.
41. This noncompliance posed a moderate risk and did not pose a serious or substantial risk to the reliability of the bulk power system based on the following factors.<sup>16</sup> The risk posed by this noncompliance is potential damage to the ISO Phase Bus and potential loss of the generating units if the units were operated at an output that exceeded the ratings of the ISO Phase Bus. The risk is not minimal because of the long more than three year duration of the noncompliance and the revised ISO Phase Bus ratings became the MLSE for the combined cycle GT MVA ratings during the summer and winter at Lawrenceburg 1 and 2 and the summer for Waterford 1. The risk is not serious because although the revised ISO Phase Bus ratings in some cases became the MLSE, the ratings changes at both facilities were relatively minor. The ratings at Lawrenceburg 1 and 2 decreased approximately 5% and the rating at Waterford decreased approximately 17%. Additionally, this noncompliance is isolated to just the Waterford and Lawrenceburg sites which AEPGR acquired from previous owners in 2005 and 2007 respectively. The ISO Phase Buses at the Waterford and Lawrenceburg sites were not engineered or constructed by AEPGR and had been built to alternate equipment specifications compared to the rest of AEPGR's engineered and constructed generation Facilities. AEPGR conducted an

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specific equipment drawings were not evaluated or identified until AEPGR performed a pre-sale equipment review. The Steam Turbine Generators associated with each of the three CC Units have larger MVA ratings than the Gas Turbine Generators. AEPGR has since sold both the Waterford and Lawrenceburg sites to Lightstone Generation.

<sup>14</sup> The ratings at Lawrenceburg 1 and 2 decreased approximately 5% and the rating at Waterford decreased approximately 17%.

<sup>15</sup> Per discussion with ReliabilityFirst, this Self-Report has an incident date of June 18, 2007. However, due to AEPGR not becoming registered until January 1, 2014, the start date of this violation is January 1, 2014. Following from this start date, the Reliability Standard violated is FAC-008-3 R6.

<sup>16</sup> FAC-008-3 R6 has a VRF of "Medium" pursuant to the VRF Matrix. According to the VSL Matrix, this issue warranted a "Lower" VSL.

extent of condition on all ISO Phase Bus ratings fleet wide and found no other issues. Lastly, ReliabilityFirst notes that AEPGR operational data shows that generation was never impacted by powerflows through the ISO Phase Bus during the noncompliance. No harm is known to have occurred.

*Mitigating Actions*

42. On May 1, 2018, the entity submitted to ReliabilityFirst a Mitigation Plan to address the subject noncompliance with FAC-008-3 R6. *See* Mitigation Plan RFCMIT013646-1, **Attachment Z**. On May 7, 2018, ReliabilityFirst accepted the Mitigation Plan.
43. In the Mitigation Plan, the entity committed to take the following actions by September 29, 2017: First, AEPGR contacted plant and manufacturer to verify that equipment specification data is correct. AEP conducted a review of drawings and associated specifications and updated as needed to correct any discrepancies. Any updates would initiate a review of MLSE results with an Engineering analysis to verify the accuracy of the MLSE. Second, AEPGR performed a comprehensive review of ISO Phase Bus ratings for all AEP generating units. AEPGR reviewed one-lines, vendor drawings, bill of materials and spec sheets to verify the ISO Phase Bus ampacity ratings. The results of this activity did not reveal any findings or situations where the MLSE would need to be revised. Third, AEPGR established a Preventative Control to ensure any changes to equipment must obtain director level review and sign-off from all applicable engineering disciplines prior to the initiation of a project or work. This is to ensure that the equipment and documentation is in alignment with NERC requirements and methodologies. The FAC-008 one-lines and MLSE are reviewed on a case by case basis when there is a change to the equipment to properly consider identifying and reporting the MLSE.
44. On May 1, 2018, the entity certified to ReliabilityFirst that it completed this Mitigation Plan as of June 1, 2017. *See* Certification of Mitigation Plan Completion, **Attachment AA**. On August 27, 2018, ReliabilityFirst verified that the entity completed this Mitigation Plan on June 1, 2017. *See*, Mitigation Plan Verification for RFCMIT013646-1, **Attachment BB**.

**IV. ADJUSTMENT FACTORS**

45. In addition to the facts and circumstances stated above, the Regions considered the following factors in its penalty determination.

*Compliance History*

46. When assessing the penalty for the Alleged Violation at issue in this Agreement, the Regions considered whether the facts of this Alleged Violation constitute repetitive infractions. AEP's relevant prior noncompliances with FAC-009-1 R1 include RFC200800072, RFC2011001049, RFC2012010148, RFC2015014576, and RFC2016016427. Because RFC2015014576 and RFC2016016427 arose from

root causes that are substantially similar to those at issue in the current case, the Regions considered these prior noncompliances to be aggravating factors. AEP's relevant prior noncompliances with PRC-023-2 R1 include RFC2011001069, RFC2015014577, and RFC2016016049. Because RFC2011001069 and RFC2015014577 arose from root causes that are substantially similar to those at issue in the current case, the Regions considered these prior noncompliances to be aggravating factors.

*Cooperation*

47. AEP has been highly cooperative throughout the entire enforcement process. Following the self-report of the Alleged Violation, AEP met with the Regions on a regular basis to discuss progress on mitigation, the effectiveness of its extent of condition review, reliability, and other related activities. Throughout the enforcement process, AEP voluntarily provided the Regions with an abundance of information regarding the Alleged Violation in a manner that was detailed, well-organized and timely. AEP has been transparent with the Regions regarding the Alleged Violation and AEP's processes and systems, and this insight has allowed the Regions to better analyze the Alleged Violation and assist AEP with resolving the same. AEP's level of cooperation throughout the enforcement process has been exemplary and the Regions awarded mitigating credit for this level of cooperation to encourage this sort of response by other Registered Entities in the future.

*Self-Disclosure*

48. Effective oversight of the reliability of the BES depends on robust and timely self-reporting by Registered Entities. AEP self-reported the Alleged Violations and the issue was identified prior to the occurrence of any harm. However, the Regions also considered the fact that AEP's discovery of the Alleged Violations was due, at least in part, to mitigating actions it undertook to mitigate other issues identified through the compliance monitoring process. Consequently, the Regions applied some mitigating credit.

**V. PENALTY**

49. Based upon the foregoing, AEP shall pay a monetary penalty of \$570,000 to the Regions. AEP shall pay \$570,000 to ReliabilityFirst, and ReliabilityFirst shall divide that penalty amount in two parts based on the relative net energy for load ("NEL") for each Region<sup>17</sup> and shall distribute the NEL-based proportional allocation to MRO. Of the total penalty remitted, ReliabilityFirst shall distribute \$188,100 to MRO.

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<sup>17</sup> NEL is published in NERC's annual business plan and budget and is used as a method to prorate fee assessments pursuant to the Regional Entity Coordinated Oversight Memorandum of Understanding among the Regions. The calculation used for this Agreement is based on the NERC 2020 budget, which indicates the following NEL values in the ERO: ReliabilityFirst: 22.529%; and MRO: 10.938%. For the purposes of penalty calculation in this Agreement, the NEL values correspond to weighted penalties of 67% to ReliabilityFirst and 33% to MRO.

50. ReliabilityFirst shall present an invoice to AEP within 20 days after the Agreement is approved by the Commission or affirmed by operation of law. Upon receipt, AEP shall have 30 days to remit payment. ReliabilityFirst will notify NERC if it does not timely receive the payment from AEP.
51. If AEP fails to timely remit the monetary penalty payment to ReliabilityFirst, interest will commence to accrue on the outstanding balance, pursuant to 18 C.F.R. § 35.19a (a)(2)(iii), on the earlier of (a) the 31<sup>st</sup> day after the date on the invoice issued by ReliabilityFirst to AEP for the monetary penalty payment or (b) the 51<sup>st</sup> day after the Agreement is approved by the Commission or operation of law.

## **VI. ADDITIONAL TERMS**

52. The Parties agree that this Agreement is in the best interest of BES reliability. The terms and conditions of the Agreement are consistent with the regulations and orders of the Commission and the NERC Rules of Procedure.
53. ReliabilityFirst shall report the terms of all settlements of compliance matters to NERC. NERC will review the Agreement for the purpose of evaluating its consistency with other settlements entered into for similar violations or under similar circumstances. Based on this review, NERC will either approve or reject this Agreement. If NERC rejects the Agreement, NERC will provide specific written reasons for such rejection and ReliabilityFirst will attempt to negotiate with AEP a revised settlement agreement that addresses NERC's concerns. If a settlement cannot be reached, the enforcement process will continue to conclusion. If NERC approves the Agreement, NERC will (a) report the approved settlement to the Commission for review and approval by order or operation of law and (b) publicly post the violations and the terms provided for in this Agreement.
54. This Agreement binds the Parties upon execution, and may only be altered or amended by written agreement executed by the Parties. AEP expressly waives its right to any hearing or appeal concerning any matter set forth herein, unless and only to the extent that AEP contends that any NERC or Commission action constitutes a material modification to this Agreement.
55. ReliabilityFirst reserves all rights to initiate enforcement action against AEP in accordance with the NERC Rules of Procedure in the event that AEP fails to comply with any of the terms or conditions of this Agreement. AEP retains all rights to defend against such action in accordance with the NERC Rules of Procedure.
56. AEP consents to ReliabilityFirst's future use of this Agreement for the purpose of assessing the factors within the NERC Sanction Guidelines and applicable Commission orders and policy statements, including, but not limited to, the factor evaluating AEP's history of violations. Such use may be in any enforcement action or compliance proceeding undertaken by NERC or any Regional Entity or both, provided however that AEP does not consent to the use of the conclusions,

determinations, and findings set forth in this Agreement as the sole basis for any other action or proceeding brought by NERC or any Regional Entity or both, nor does AEP consent to the use of this Agreement by any other party in any other action or proceeding.

57. AEP affirms that all of the matters set forth in this Agreement are true and correct to the best of its knowledge, information, and belief, and that it understands that ReliabilityFirst enters into this Agreement in express reliance on the representations contained herein, as well as any other representations or information provided by AEP to ReliabilityFirst during any AEP interaction with ReliabilityFirst relating to the subject matter of this Agreement.
58. Upon execution of this Agreement, the Parties stipulate that each Possible violation addressed herein constitutes a violation [as provided by Section 5.4 of the CMEP](#). The Parties further stipulate that all required, applicable information listed in Section 5.3 of the CMEP is included within this Agreement.
59. Each of the undersigned agreeing to and accepting this Agreement warrants that he or she is an authorized representative of the party designated below, is authorized to bind such party, and accepts the Agreement on the party's behalf.
60. The undersigned agreeing to and accepting this Agreement warrant that they enter into this Agreement voluntarily and that, other than the recitations set forth herein, no tender, offer, or promise of any kind by any member, employee, officer, director, agent, or representative of the Parties has been made to induce the signatories or any other party to enter into this Agreement.
61. The Agreement may be signed in counterparts.
62. This Agreement is executed in duplicate, each of which so executed shall be deemed to be an original.

**[SIGNATURE PAGE TO FOLLOW]<sup>18</sup>**

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<sup>18</sup> An electronic version of this executed document shall have the same force and effect as the original.



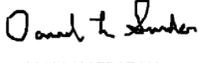
**ENDORSED BY:**

\_\_\_\_\_  
Niki Schaefer  
General Counsel and Vice President  
ReliabilityFirst Corporation

\_\_\_\_\_  
Date

**AGREED TO AND ACCEPTED BY:**

**American Electric Power Service Corporation, and AEP Generation Resources Inc.**

**DocuSigned by:**  
  
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\_\_\_\_\_  
Daniel Snider  
Vice President NERC Compliance  
American Electric Power Service Corporation, and AEP Generation Resources Inc.

9/28/2021 | 9:08 AM EDT

\_\_\_\_\_  
Date

**ReliabilityFirst Corporation**

\_\_\_\_\_  
Timothy R. Gallagher  
President & Chief Executive Officer  
ReliabilityFirst Corporation

\_\_\_\_\_  
Date

## Self Report

Entity Name: American Electric Power Service Corporation [ Legal name see comment below] (AEP)

NERC ID: NCR00682

Standard: FAC-009-1

Requirement: FAC-009-1 R1.

Date Submitted: August 02, 2018

Has this violation previously No  
been reported or discovered?:

Entity Information:

Joint Registration  
Organization (JRO) ID:

Coordinated Functional  
Registration (CFR) ID:

Contact Name: Darrel Grumman

Contact Phone: 6147162362

Contact Email: dgrumman@aep.com

Violation:

Violation Start Date: June 18, 2007

End/Expected End Date: May 18, 2018

Reliability Functions: Transmission Owner (TO)

Is Possible Violation still No  
occurring?:

Number of Instances: 1

Has this Possible Violation Yes  
been reported to other  
Regions?:

Which Regions: MRO

Date Reported to Regions: August 02, 2018

Detailed Description and Cause of Possible Violation: On 5/11/2018, AEP discovered that the Facility Rating on the Arsenal Hill - Lieberman 138 kV Facility was erroneous due to an incorrect amp switch in the Facility Ratings database. AEP decided to proactively validate all of its Facility Ratings in MRO after discovering a Facility Ratings issue in another Region, which is how the issue was identified. The Facility Ratings database indicated that there were 1200 amp switches comprising the Facility; however, after field verification, it was discovered that the switches were actually 600 amp, which became the most limiting series element.

At this time, the cause of this incident has been determined to be the original MLSE drawing of the station incorrectly specifying 1200 amp switches.

Since the incident was discovered, the Facility Ratings database was updated, the updated Facility Ratings have been published, and the drawings were updated to reflect the 600 amp switches.

An update on the extent of condition will follow the submittal of the Self-Report.

Mitigating Activities:

The condition was mitigated by a rating change on May 18, 2018, reflecting the

Self Report

Description of Mitigating new MLSE. An extent of condition review is also being performed in the MRO Activities and Preventative Region.  
 Measure:

Date Mitigating Activities May 18, 2018  
 Completed:

**Impact and Risk Assessment:**

Potential Impact to BPS: Minimal

Actual Impact to BPS: Minimal

Description of Potential and Actual Impact to BPS: The violation posed a minimal risk and did not pose a serious or substantial risk to the reliability of the bulk power system (BPS). While an incorrect Facility Rating could result in errors in the planning and operational models and possible equipment damage or reduced equipment lifetimes, the line loading data showed the equipment remained at or below 120 MVA, thus well under the corrected rating of 156 MVA Summer normal.

Risk Assessment of Impact to BPS: The violation posed a minimal risk and did not pose a serious or substantial risk to the reliability of the bulk power system (BPS). While an incorrect Facility Rating could result in errors in the planning and operational models and possible equipment damage or reduced equipment lifetimes, the line loading data showed the equipment remained at or below 120 MVA, thus well under the corrected rating of 156 MVA Summer normal.

Additional Entity Comments: Please note that this incident is MRO impacting ONLY begin reported via RF as the lead MRRE.

Additional Comments		
From	Comment	User Name
No Comments		

Additional Documents			
From	Document Name	Description	Size in Bytes
No Documents			

### Self Report

Entity Name: American Electric Power Service Corporation [ Legal name see comment below] (AEP)

NERC ID: NCR00682

Standard: FAC-009-1

Requirement: FAC-009-1 R1.

Date Submitted: February 11, 2020

Has this violation previously No  
been reported or discovered?:

### Entity Information:

Joint Registration  
Organization (JRO) ID:

Coordinated Functional  
Registration (CFR) ID:

Contact Name: Steve Globeck

Contact Phone: 6147162374

Contact Email: sjglobeck@aep.com

### Violation:

Violation Start Date: June 18, 2007

End/Expected End Date: June 17, 2019

Reliability Functions: Transmission Owner (TO)

Is Possible Violation still No  
occurring?:

Number of Instances: 1

Has this Possible Violation No  
been reported to other  
Regions?:

Which Regions:

Date Reported to Regions:

Detailed Description and Cause of Possible Violation: On May 29, 2019, as a result of a field visit to perform a wavetrapp replacement at Tulsa North Station, the AEP Transmission Station Design team discovered that there were two lines with 600 amp switches at the station instead of the 1200 amp switches shown on the drawings. Since the switches are estimated to be 30 to 40 years old, this incident has been occurring since the start of compliance for facility ratings, June 18, 2007.

The cause of this incident has been determined to be improper recordkeeping of material substitution and a lack of control to ensure equipment in the field matches the facility ratings database.

### Mitigating Activities:

Description of Mitigating Activities and Preventative Measure: Since the incident was discovered, facility rating derates for the switches (from 1200 A to 600 A) were submitted by AEP Transmission Planning internally to AEP Transmission Operations and externally to SPP RTO on June 17, 2019.

Additionally, AEP has been working to improve its FAC-008-3 policies, processes, work-flows, and guidelines over the past year.

## Self Report

Date Mitigating Activities June 17, 2019  
Completed:

Impact and Risk Assessment:

Potential Impact to BPS: Minimal

Actual Impact to BPS: Minimal

Description of Potential and Actual Impact to BPS: The violation posed a minimal risk and did not pose a serious or substantial risk to the reliability of the bulk power system (BPS). While an incorrect Facility Rating could result in errors in the planning and operational models and possible equipment damage or reduced equipment lifetimes, the equipment remained fully operational without any damage or effect on the BPS.

An extensive review revealed that if the switches would have been rated at 600 A instead of 1200 A, the two lines impacted by the switches would have been overloaded a total of 4 times. The Tulsa North to Northeastern Station line would have been overloaded three times. In 2009, the line would have been overloaded for 2 minutes and 38 seconds. In 2017, if the same switch would have been rated at 600 A the Tulsa North to Northeastern line would have been overloaded on two occasions, totaling 2 hours and 25 minutes. If the second switch would have been rated at 600 A in 2010, the Tulsa North to Wekiwa line would have been overloaded for 1 hour and 30 minutes.

For all 4 instances, the switches were rated at 1200 A and there was no damage to equipment or impact to the BPS.

Both the Tulsa North to Wekiwa line and the Tulsa North to Northeastern Station line are 138 kV within the extensive Tulsa transmission network. The Tulsa North to Wekiwa line has minimal load connected. The Tulsa North to Northeastern Station line does not have any connected load. In addition, there is a 345 kV transmission network around the Tulsa area that provides system stability. In the event that the switches were overloaded to the point of failure the overall impact due to the loss of these lines would be minimal with no system instability.

Risk Assessment of Impact to BPS: The violation posed a minimal risk and did not pose a serious or substantial risk to the reliability of the bulk power system (BPS). While an incorrect Facility Rating could result in errors in the planning and operational models and possible equipment damage or reduced equipment lifetimes, the equipment remained fully operational without any damage or effect on the BPS.

An extensive review revealed that if the switches would have been rated at 600 A instead of 1200 A, the two lines impacted by the switches would have been overloaded a total of 4 times. The Tulsa North to Northeastern Station line would have been overloaded three times. In 2009, the line would have been overloaded for 2 minutes and 38 seconds. In 2017, if the same switch would have been rated at 600 A the Tulsa North to Northeastern line would have been overloaded on two occasions, totaling 2 hours and 25 minutes. If the second switch would have been rated at 600 A in 2010, the Tulsa North to Wekiwa line would have been overloaded for 1 hour and 30 minutes.

For all 4 instances, the switches were rated at 1200 A and there was no damage to equipment or impact to the BPS.

Both the Tulsa North to Wekiwa line and the Tulsa North to Northeastern Station line are 138 kV within the extensive Tulsa transmission network. The Tulsa North to Wekiwa line has minimal load connected. The Tulsa North to Northeastern Station line does not have any connected load. In addition, there is a 345 kV transmission network around the Tulsa area that provides system stability. In the event that the switches were overloaded to the point of failure the overall impact due to the loss of these lines would be minimal with no system instability.

Only affects MRO.

Self Report

Additional Entity Comments: [MRO]AEP PCI-2506

Additional Comments		
From	Comment	User Name
No Comments		

Additional Documents			
From	Document Name	Description	Size in Bytes
Entity	PSO_KREMLIN_UPDATE_06 1719.pdf		177,684
Entity	SPP Submission.pdf		978,085

## Self Report

Entity Name: American Electric Power Service Corporation [ Legal name see comment below] (AEP)

NERC ID: NCR00682

Standard: FAC-009-1

Requirement: FAC-009-1 R1.

Date Submitted: June 19, 2020

Has this violation previously No  
been reported or discovered?:

Entity Information:

Joint Registration  
Organization (JRO) ID:

Coordinated Functional  
Registration (CFR) ID:

Contact Name: Stephen Globeck

Contact Phone: 6147162374

Contact Email: sjglobeck@aep.com

Violation:

Violation Start Date: June 18, 2007

End/Expected End Date:

Reliability Functions: Generator Owner (GO)  
Transmission Owner (TO)

Is Possible Violation still No  
occurring?:

Number of Instances: 1

Has this Possible Violation No  
been reported to other  
Regions?:

Which Regions:

Date Reported to Regions:

Detailed Description and Cause of Possible Violation: On May 29, 2019, as a result of a field visit to perform an assessment of upcoming construction at Tulsa Power Station Transmission switchyard, the AEP Transmission Station Design team discovered that there was a 600A disconnect (Designated 1307) associated with Tulsa Unit 4 138kV Generator CB (Circuit Breaker) that was improperly rated at 1200A in the AEP facility Transmission ratings database. The CB and disconnect are located in the AEP Transmission substation yard beyond the established point of interconnection (POI), which is defined as the connection point of Unit 4 138kV conductor run attached to the 138kV bus work in the AEP Transmission yard between 138kV switches 1307 and 1308 (EV-16183, EV-16251) . The switch is estimated to be 30 to 40 years old so this incident has been occurring since the start of compliance for facility ratings, June 18, 2007.

At this time, the cause of the incident has been determined to be unclear delineation of ownership and corresponding compliance obligations between AEP Generation and AEP Transmission at the interconnects which led to inadequate field verifications of element ratings and incorrect assumptions accepting legacy values within existing AEP Transmission facility ratings databases for limiting element calculations. It was also determined from pre-merger documentation (prior to 2001) that the switch rating was recorded as having a 1200A rating (EV-16251).

## Self Report

Mitigating Activities:

Description of Mitigating Activities and Preventative Measure: Since the incident was discovered, a de-rate to Tulsa Unit 4 Generator was submitted by AEP planning to AEP Transmission Operations and communicated to Tulsa Unit 4 Generator Operations (EV-16154) on June 17, 2019. The de-rate was due to the switch being the most limiting series element (MLSE) identified as 600 A instead of 1200 A. Actions were taken on July 3, 2019 to replace the 600A device with the appropriately rated 1200A device and information was updated in the AEP Transmission facility ratings database (EV-16182) and the Generation FAC-008 rating one-line (EV-16251) unit de-rate was lifted on July 4, 2019 (EV-16178).

## On-going FAC-008 Mitigating Activities

## Transmission:

There are FAC-008 mitigating activities happening within AEP Transmission that address both existing assets and new construction. The new construction initiatives are summarized in the following evidence folder (EV-16244).

Transmission Planning has been actively involved in an effort to validate existing Transmission assets as part of a larger mitigating activity and specifics can be provided upon request.

## Generation:

## Preventative Measures (future work):

The current process for changing of Generation equipment that impact FAC-008 is QAS (Quality Assurance) document for project initiation procedure that provides a NERC review and GEIP sign off.

## Corrective Actions:

- 1.Walk downs of SPP region generators from Generator to POI (Point of Interface) to verify equipment ratings with Engineering drawings to start in May 2020 (Delayed to COVID).
- 2.Other AEP fleet to follow SPP region (item 1).
- 3.Revising Engineering issued drawings to reflect Item 1 and 2 findings to be used as source document for Generation FAC-008 methodology.

Date Mitigating Activities Completed:

Impact and Risk Assessment:

Potential Impact to BPS: Minimal

Actual Impact to BPS: Minimal

Description of Potential and Actual Impact to BPS: The violation posed a minimal risk and did not pose a serious or substantial risk to the reliability of the Bulk Electric Power System (BPS). While an incorrect Facility Rating could result in an error in the planning and operational models and possible equipment damage or reduced equipment lifetimes, the disconnect switch remained fully operational without any damage or adverse effect on the BPS during the devices 30 to 40 years of operation.

The overload condition created a situation where the switch could have welded shut due to the thermal effect from heavy sustained current. This means the switch would have become inoperable and additional measures would be needed to manually isolate devices around this equipment to allow repairs to be made. With this scheme, no additional equipment would be required to be isolated on the Transmission system accept the 138kV circuit breaker (EV-16183), which is a series element, designated to protect and/or parallel and/or bring the unit off-line.

Tulsa #4 unit was rated at a maximum output of 216 MVA. This output is minimal based on the amount of generation in the Eastern Interconnection. In

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Self Report

the event of a failure of the switch, the unit would have to be removed from service so that the switch could be replaced, resulting in a minimal loss of generation to the AEP system.

Risk Assessment of Impact to BPS: The potential risk posed by this instance of potential non-compliance was determined to be minor due to the unit being identified as a black-start resource and any disruption to this resource would have an impact on system restoration efforts. All other risk was minimal due to the potential no impact and remote likelihood given the fact that this device (In-line switch) is a rigid structure that would not sag due to overload and the insulators associated with the device were appropriately rated. The physical risk was the contact points of the switch welding shut which would inhibit the ability to operate the switch for unit isolation. Catastrophic failure of this series element would have resulted in the unit tripping off line via the normal zone of protection.

The actual risk posed by this instance of potential non-compliance was determined to be minimal due to the potential no impact and remote likelihood of the unit tripping due to loading the switch above the normal rating. Had the unit tripped due to a failure that resulted from overloading the switch, the impact to the BPS would be minimum due to the unit maximum output capability being less than 300MVA. The disconnect switch being located between the Unit and the Unit 138kV CB means that failure of this device would only trip the associated unit run and would not trip additional Transmission equipment, which minimizes the impact to the BPS.

The unit operating at the maximum output of 216MVA would place a 600A switch at 138% above the Summer normal switch rating. AEP has rating expectations based on IEEE standards and equipment performance and the AEP rating for a 600A switch in the West region is 652A Summer normal and 787A Winter normal (EV-16177). This equates to 156MVA Summer and 188MVA Winter normal (EV-16171). A two year review of the actual overload condition from time of discovery revealed that the overloads during normal operation were short in duration. The prolonged overload exposure could have resulted in metal fatigue and eventual failure.

Additional Entity Comments: [MRO] AEP - PCI-2567

AEP Transmission had established operational and maintenance agreements with AEP Generation's Tulsa Plant (EV-16242, EV-16241, EV-16240), but had not completed an official agreement on asset ownership or obligations for compliance tasks associated with the point of interconnection (POI). The existing AEP Transmission documentation was not officially signed by Generation and the most recent efforts to establish asset ownership and responsibilities have been occurring since late 2019 (EV-16241).

It is AEP's position that had an official interface agreement existed between AEP Transmission and AEP's Tulsa Plant with designated asset ownership and defined compliance obligations, that the on-going mitigating FAC-008 activities being performed by Transmission and Generation would have resolved this earlier. It is also recognized that, regardless of ownership or FAC-008 initiatives, this would have still been a reportable incident because the asset was improperly classified since its installation, well before FAC-008 enforcement went into effect.

The completion of interface agreements between AEP's internal entities is an on-going effort and is understood that it will improve FAC-008 adherence by clearly defining asset ownership and responsibilities for maintenance, operation and compliance.

## Self Report

Additional Comments		
From	Comment	User Name
No Comments		

Additional Documents			
From	Document Name	Description	Size in Bytes
Entity	EV-16154_TPS_Tulsa North Switches.xlsx	EV-16154	13,205
Entity	EV-16171_West Switch Equipment Ratings.png	EV-16171	218,776
Entity	EV-16177_SS-763010 - Published Standard.pdf	EV-16177	181,997
Entity	EV-16178_SCC Log 05-29-19.pdf	EV-16178	104,614
Entity	EV-16182_Revised Switch Rating.png	EV-16182	33,800
Entity	EV-16183_Tulsa PS_Print.JPG	EV-16183	128,223
Entity	EV-16240_Tulsa Power Station Interface_Agreement Draft 4-21-2020.docx	EV-16240	570,417
Entity	EV-16241_TPS Equipment OM Agreement rev 2019_.doc	EV-16241	766,464
Entity	EV-16242_TPS Attachment A Responsibilities 02-25-2020 doc.xls	EV-16242	76,288
Entity	EV-16244_Transmission FAC-008 Initiatives_New Construction_.docx	EV-16244	19,413
Entity	EV-16251_TPS4 Switch 1307 Rating.pptx	EV-16251	843,551

## Self Report

Entity Name: American Electric Power Service Corporation [ Legal name see comment below] (AEP)

NERC ID: NCR00682

Standard: FAC-009-1

Requirement: FAC-009-1 R1.

Date Submitted: July 14, 2020

Has this violation previously No  
been reported or discovered?:

Entity Information:

Joint Registration  
Organization (JRO) ID:

Coordinated Functional  
Registration (CFR) ID:

Contact Name: Stephen Globeck

Contact Phone: 6147162374

Contact Email: sjglobeck@aep.com

Violation:

Violation Start Date: June 18, 2007

End/Expected End Date:

Reliability Functions: Transmission Owner (TO)

Is Possible Violation still No  
occurring?:

Number of Instances: 1

Has this Possible Violation No  
been reported to other  
Regions?:

Which Regions:

Date Reported to Regions:

Detailed Description and Cause of Possible Violation: On February 7, 2020, as a result of data quality checks, AEP Transmission Engineering and Planning validated that there was an undocumented series reactor on the Buckeye Steel - Gay Street 138 kV circuit, where the line transitions from overhead to underground. This incident has been occurring since June 18, 2007, the start of compliance for facility ratings. This was considered as potential noncompliance of FAC-009-1 R1 and FAC-008-3 R6 (current version).

The cause of this incident has been determined to be insufficient review performed on this facility during the extent of condition review (MP-224). The unusual physical location of the series reactor contributed to it being overlooked during the review. It is in a cramped and crowded station in the middle of the circuit that only acts as a pass through riser for the particular circuit with no other electrical connections.

Mitigating Activities:

Description of Mitigating Activities and Preventative Measure: Since the incident was discovered, the facility ratings were updated in Kremlin on February 24, 2020, and AEP Transmission Operations updated their model with the new ratings and submitted the change to PJM on February 27, 2020. Additionally, a proactive review of the area series reactors was completed with no additional concerns discovered.

Self Report

Date Mitigating Activities February 27, 2020  
Completed:

**Impact and Risk Assessment:**

Potential Impact to BPS: Minimal

Actual Impact to BPS: Minimal

Description of Potential and Actual Impact to BPS: The potential risk and actual risk to the BES was minimal in this case. The Facility Rating required a derate of 4.4%. During the incident time period, power flow on this line never exceeded 100 MVA, except for some random, momentary spikes shown in the loading data on ADX. Additionally, Buckeye Steel's other 138-kV source is from Bixby Station which has plenty of capacity to stub feed Buckeye Steel's plant load on its own.

Risk Assessment of Impact to BPS: The potential risk and actual risk to the BES was minimal in this case. The Facility Rating required a derate of 4.4%. During the incident time period, power flow on this line never exceeded 100 MVA, except for some random, momentary spikes shown in the loading data on ADX. Additionally, Buckeye Steel's other 138-kV source is from Bixby Station which has plenty of capacity to stub feed Buckeye Steel's plant load on its own.

Additional Entity Comments: [RFC] AEP: PCI-2675

Additional Comments		
From	Comment	User Name
No Comments		

Additional Documents			
From	Document Name	Description	Size in Bytes
Entity	RE Kremlin Production Update Notification - Workorder 8150.msg	Action described in the 'Description of Mitigating Activities and Preventative Measure' section.	79,360

## Self Report

Entity Name: American Electric Power Service Corporation [ Legal name see comment below] (AEP)

NERC ID: NCR00682

Standard: FAC-008-3

Requirement: FAC-008-3 R6.

Date Submitted: July 01, 2019

Has this violation previously No  
been reported or discovered?:

Entity Information:

Joint Registration  
Organization (JRO) ID:

Coordinated Functional  
Registration (CFR) ID:

Contact Name: Darrel A Grumman

Contact Phone: 6147162362

Contact Email: dgrumman@aep.com

Violation:

Violation Start Date: May 18, 2018

End/Expected End Date: November 14, 2018

Reliability Functions: Transmission Owner (TO)

Is Possible Violation still No  
occurring?:

Number of Instances: 1

Has this Possible Violation No  
been reported to other  
Regions?:

Which Regions:

Date Reported to Regions:

Detailed Description and Cause of Possible Violation: On October 19th, 2018, during a combined training/station review session, an AEP employee discovered that the Saltville - Tazewell 138 kV Circuit and the Tazewell - Trail Fork 138 kV Circuit were inadvertently left un-six-wired for the first span on both circuits near Tazewell Station. Once the incorrect design was discovered, it was realized that the circuits were operating with the incorrect facility ratings documented. For the Saltville - Tazewell 138 kV Circuit, the circuit operated with the incorrect ratings from May 18, 2018 until October 22, 2018. For the Tazewell - Trail Fork 138 kV Circuit, the circuit operated with the incorrect ratings from August 2, 2018 until October 22, 2018.

The cause of this incident has been determined to be the issued drawings did not include the six-wire design for the circuits, and thus they were not built accordingly. AEP Transmission Planning developed the ratings based on the original project plan, which included the six-wire design.

Mitigating Activities:

Description of Mitigating Activities and Preventative Measure: AEP issued a temporary derate on both circuits on October 22, 2018. On November 14, 2018, circuit ties were installed to correct the design and the ratings were restored for both circuits.

## Self Report

Date Mitigating Activities Completed: November 14, 2018

### Impact and Risk Assessment:

Potential Impact to BPS: Minimal

Actual Impact to BPS: Minimal

Description of Potential and Actual Impact to BPS: For the Saltville - Tazewell Circuit:

The violation posed a minimal risk and did not pose a serious or substantial risk to the reliability of the bulk power system (BPS). While an incorrect Facility Rating could result in errors in the planning and operational models and possible equipment damage or reduced equipment lifetimes, the line loading data showed the equipment remained at or below 122.5 MVA, except for a momentary spike on September 2, 2018 when it operated at approximately 156.7 MVA and was estimated to last 56 seconds. This was due to a momentary lightning fault on the Baileysville - Trail Fork 138 kV Circuit. This was the only occurrence the circuit operated above the corrected rating of 151 MVA Summer normal.

For the Tazewell - Trail Fork line:

The violation posed a minimal risk and did not pose a serious or substantial risk to the reliability of the bulk power system (BPS). While an incorrect Facility Rating could result in errors in the planning and operational models and possible equipment damage or reduced equipment lifetimes, the line loading data showed the equipment remained at or below 90.5 MVA, except for a momentary spike on September 2, 2018 when it operated at approximately 156.7 MVA and was estimated to last 56 seconds. This was due to a momentary lightning fault on the Baileysville - Trail Fork 138 kV Circuit. The circuit never operated above the corrected rating of 167 MVA Summer normal.

Risk Assessment of Impact to BPS: For the Saltville - Tazewell Circuit:

The violation posed a minimal risk and did not pose a serious or substantial risk to the reliability of the bulk power system (BPS). While an incorrect Facility Rating could result in errors in the planning and operational models and possible equipment damage or reduced equipment lifetimes, the line loading data showed the equipment remained at or below 122.5 MVA, except for a momentary spike on September 2, 2018 when it operated at approximately 156.7 MVA and was estimated to last 56 seconds. This was due to a momentary lightning fault on the Baileysville - Trail Fork 138 kV Circuit. This was the only occurrence the circuit operated above the corrected rating of 151 MVA Summer normal.

For the Tazewell - Trail Fork line:

The violation posed a minimal risk and did not pose a serious or substantial risk to the reliability of the bulk power system (BPS). While an incorrect Facility Rating could result in errors in the planning and operational models and possible equipment damage or reduced equipment lifetimes, the line loading data showed the equipment remained at or below 90.5 MVA, except for a momentary spike on September 2, 2018 when it operated at approximately 156.7 MVA and was estimated to last 56 seconds. This was due to a momentary lightning fault on the Baileysville - Trail Fork 138 kV Circuit. The circuit never operated above the corrected rating of 167 MVA Summer normal.

Self Report

Additional Entity Comments:

Additional Comments		
From	Comment	User Name
No Comments		

Additional Documents			
From	Document Name	Description	Size in Bytes
No Documents			

### Mitigation Plan

#### Mitigation Plan Summary

Registered Entity: American Electric Power Service Corporation [ Legal name see comment below]

Mitigation Plan Code: RFCMIT014369

Mitigation Plan Version: 1

NERC Violation ID	Requirement	Violation Validated On
RFC2018020207	FAC-009-1 R1.	

Mitigation Plan Submitted On: February 05, 2019

Mitigation Plan Accepted On:

Mitigation Plan Proposed Completion Date: June 28, 2019

Actual Completion Date of Mitigation Plan:

Mitigation Plan Certified Complete by AEP On:

Mitigation Plan Completion Verified by RF On:

Mitigation Plan Completed? (Yes/No): No

## Compliance Notices

Section 6.2 of the NERC CMEP sets forth the information that must be included in a Mitigation Plan. The Mitigation Plan must include:

- (1) The Registered Entity's point of contact for the Mitigation Plan, who shall be a person (i) responsible for filing the Mitigation Plan, (ii) technically knowledgeable regarding the Mitigation Plan, and (iii) authorized and competent to respond to questions regarding the status of the Mitigation Plan. This person may be the Registered Entity's point of contact described in Section B.
  - (2) The Alleged or Confirmed Violation(s) of Reliability Standard(s) the Mitigation Plan will correct.
  - (3) The cause of the Alleged or Confirmed Violation(s).
  - (4) The Registered Entity's action plan to correct the Alleged or Confirmed Violation(s).
  - (5) The Registered Entity's action plan to prevent recurrence of the Alleged or Confirmed violation(s).
  - (6) The anticipated impact of the Mitigation Plan on the bulk power system reliability and an action plan to mitigate any increased risk to the reliability of the bulk power-system while the Mitigation Plan is being implemented.
  - (7) A timetable for completion of the Mitigation Plan including the completion date by which the Mitigation Plan will be fully implemented and the Alleged or Confirmed Violation(s) corrected.
  - (8) Implementation milestones no more than three (3) months apart for Mitigation Plans with expected completion dates more than three (3) months from the date of submission. Additional violations could be determined or recommended to the applicable governmental authorities for not completing work associated with accepted milestones.
  - (9) Any other information deemed necessary or appropriate.
  - (10) The Mitigation Plan shall be signed by an officer, employee, attorney or other authorized representative of the Registered Entity, which if applicable, shall be the person that signed the Self Certification or Self Reporting submittals.
  - (11) This submittal form may be used to provide a required Mitigation Plan for review and approval by regional entity(ies) and NERC.
- The Mitigation Plan shall be submitted to the regional entity(ies) and NERC as confidential information in accordance with Section 1500 of the NERC Rules of Procedure.
  - This Mitigation Plan form may be used to address one or more related alleged or confirmed violations of one Reliability Standard. A separate mitigation plan is required to address alleged or confirmed violations with respect to each additional Reliability Standard, as applicable.
  - If the Mitigation Plan is accepted by regional entity(ies) and approved by NERC, a copy of this Mitigation Plan will be provided to the Federal Energy Regulatory Commission or filed with the applicable governmental authorities for approval in Canada.
  - Regional Entity(ies) or NERC may reject Mitigation Plans that they determine to be incomplete or inadequate.
  - Remedial action directives also may be issued as necessary to ensure reliability of the bulk power system.
  - The user has read and accepts the conditions set forth in these Compliance Notices.

Entity Information

Identify your organization:

Entity Name: American Electric Power Service Corporation [ Legal name see comment below]

NERC Compliance Registry ID: NCR00682

Address: 1 Riverside Plaza  
Columbus OH 43215

Identify the individual in your organization who will serve as the Contact to the Regional Entity regarding this Mitigation Plan. This person shall be technically knowledgeable regarding this Mitigation Plan and authorized to respond to Regional Entity regarding this Mitigation Plan:

Name: Darrel A Grumman

Title: Sr. NERC Compliance Specialist

Email: dgrumman@aep.com

Phone: 614-716-2362

Violation(s)

This Mitigation Plan is associated with the following violation(s) of the reliability standard listed below:

Violation ID	Date of Violation	Requirement
Requirement Description		
RFC2018020207	06/18/2007	FAC-009-1 R1.
The Transmission Owner and Generator Owner shall each establish Facility Ratings for its solely and jointly owned Facilities that are consistent with the associated Facility Ratings Methodology.		

Brief summary including the cause of the violation(s) and mechanism in which it was identified:

The Facility Ratings violation at the Arsenal Hill - Lieberman 138 kV Facility has been determined to be the result of the original one-line drawing of Lieberman station incorrectly specifying 1200 amp switches, instead of the 600 amp switches found by field verification. The 600 amp switches, which became the most limiting series element, reduced the ratings as displayed below:

	SN	SE	WN	WE
Old Rating (MVA)	188	188	234	234
New Rating (MVA)	156	173	188	202

During the violation period, there was a lack of sufficient internal control to ensure drawings and the facility ratings database match current field conditions.

Relevant information regarding the identification of the violation(s):

On 5/11/2018, AEP discovered that the Facility Rating on the Arsenal Hill - Lieberman 138 kV Facility was erroneous due to an incorrect amp value that was placed on a 138-kV line switch in the Facility Ratings database. AEP decided to proactively validate all of its Facility Ratings in MRO after discovering a Facility Ratings issue in another Region (Violation ID: TRE2017016853), which is how the issue was identified. The Facility Ratings database indicated that the 138-kV line switches at Lieberman station were 1200 amp switches on this 138-kV circuit; However, after field verification at Lieberman station, it was discovered that the 138-kV line switches were actually 600 amps, which then made it the most limiting series element on the line.

Plan Details

Identify and describe the action plan, including specific tasks and actions that your organization is proposing to undertake, or which it undertook if this Mitigation Plan has been completed, to correct the violation(s) identified above in Section C.1 of this form:

Milestone 1: Correct the facility rating on Arsenal Hill-Lieberman 138 kV.

Milestone 2: Develop and implement a quarterly detective control.

Milestone 3: Complete Facility Ratings data validation for all of the applicable Facilities in the region.

Milestone 4: Determine root causes for the derates found and use these as input for facility ratings improvements in Milestone 6.

Milestone 5: Update internal records and make notifications to applicable personnel with results of validation process.

Milestone 6: A comprehensive review of AEP Transmission's facility ratings process and methodology will be performed.

Provide the timetable for completion of the Mitigation Plan, including the completion date by which the Mitigation Plan will be fully implemented and the violations associated with this Mitigation Plan are corrected:

Proposed Completion date of Mitigation Plan: June 28, 2019

Milestone Activities, with completion dates, that your organization is proposing for this Mitigation Plan:

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
1 - Initial Fix	Ratings at the Arsenal Hill-Lieberman 138kV facility were updated on May 18, 2018 to reflect the 600A switches, the most limiting series element. This resulted in a ratings decrease as shown in the chart in the Cause section. Additionally, applicable AEP and SPP personnel were notified of the reduced rating on May 18, 2018.	07/01/2018	05/18/2018		No

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
2 - Detective Control	Develop and implement a quarterly detective internal control that samples field data to verify field conditions match one-line diagrams, inventory lists, and/or other applicable source documents. By the end of each quarter, a review of a random sample of in-service facilities from the previous quarter will be performed. Implementation of this control will begin in 2019 after the extent of condition ratings review has been performed, as to not duplicate efforts.	10/01/2018	10/01/2018		No
3 - Ratings Data Validation	Complete Facility Ratings data validation for all of the applicable Facilities in the SPP region as part of extent of condition review.	12/31/2018	12/31/2018		No
4 - Root Cause Determination	Determine root causes for the derates found and use these as input for facility ratings improvements in Milestone 6.	01/31/2019			No
5 - Update and notify	Based on the results of the validation process, update	03/29/2019			No

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
	internal records, as appropriate, and make notifications to applicable internal and external personnel (SPP).				
6 - Facility Ratings Process Improvements	A comprehensive review of AEP Transmission's facility ratings process and methodology will be performed in an effort to identify gaps and prevent recurrences of facility ratings issues. The review will include, but is not limited to, defining explicit steps to verify all equipment ratings against inventory and one-line diagrams for all planned equipment projects, and an updated process to verify that Facility Ratings are correctly determined before placing the Facility in service.	06/28/2019			No

Additional Relevant Information

## Reliability Risk

### Reliability Risk

While the Mitigation Plan is being implemented, the reliability of the bulk Power System may remain at higher Risk or be otherwise negatively impacted until the plan is successfully completed. To the extent they are known or anticipated : (i) Identify any such risks or impacts, and; (ii) discuss any actions planned or proposed to address these risks or impacts.

The violation posed a minimal risk and did not pose a serious or substantial risk to the reliability of the bulk power system (BPS). While an incorrect Facility Rating could result in errors in the planning and operational models and possible equipment damage or reduced equipment lifetimes, the line loading data at Arsenal Hill - Lieberman showed the equipment remained at or below 120 MVA during the violation period, thus operating well under the corrected rating of 156 MVA Summer normal.

### Prevention

Describe how successful completion of this plan will prevent or minimize the probability further violations of the same or similar reliability standards requirements will occur

In addition to the review of the data in the facility ratings database, AEP is developing a detective control to review the facility ratings on a quarterly basis. AEP is revising the steps to verify the equipment and Facility Ratings for all planned projects. Existing processes to verify Facility Ratings calculations prior to placing facilities in service are also being reviewed and updated.

Beyond the completion date of this mitigation plan, AEP is reviewing its policies, procedures, work flows, and guidelines around Facility Ratings. Based on the outcome of that review appropriate controls related to notification to impacted parties are expected whenever there are Facility Rating changes initiated by any of the groups responsible for maintaining these ratings. AEP is also in the planning stages of deploying T-Nexus (Software Tool from Siemens-PTI) to support Facility Rating databases across systems. As these activities will be ongoing after this mitigation plan has ended, AEP will keep RF/MRO informed of progress over time.

Describe any action that may be taken or planned beyond that listed in the mitigation plan, to prevent or minimize the probability of incurring further violations of the same or similar standards requirements

Authorization

An authorized individual must sign and date the signature page. By doing so, this individual, on behalf of your organization:

- \* Submits the Mitigation Plan, as presented, to the regional entity for acceptance and approval by NERC, and
- \* if applicable, certifies that the Mitigation Plan, as presented, was completed as specified.

Acknowledges:

1. I am qualified to sign this mitigation plan on behalf of my organization.
2. I have read and understand the obligations to comply with the mitigation plan requirements and ERO remedial action directives as well as ERO documents, including but not limited to, the NERC rules of procedure and the application NERC CMEP.
3. I have read and am familiar with the contents of the foregoing Mitigation Plan.

American Electric Power Service Corporation [ Legal name see comment below] Agrees to be bound by, Plan, including the timetable completion date, as accepted by the Regional Entity, NERC, and if required, the applicable governmental authority.

Authorized Individual Signature: \_\_\_\_\_  
(Electronic signature was received by the Regional Office via CDMS. For Electronic Signature Policy see CMEP.)

Authorized Individual

Name: Bob Bradish

Title: VP AEP Transmission Planning & Engineering

Authorized On: February 01, 2019

### Mitigation Plan

#### Mitigation Plan Summary

Registered Entity: American Electric Power Service Corporation [ Legal name see comment below]

Mitigation Plan Code: RFCMIT015143

Mitigation Plan Version: 1

NERC Violation ID	Requirement	Violation Validated On
RFC2019021786	FAC-008-3 R6.	

Mitigation Plan Submitted On: June 16, 2020

Mitigation Plan Accepted On:

Mitigation Plan Proposed Completion Date: May 31, 2019

Actual Completion Date of Mitigation Plan:

Mitigation Plan Certified Complete by AEP On:

Mitigation Plan Completion Verified by RF On:

Mitigation Plan Completed? (Yes/No): No

## Compliance Notices

Section 6.2 of the NERC CMEP sets forth the information that must be included in a Mitigation Plan. The Mitigation Plan must include:

- (1) The Registered Entity's point of contact for the Mitigation Plan, who shall be a person (i) responsible for filing the Mitigation Plan, (ii) technically knowledgeable regarding the Mitigation Plan, and (iii) authorized and competent to respond to questions regarding the status of the Mitigation Plan. This person may be the Registered Entity's point of contact described in Section B.
  - (2) The Alleged or Confirmed Violation(s) of Reliability Standard(s) the Mitigation Plan will correct.
  - (3) The cause of the Alleged or Confirmed Violation(s).
  - (4) The Registered Entity's action plan to correct the Alleged or Confirmed Violation(s).
  - (5) The Registered Entity's action plan to prevent recurrence of the Alleged or Confirmed violation(s).
  - (6) The anticipated impact of the Mitigation Plan on the bulk power system reliability and an action plan to mitigate any increased risk to the reliability of the bulk power-system while the Mitigation Plan is being implemented.
  - (7) A timetable for completion of the Mitigation Plan including the completion date by which the Mitigation Plan will be fully implemented and the Alleged or Confirmed Violation(s) corrected.
  - (8) Implementation milestones no more than three (3) months apart for Mitigation Plans with expected completion dates more than three (3) months from the date of submission. Additional violations could be determined or recommended to the applicable governmental authorities for not completing work associated with accepted milestones.
  - (9) Any other information deemed necessary or appropriate.
  - (10) The Mitigation Plan shall be signed by an officer, employee, attorney or other authorized representative of the Registered Entity, which if applicable, shall be the person that signed the Self Certification or Self Reporting submittals.
  - (11) This submittal form may be used to provide a required Mitigation Plan for review and approval by regional entity(ies) and NERC.
- The Mitigation Plan shall be submitted to the regional entity(ies) and NERC as confidential information in accordance with Section 1500 of the NERC Rules of Procedure.
  - This Mitigation Plan form may be used to address one or more related alleged or confirmed violations of one Reliability Standard. A separate mitigation plan is required to address alleged or confirmed violations with respect to each additional Reliability Standard, as applicable.
  - If the Mitigation Plan is accepted by regional entity(ies) and approved by NERC, a copy of this Mitigation Plan will be provided to the Federal Energy Regulatory Commission or filed with the applicable governmental authorities for approval in Canada.
  - Regional Entity(ies) or NERC may reject Mitigation Plans that they determine to be incomplete or inadequate.
  - Remedial action directives also may be issued as necessary to ensure reliability of the bulk power system.
  - The user has read and accepts the conditions set forth in these Compliance Notices.

Entity Information

Identify your organization:

Entity Name: American Electric Power Service Corporation [ Legal name see comment below]

NERC Compliance Registry ID: NCR00682

Address: 1 Riverside Plaza  
Columbus OH 43215

Identify the individual in your organization who will serve as the Contact to the Regional Entity regarding this Mitigation Plan. This person shall be technically knowledgeable regarding this Mitigation Plan and authorized to respond to Regional Entity regarding this Mitigation Plan:

Name: Stephen Globeck

Title: Enterprise NERC Compliance Specialist Principal

Email: sjglobeck@aep.com

Phone: 614-716-2374

Violation(s)

This Mitigation Plan is associated with the following violation(s) of the reliability standard listed below:

Violation ID	Date of Violation	Requirement
Requirement Description		
RFC2019021786	05/18/2018	FAC-008-3 R6.
Each Transmission Owner and Generator Owner shall have Facility Ratings for its solely and jointly owned Facilities that are consistent with the associated Facility Ratings methodology or documentation for determining its Facility Ratings.		

Brief summary including the cause of the violation(s) and mechanism in which it was identified:

On October 19th, 2018, during a combined station review session, an AEP employee discovered that the Saltville - Tazewell 138 kV Circuit and the Tazewell - Trail Fork 138 kV Circuit were inadvertently left un-six-wired for the first span on both circuits near Tazewell Station. Once the incorrect design was discovered, it was realized that the circuits were operating with the incorrect facility ratings documented. For the Saltville - Tazewell 138 kV Circuit, the circuit operated with the incorrect ratings from May 18, 2018 until October 22, 2018. For the Tazewell - Trail Fork 138 kV Circuit, the circuit operated with the incorrect ratings from August 2, 2018 until October 22, 2018.

Both circuits were energized with the incorrect facility ratings. The final construction of both circuits did not match the initial design. The initial design was used to develop the facility ratings so they were incorrect and the change was not identified by AEP until after the circuits had been energized and in use. The root cause of the incident is that AEP failed to verify that the facility ratings of the circuits (prior to energization) matched the initial design facility ratings. This resulted in AEP using the incorrect ratings from the initial design for the two circuits upon energization.

Relevant information regarding the identification of the violation(s):

On October 19th, 2018, during a station review session, an AEP employee discovered that the Saltville - Tazewell 138 kV Circuit and the Tazewell - Trail Fork 138 kV Circuit were inadvertently left un-six-wired for the first span on both circuits near Tazewell Station. This resulted in lines, as-built, not matching the initial design. The facility ratings in used for the Saltville - Tazewell and Tazewell - Trail Fork 138 kV circuits were based on the initial design of the circuits, resulting in AEP using incorrect facility ratings for these two circuits.

Plan Details

Identify and describe the action plan, including specific tasks and actions that your organization is proposing to undertake, or which it undertook if this Mitigation Plan has been completed, to correct the violation(s) identified above in Section C.1 of this form:

In order to mitigate the incorrect ratings for the Saltville - Tazewell 138 kV circuit and the Tazewell - Trail Fork 138 kV circuit AEP performed the following actions:

1. Issued a temporary derate on the Saltville - Tazewell and Tazewell - Trail Fork 138 kV circuits
2. Removed the Saltville - Tazewell and Tazewell - Trail Fork 138 kV circuits from service and installed the correct circuit ties
3. Removed the derate and restored the correct Saltville - Tazewell and Tazewell - Trail Fork circuit ratings to the as designed ratings
4. Placed the Saltville - Tazewell and Tazewell - Trail Fork circuits back into service
5. Updated the AEP Transmission facility ratings process to incorporate changes that address the root cause of multiple AEP FAC-008 issues
6. Implemented a quarterly sampling process as part of a detective control

The incorrect ratings for the Saltville - Tazewell 138 kV circuit and the Tazewell - Trail Fork 138 kV circuit were discovered as part of a planned substation review. An extent of conditions was not needed because the station was undergoing a planned review and any additional extent of condition activities would be duplicative of the initial efforts in which the issue was discovered on October 19, 2018.

Provide the timetable for completion of the Mitigation Plan, including the completion date by which the Mitigation Plan will be fully implemented and the violations associated with this Mitigation Plan are corrected:

Proposed Completion date of Mitigation Plan: May 31, 2019

Milestone Activities, with completion dates, that your organization is proposing for this Mitigation Plan:

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
1.0 - Issued derate on both circuits	AEP Transmission Operations issued a temporary derate on both circuits (Saltville - Tazewell and Tazewell - Trail Fork) on 10/22/2018. The ratings (initial and temporary derate) are shown below.  Saltville - Tazewell 138 kV Circuit 1. Summer Normal (SN) - 296 MVA to 151 MVA 2. Summer Emergency (SE) - 296 MVA to 151	10/22/2018	10/22/2018		No

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
	<p>MVA</p> <p>3.Winter Normal (WN) - 375 MVA to 199 MVA</p> <p>4.Winter Emergency (WE) - 375 MVA to 199 MVA</p> <p>Tazewell - Trail Fork 138 kV Circuit</p> <p>1.Summer Normal (SN) - 293 MVA to 167 MVA</p> <p>2.Summer Emergency (SE) - 334 MVA to 167 MVA</p> <p>3.Winter Normal (WN) - 370 MVA to 211 MVA</p> <p>4.Winter Emergency (WE) - 406 MVA to 211 MVA</p>				
2.0 - Completed installation of circuit ties on both circuits	<p>AEP completed the installation of circuit ties to the Saltville - Tazewell and Tazewell - Trail Fork circuits. The initial design of both circuits was not installed correctly. Both circuits were left un-six-wired. AEP installed the correct circuit ties to correct the issue and complete the initial installation work. The initial ratings for these circuits were based on the initial design so the work completed on 11/14/2018 allowed AEP to restore the ratings of the circuits</p>	11/14/2018	11/14/2018		No

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
	to their initially designed ratings.				
3.0 - Removed derate and restored ratings to both circuits	<p>Upon installation of the correct circuit ties for the Saltville - Tazewell and Tazewell - Trail Fork circuits, AEP Transmission reviewed the construction and verified that it now matched the original design. AEP Transmission was able to removed the temporary derates on both circuits and restore them to their initially designed ratings. The restoration of the ratings (temporary derate to designed ratings) is shown below.</p> <p>Saltville - Tazewell 138 kV Circuit 1.Summer Normal (SN) - 151 MVA to 296 MVA 2.Summer Emergency (SE) - 151 MVA to 296 MVA 3.Winter Normal (WN) - 199 MVA to 375 MVA 4.Winter Emergency (WE) - 199 MVA to 375 MVA</p> <p>Tazewell - Trail Fork 138 kV Circuit 1.Summer Normal (SN) - 167 MVA to</p>	11/14/2018	11/14/2018		No

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
	293 MVA 2. Summer Emergency (SE) - 167 MVA to 334 MVA 3. Winter Normal (WN) - 211 MVA to 370 MVA 4. Winter Emergency (WE) - 211 MVA to 406 MVA				
4.0 - Revised the AEP Transmission Facility Ratings process	AEP developed and implemented a revised Facility Ratings methodology that included explicit steps to verify all equipment ratings against inventory and one-line diagrams for all planned equipment projects.	02/01/2019	02/01/2019		No
5.0 - Conduct a comprehensive review of AEP Transmission's facility ratings process	AEP conducted a comprehensive review of AEP Transmission's facility rating process and methodology. The purpose of this review was to incorporate changes that address the root causes of this violation and previous AEP violations (specifically TRE2017016853 and TRE2018020835). The review was an effort to identify gaps and prevent recurrence of these facility ratings violations. The review led to an	05/01/2019	05/01/2019		No

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
	updated process that included defining explicit steps to verify all equipment ratings against inventory and one-line diagrams for all planned equipment projects. The review also led to the enhancement of an existing process to verify that Facility Ratings are correctly determined before energizing and placing each Facility in service.				
6.0 - Develop and implement quarterly sampling internal control	AEP developed and implemented a quarterly detective internal control that samples field data to verify field conditions match one-line diagrams, inventory lists, and/or other applicable source documents. This control will review a random sample of in-service facilities at the end of each quarter. These samples will incorporate Facilities that were place in service in the previous quarter.	05/31/2019	05/31/2019		No

Additional Relevant Information  
 [RFC] AEP: MP-402, PCI-2308

## Reliability Risk

### Reliability Risk

While the Mitigation Plan is being implemented, the reliability of the bulk Power System may remain at higher Risk or be otherwise negatively impacted until the plan is successfully completed. To the extent they are known or anticipated : (i) Identify any such risks or impacts, and; (ii) discuss any actions planned or proposed to address these risks or impacts.

#### For the Saltville - Tazewell Circuit:

The violation posed a minimal risk and did not pose a serious or substantial risk to the reliability of the bulk power system (BPS). While an incorrect Facility Rating could result in errors in the planning and operational models and possible equipment damage or reduced equipment lifetimes, the line loading data showed the equipment remained at or below 122.5 MVA, except for a momentary spike on September 2, 2018 when it operated at approximately 156.7 MVA and was estimated to last 56 seconds. This was due to a momentary lightning fault on the Baileysville - Trail Fork 138 kV Circuit. This was the only occurrence the circuit operated above the corrected rating of 151 MVA Summer normal.

#### For the Tazewell - Trail Fork line:

The violation posed a minimal risk and did not pose a serious or substantial risk to the reliability of the bulk power system (BPS). While an incorrect Facility Rating could result in errors in the planning and operational models and possible equipment damage or reduced equipment lifetimes, the line loading data showed the equipment remained at or below 90.5 MVA, except for a momentary spike on September 2, 2018 when it operated at approximately 156.7 MVA and was estimated to last 56 seconds. This was due to a momentary lightning fault on the Baileysville - Trail Fork 138 kV Circuit. The circuit never operated above the corrected rating of 167 MVA Summer normal.

### Prevention

Describe how successful completion of this plan will prevent or minimize the probability further violations of the same or similar reliability standards requirements will occur

This issue was identified on October 19, 2018 and fully mitigated on November 14, 2018. Since then, AEP Transmission revised the Facility Rating procedure to include reviews of all equipment ratings and verify the facility ratings against one-line diagrams for all planned equipment projects. The Facility Ratings process also includes steps to verify that Facility Ratings are correctly determined before placing equipment in service.

Describe any action that may be taken or planned beyond that listed in the mitigation plan, to prevent or minimize the probability of incurring further violations of the same or similar standards requirements

Authorization

An authorized individual must sign and date the signature page. By doing so, this individual, on behalf of your organization:

- \* Submits the Mitigation Plan, as presented, to the regional entity for acceptance and approval by NERC, and
- \* if applicable, certifies that the Mitigation Plan, as presented, was completed as specified.

Acknowledges:

1. I am qualified to sign this mitigation plan on behalf of my organization.
2. I have read and understand the obligations to comply with the mitigation plan requirements and ERO remedial action directives as well as ERO documents, including but not limited to, the NERC rules of procedure and the application NERC CMEP.
3. I have read and am familiar with the contents of the foregoing Mitigation Plan.

American Electric Power Service Corporation [ Legal name see comment below] Agrees to be bound by, Plan, including the timetable completion date, as accepted by the Regional Entity, NERC, and if required, the applicable governmental authority.

Authorized Individual Signature: \_\_\_\_\_

(Electronic signature was received by the Regional Office via CDMS. For Electronic Signature Policy see CMEP.)

Authorized Individual

Name: Robert W Bradish

Title: VP Trans Planning & Engrg

Authorized On: June 12, 2020

### Certification of Mitigation Plan Completion

Submittal of a Certification of Mitigation Plan Completion shall include data or information sufficient for the Regional Entity to verify completion of the Mitigation Plan. The Regional Entity may request additional data or information and conduct follow-up assessments, on-site or other Spot Checking, or Compliance Audits as it deems necessary to verify that all required actions in the Mitigation Plan have been completed and the Registered Entity is in compliance with the subject Reliability Standard. (CMEP Section 6.6)

Registered Entity Name: American Electric Power Service Corporation [ Legal name see comment below]

NERC Registry ID: NCR00682

NERC Violation ID(s): RFC2018020207

Mitigated Standard Requirement(s): FAC-009-1 R1.

Scheduled Completion as per Accepted Mitigation Plan: June 28, 2019

Date Mitigation Plan completed: June 28, 2019

RF Notified of Completion on Date: July 02, 2019

Entity Comment:

Additional Documents			
From	Document Name	Description	Size in Bytes
Entity	MP-355_Signed.pdf		5,652,345

I certify that the Mitigation Plan for the above named violation(s) has been completed on the date shown above and that all submitted information is complete and correct to the best of my knowledge.

Name: Bob Bradish

Title: VP AEP Transmission Planning & Engineering

Email: rwbradish@aep.com

Phone: 1 (614) 933-2300

Authorized Signature \_\_\_\_\_ Date \_\_\_\_\_

(Electronic signature was received by the Regional Office via CDMS. For Electronic Signature Policy see CMEP.)

### Certification of Mitigation Plan Completion

Submittal of a Certification of Mitigation Plan Completion shall include data or information sufficient for the Regional Entity to verify completion of the Mitigation Plan. The Regional Entity may request additional data or information and conduct follow-up assessments, on-site or other Spot Checking, or Compliance Audits as it deems necessary to verify that all required actions in the Mitigation Plan have been completed and the Registered Entity is in compliance with the subject Reliability Standard. (CMEP Section 6.6)

Registered Entity Name: American Electric Power Service Corporation [ Legal name see comment below]

NERC Registry ID: NCR00682

NERC Violation ID(s): RFC2019021786

Mitigated Standard Requirement(s): FAC-008-3 R6.

Scheduled Completion as per Accepted Mitigation Plan: May 31, 2019

Date Mitigation Plan completed: May 31, 2019

RF Notified of Completion on Date: August 11, 2020

Entity Comment:

Additional Documents			
From	Document Name	Description	Size in Bytes
Entity	MP-402 Certification Package.pdf	AEP Certification Package	1,502,272

I certify that the Mitigation Plan for the above named violation(s) has been completed on the date shown above and that all submitted information is complete and correct to the best of my knowledge.

Name: Robert W Bradish

Title: VP Transmission Planning & Engineering

Email: rwbradish@aep.com

Phone: 1 (614) 933-2300

Authorized Signature \_\_\_\_\_ Date \_\_\_\_\_

(Electronic signature was received by the Regional Office via CDMS. For Electronic Signature Policy see CMEP.)



## Mitigation Plan Verification for RFC2018020207

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American Electric Power Service Corporation (“AEP”)

**Standard/Requirement:** FAC-009-1 R1

**NERC Mitigation Plan ID:** RFCMIT014369

**Method of Disposition:** Not yet determined

Relevant Dates					
Initiating Document	Mitigation Plan Submittal	RF Acceptance	NERC Approval	Certification Submittal	Date of Completion
Self-Report 08/02/18 Consolidated PNC 08/02/18	02/05/19	02/06/19	03/05/19	07/02/19	05/01/19

### Description of Issue

[MITIGATION TASK RFC2018020207](#)

Evidence Reviewed		
File Name	Description of Evidence	Standard/Req.
File 1	1 MP-355_Signed RFC2018020207	FAC-009-1 R1

### Verification of Mitigation Plan Completion

**Milestone 1:** Update the Arsenal Hill – Lieberman 138 kV Facility Ratings to reflect the most limiting series element.

Proposed Completion Date: July 01, 2018

Actual Completion Date: May 18, 2018



“EVIDENCE FILE 1 MP-355\_Signed RFC2018020207.pdf,” includes the following evidence:

- Arsenal Hill – Lieberman Before 0 AEPW\_KREMLIN\_BRANCH\_RATINGS\_IMPEDANCES\_2018 05 11.pdf, PDF Page 6, indicates Summer Normal/Emergency ratings of 188 MVA and Winter Normal/Emergency ratings of 234 MVA.
- DERATE – Arsenal Hill – Liberman – After – AEPW\_KREMLIN\_BRANCH\_RATINGS\_IMPEDANCES\_2018 05 18.pdf, PDF Page 7, indicates revised Summer Normal rating of 156 MVA, Summer Emergency of 173 MVA, Winter Normal of 188 MVA, and Winter Emergency of 202 MVA.
- FW\_SWEPSCO Ratings Only Update 05\_18\_2018.pdf, PDF Page 8, includes the external email between AEP and SPP regarding the new ratings for the Arsenal Hill – Lieberman 138 kV line.

The above evidence demonstrates completion of this milestone.

Milestone #1 Completion verified.

***Milestone 2:*** Develop and Implement a Quarterly Detective Internal Control.

Proposed Completion Date: October 01, 2018

Actual Completion Date: October 01, 2018

“EVIDENCE FILE 1 MP-355\_Signed RFC2018020207.pdf,” includes the following evidence:

- Milestone 2 – Detective Control.pdf: PDF Pages 10 and 11, consist of the AEP Transmission Detective Control for FAC-008 R6 dated October 1, 2018, Version 2 which demonstrates completion of this milestone.

Milestone #2 Completion verified.

***Milestone 3:*** Complete Facility Ratings Data Validation.

Proposed Completion Date: December 31, 2018

Actual Completion Date: January 28, 2019



“EVIDENCE FILE 1 MP-355\_Signed RFC2018020207.pdf,” includes the following evidence:

- SPP facilities\_derates 1\_28\_19.pdf, PDF Pages 12 and 13, consist of a table of branch derates.
- SPP increases.pdf, PDF Pages 14 and 15, consist of a table of branch rating changes highlighted in blue.

The above evidence demonstrates completion of this milestone.

Milestone #3 Completion verified.

**Milestone 4:** Determine root causes for the derates found and use these as input for facility ratings improvements in Milestone 6.

Proposed Completion Date: January 31, 2019

Actual Completion Date: January 28, 2019

“EVIDENCE FILE 1 MP-355\_Signed RFC2018020207.pdf,” includes the following evidence:

- Reference “SPP facilities\_derates 1\_28\_19.pdf, PDF Pages 12 and 13, consist of a table of branch derates.

Milestone #4 Completion verified.

**Milestone 5:** Update internal records and make notifications to applicable internal and external personnel.

Proposed Completion Date: March 29, 2019

Actual Completion Date: April 1, 2019

“EVIDENCE FILE 1 MP-355\_Signed RFC2018020207.pdf,” includes the following evidence:

- spp\_milestone5.pdf, PDF include the following rating changes:
- PDF Pages 16 through 18, Hope Switching – AECC Fulton Plant
- PDF Pages 19 through 21, Arsenal Hill – Lieberman



- PDF Pages 22 and 23, Bann – NW Texarkana T
- PDF Pages 24 through 26, Center – Tenaha
- PDF Pages 27 through 29, Okay – Turk
- PDF Pages 30 through 32, Flint Creek – Tonnece (GRDA)
- PDF Pages 33 and 34, Trichel St – Trichel St T
- PDF Pages 35 through 37, Hyland – SE Fayetteville
- PDF Pages 38 and 39, Lydia (SWEPCO) – Valliant (PSO)
- PDF Pages 40 through 42, Oak Hill #1 – NW Henderson
- PDF Pages 43 through 45, Chambers Spring – Clarksville 345
- PDF Pages 46 through 48, Eastex Switching Station – Harrison Road
- PDF Pages 49 and 50, Mattison Plant – Tontitown
- PDF Pages 51 and 52, East Centerton – Greenhouse Rd
- PDF Pages 53 and 54, Bentonville PDO #5 – Gentry
- PDF Pages 55 and 56, Gentry – Flint Creek
- PDF Pages 57 and 58, Arsenal Hill – Stall Power Station
- PDF Pages 59 and 60, Carthage POD – New Prospect (Rusk)
- PDF Pages 61 and 62, Wilburton Enogex – Sardis
- PDF Pages 63 and 64, Sardis – Clayton
- PDF Pages 65 through 67, Flint Creek – Shipe Road
- PDF Pages 68 and 69, East Centerton – Centerton
- PDF Pages 70 through 72, Flint Creek East 345/161 kV Autotransformer
- PDF Pages 73 and 74, Flint Creek West 345/161 kV Autotransformer
- PDF Pages 75 and 76, Tontitown 345/161 kV South Auto
- PDF Pages 77 through 79, Northwest Texarkana 345/138/ kV North Auto
- PDF Pages 80 through 82, Northwest Texarkana 345/138 kV South Autotransformer
- PDF Pages 83 through 85, Wilkes 345/138 kV Auto
- PDF Pages 86 and 87, Layfield 500/230 kV Autotransformer
- PDF Pages 88 and 89, Pirkey South 345 Auto
- PDF Pages 90 and 91, Pirkey North Auto
- PDF Pages 92 through 94, Russell (WFEC) – Lake Pauline
- PDF Pages 95 through 97, Comanche – Lawton ES
- PDF Pages 98 through 100, TPS – 36<sup>th</sup> & Lewis
- PDF Pages 101 and 102, RSS – Glenpool Explorer
- PDF Pages 103 and 104, Pine & Peoria Tap – Wekiwa
- PDF Pages 105 through 107, American Airlines – Mingo Road Airport
- PDF Pages 108 and 109, CDC West Tap – Tulsa North
- PDF Pages 110 through 112, Cornville – Blanchard Tap (Str 117)
- PDF Pages 113 through 115, B’Ville Comanche – Bartlesville SE
- PDF Pages 116 through 118, Riverside Power Station – ORU South Tap (81-513B)
- PDF Pages 119 through 121, Warren Medical Center East Tap (81-809D) – South Hudson



- PDF Pages 122 and 123, McAlester City – Dustin Tap
- PDF Pages 124 through 126, Elsworth Station – Southwestern Station
- PDF Pages 127 and 128, Tuttle Tap – Tuttle Conoco Tap
- PDF Pages 129 and 130, CDC East Tap – Tulsa North
- PDF Pages 131 through 133, Lone Oak – McAlester City
- PDF Pages 134 and 135, Elgin Jct Tap (81-825) – Elgin Jct
- PDF Pages 136 through 138, Skiatook Water Pump – Tulsa North 138
- PDF Pages 139 through 141, Oneta – 121<sup>st</sup> & Lynn Lane Tap
- PDF Pages 142 through 145, Cowskin – Grove (PSO)
- PDF Pages 146 and 147, Grove 161/138 kV Auto
- PDF Pages 148 and 149, KPP 345 – Pittsburg 345
- PDF Pages 149 through 151, Owasso 86<sup>th</sup> Street North Tap – Tulsa North
- PDF Pages 152 through 155, Riverside Station 345 – Sapulpa Road
- PDF Pages 156 through 158, Riverside 138 – Riverside 345 #2
- PDF Pages 159 through 161, Riverside 138 – Riverside 345 #1
- PDF Pages 162 through 164, 72<sup>nd</sup> & Elwood – Tulsa Power Station
- PDF Pages 165 and 166, Eliza Creek – Mound Road
- PDF Pages 167 and 168, Red Oak 138/69 kV Auto
- PDF Pages 169 through 173, Altus Jct – Snyder 138
- PDF Pages 174 and 175, Sapulpa Road Auto #1
- PDF Pages 176 and 177, Delaware 345 345/138 kV Auto #1
- PDF Pages 178 through 180, Lawton Eastside 345/138 kV Autotransformer #5
- PDF Pages 181 through 183, Valliant 345/138 kV Auto #1
- PDF Pages 184 through 186, Oneta 345/138 kV Autotransformer #1
- PDF Pages 187 and 188, Oneta 345/138 kV Autotransformer #2
- PDF Page 189, Lone Oak (AEP) – Carbon
- EXTERNAL RD Derate Concerns.pdf, PDF Pages 190 through 192, consists of the external email string between AEP and SPP in April 2019, related to derate concerns.
- RE FAC-008- SPP ratings and impedance update.pdf, PDF Page 193, consists of the internal email string in April 2019, related to the SPP ratings and impedance update.
- Facility Ratings Database Rate Decreases.pdf, PDF Page 194, consists of the internal email dated March 18, 2019, related to the Facility Ratings Database Decreases.

The above evidence demonstrates completion of this milestone.

Milestone # 5 Completion verified.



**Milestone 6:** Facility ratings Process Improvements.

Proposed Completion Date: June 28, 2019

Actual Completion Date: May 1, 2019

“EVIDENCE FILE 1 MP-355\_Signed RFC2018020207.pdf,” includes the following evidence:

- SE\_MLSE\_Process\_v0.docx, PDF Pages 195 through 231, consists of the AEP Transmission MLSE Process For Station Assets, Effective Date May 1, 2019.
- FAC-008 Process Map\_TRE Submittal.pdf, PDF Pages 232 through 237, consists of the AEP Transmission Facility Rating Process, Effective Date April 30, 2019.
- TP-000003-Transmission Facility Ratings – Rev 1.8-2019-02-12.docx.pdf, PDF Pages 238 through 246, consists of the AEP Transmission Procedure for Determining Transmission Facility Ratings, Version 1.8, released February 12, 2019.

The above evidence demonstrates completion of this milestone.

Milestone #6 Completion verified.

The Mitigation Plan is hereby verified complete.

A handwritten signature in black ink, appearing to read 'Anthony Jablonski', written over a horizontal line.

Date: August 6, 2019

Anthony Jablonski  
Manager, Risk Analysis & Mitigation  
ReliabilityFirst Corporation



## Mitigation Plan Verification for RFC2019021786

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American Electric Power Service Corporation (“AEP”)

**Standard/Requirement:** FAC-008-3 R6

**NERC Mitigation Plan ID:** RFCMIT015143

**Date of Completion of Mitigation:** May 30, 2019

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**Description of Issue:** [Case File](#)

Evidence Reviewed	
File Name	Description of Evidence
File 1	MP-402 Certification Package

### Verification of Mitigation Plan Completion

**Milestone 1:** Issue derate on both circuits.

Proposed Completion Date: 10/22/2018

Actual Completion Date: 10/22/2018

File 1 MP-402 Certification Package.pdf, PDF Pages 9 & 10 consist of the internal email dated October 22, 2018 which includes the temporary derates of the Saltville – Tazewell and Tazewell - Trail Fork 138 kV circuits. This demonstrates completion of this milestone.

Milestone #1: Completion verified.

**Milestone 2:** Complete installation of circuit ties on both circuits.

Proposed Completion Date: 11/14/2018



Actual Completion Date: 11/14/2018

File 1 MP-402 Certification Package.pdf, PDF Page 9 consists of the internal email dated November 14, 2018 which explains that the circuit tie was installed at Tazewell Station on the Saltville – Tazewell 138 kV circuit and Tazewell – Trail Fork 138 kV circuit. This demonstrates completion of this milestone.

Milestone #2: Completion verified.

***Milestone 3:*** Remove derate and restore ratings to both circuits.

Proposed Completion Date: 11/14/2018

Actual Completion Date: 11/14/2018

File 1 MP-402 Certification Package.pdf, PDF Page 9 consists of the internal email dated November 14, 2018 which explains that the temporary derates of the Saltville – Tazewell and Tazewell - Trail Fork 138 kV circuits has been corrected since the circuit tie was installed. This demonstrates completion of this milestone.

Milestone #3: Completion verified.

***Milestone 4:*** Revise the AEP Transmission Facility Ratings process.

Proposed Completion Date: 02/01/2019

Actual Completion Date: 02/12/2019

File 1 MP-402 Certification Package.pdf, PDF Pages 11 through 19 consists of the AEP Transmission Procedure for Determining Transmission Facility Ratings, Version 1.8 dated February 12, 2019. This version was updated to address issuing a multiplier exception list due to operational concerns. This demonstrates completion of this milestone.

Milestone #4: Completion verified.

***Milestone 5:*** Conduct a comprehensive review of AEP Transmission facility rating process.



Proposed Completion Date: 05/01/2019

Actual Completion Date: 04/30/2019

File 1 MP-402 Certification Package.pdf, PDF Pages 20 through 25 consists of the AEP Transmission Facility Rating Process document effective 04/30/2019. The document includes flowcharts for Facility Rating Process Rating Checks and Planned Work-Facility rating Process.

Milestone #5: Completion verified.

**Milestone 6:** Develop and implement quarterly sampling internal control.

Proposed Completion Date: 05/31/2019

Actual Completion Date: 05/30/2019

File 1 MP-402 Certification Package.pdf, PDF Pages 26 & 27 consists of the AEP Transmission Detective Control for FAC-008 R6 dated May 30, 2019, Version 2. The Purpose of the control is to verify that the ratings for Facilities that have recently been placed in-service are accurate within the Facility Ratings database (Kremlin). This demonstrates completion of this milestone.

Milestone #6: Completion verified.

The Mitigation Plan is hereby verified complete.

A handwritten signature in black ink, appearing to read 'Anthony Jablonski'.

Date: August 25, 2020

Anthony Jablonski  
Manager, Risk Analysis & Mitigation  
ReliabilityFirst Corporation

## Self Report

Entity Name: American Electric Power Service Corporation [ Legal name see comment below] (AEP)

NERC ID: NCR00682

Standard: PRC-023-2

Requirement: PRC-023-2 R1.

Date Submitted: December 21, 2017

Has this violation previously No  
been reported or discovered?:

Entity Information:

Joint Registration  
Organization (JRO) ID:

Coordinated Functional  
Registration (CFR) ID:

Contact Name: Nicholas Morton

Contact Phone: 6147162342

Contact Email: namorton@aep.com

Violation:

Violation Start Date: April 19, 2013

End/Expected End Date: February 21, 2017

Reliability Functions: Transmission Owner (TO)

Is Possible Violation still No  
occurring?:

Number of Instances: 1

Has this Possible Violation Yes  
been reported to other  
Regions?:

Which Regions: SPPRE

Date Reported to Regions: December 19, 2017

Detailed Description and Cause of Possible Violation: This self-report addresses five instances impacting compliance for PRC-023-3, R1 where the transmission line relay trip limit was not set at or above 150% of the highest seasonal Facility Rating of a circuit per Criteria 1.

Incident No. 1 - On October 20th, 2016 it was discovered that New relay settings were issued for a new transmission line Facility. The relay loadability evaluation was not done in accordance with Criteria 1 and settings were applied and placed in service with the Relay Trip Limit being the MLSE of the transmission line. This incident occurred from April 19, 2013 to January 12, 2017.

Incident No. 2 - On January 24th, 2017 it was discovered that circuit breaker upgrades led to a change in Winter Emergency ratings for a transmission Line Facility. This created a change in the MLSE and required a revised Relay Trip Limit on four devices (two relays at either end of the transmission Line Facility). The Relay Trip Limit was not updated to ensure that they operated at 150% of the revised highest seasonal Facility Rating per Criteria 1. The incident occurred from June 2, 2015 to February 21, 2017.

Incident No. 3 - On February 6th, 2017 it was discovered that circuit breaker upgrades led to a change in Winter Emergency ratings for a transmission Line Facility. This created a change in the MLSE and required a revised Relay Trip Limit on two devices (two relays at one end of the transmission Line Facility). The Relay Trip Limit was not updated to ensure that they operated at 150% of

## Self Report

the revised highest seasonal Facility Rating per Criteria 1. The incident occurred from July 7, 2015 to February 17, 2017.

Incident No. 4 - On June 24th, 2017 it was discovered that a backup protection relay was left in-service on one end of a transmission line with settings that did not reflect the recently updated highest seasonal Facility Rating. Both ends of the line had the backup relays with old settings but only one was connected. After the discovery, the impacted protection relay was disconnected as the Relay Trip Limit did not meet the requirements of Criteria 1 of the Standard and the relay no longer needed. This incident occurred from July 2, 2017 to August 4, 2017.

Incident No. 5 - On November 2nd, 2017 it was discovered that following the replacement of a relay on a line protection scheme, the incorrect settings were applied to the replacement relay. The relay settings did not reflect the recently updated highest seasonal Facility rating. A loadability evaluation was not done in accordance with Criteria 1 and settings remained in service with the incorrect Relay Trip Limit. This incident occurred from May, 2nd 2017 to December 5, 2017.

### Mitigating Activities:

Description of Mitigating Activities and Preventative Measure: Incident No. 1 - Settings were issued and updated on January 12th, 2017 in accordance with the new Winter Emergency ratings.

Incident No. 2 - Settings were issued and updated on February 21st, 2017 in accordance with the new Winter Emergency ratings.

Incident No. 3 - Settings were issued and updated on February 17th, 2017 in accordance with the new Winter Emergency ratings.

Incident No. 4 - Wiring drawings were modified and sent to the field to disconnect the Zone 4 protection relay. Work was completed on August 4th, 2017.

Incident No. 5 - Settings were issued and updated on December 5th, 2017 in accordance with the new Winter Emergency ratings.

Date Mitigating Activities Completed: February 21, 2017

### Impact and Risk Assessment:

Potential Impact to BPS: Minimal

Actual Impact to BPS: Minimal

Description of Potential and Actual Impact to BPS: The violation posed a minimal risk and did not pose a serious or substantial risk to the Bulk Power System. At no time, during any of the incidents described above, was the line loading more than 55% of the highest seasonal Facility Rating and at no time did the line loading exceed 74% of the established relay trip limit.

Risk Assessment of Impact to BPS: The violation posed a minimal risk and did not pose a serious or substantial risk to the Bulk Power System. At no time, during any of the incidents described above, was the line loading more than 55% of the highest seasonal Facility Rating and at no time did the line loading exceed 74% of the established relay trip limit.

Additional Entity Comments: Note that this self-report impacts the SPP region and was submitted to SPPRE on 12/19/2017. SPPRE requested that the self-report be submitted to RF region due to MRRE.

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Self Report

Additional Comments		
From	Comment	User Name
No Comments		

Additional Documents			
From	Document Name	Description	Size in Bytes
No Documents			

## Self Report

Entity Name: American Electric Power Service Corporation [ Legal name see comment below] (AEP)

NERC ID: NCR00682

Standard: PRC-023-3

Requirement: PRC-023-3 R1.

Date Submitted: August 02, 2018

Has this violation previously No  
been reported or discovered?:

Entity Information:

Joint Registration  
Organization (JRO) ID:

Coordinated Functional  
Registration (CFR) ID:

Contact Name: Darrel Grumman

Contact Phone: 6147162362

Contact Email: dgrumman@aep.com

Violation:

Violation Start Date: January 07, 2016

End/Expected End Date: May 25, 2018

Reliability Functions: Transmission Owner (TO)

Is Possible Violation still No  
occurring?:

Number of Instances: 1

Has this Possible Violation No  
been reported to other  
Regions?:

Which Regions:

Date Reported to Regions:

Detailed Description and Cause of Possible Violation: On 5/15/2018, while performing a result of the extent of condition review for a Facility Ratings issue, AEP discovered that the applied relay settings on the Dumont-Sorenson 345kV Facility at Dumont did not have the required loadability margin. The margin was set at 109% instead of what is required by Criteria one. This incident had been occurring since 1/7/2016 and was mitigated on 5/25/2018.

At this time, the cause of this incident has been determined to be human error by the contractor who calculated and submitted the relay settings for the Dumont-Sorenson 345kV Facility and the check of work was less than adequate by the contractor who performed the setting calculations.

Mitigating Activities:

Description of Mitigating Activities and Preventative Measure: Updated settings were applied on 5/25/2018. AEP is looking into requiring contractors to perform a preventative control to check their calculations prior to submission.

Self Report

Date Mitigating Activities May 25, 2018  
Completed:

**Impact and Risk Assessment:**

Potential Impact to BPS: Minimal

Actual Impact to BPS: Minimal

Description of Potential and Actual Impact to BPS: The violation posed a minimal risk and did not pose a serious or substantial risk to the Bulk Power System. At no time, during any of the incidents described above, was the line loading more than 66% of the highest seasonal Facility Rating and at no time did the line loading exceed 61% of the established relay trip limit.

Risk Assessment of Impact to BPS: The violation posed a minimal risk and did not pose a serious or substantial risk to the Bulk Power System. At no time, during any of the incidents described above, was the line loading more than 66% of the highest seasonal Facility Rating and at no time did the line loading exceed 61% of the established relay trip limit.

Additional Entity Comments: Due to the time period, this violation also impacts PRC-23-4 version, however due to Web CDMS portal restrictions, it could only be reported under one standard and PRC-23-3 was chosen.

Since the impact to the BES was minimal, AEP requests that ReliabilityFirst review and process this instance as a FFT or Compliance Exception.

Additional Comments		
From	Comment	User Name
No Comments		

Additional Documents			
From	Document Name	Description	Size in Bytes
No Documents			

## Self Report

Entity Name: American Electric Power Service Corporation [ Legal name see comment below] (AEP)

NERC ID: NCR00682

Standard: PRC-023-4

Requirement: PRC-023-4 R1.

Date Submitted: August 02, 2018

Has this violation previously No  
been reported or discovered?:

Entity Information:

Joint Registration  
Organization (JRO) ID:

Coordinated Functional  
Registration (CFR) ID:

Contact Name: Darrel Grumman

Contact Phone: 6147162362

Contact Email: dgrumman@aep.com

Violation:

Violation Start Date: June 06, 2017

End/Expected End Date: March 08, 2018

Reliability Functions: Transmission Owner (TO)

Is Possible Violation still No  
occurring?:

Number of Instances: 1

Has this Possible Violation Yes  
been reported to other  
Regions?:

Which Regions: MRO

Date Reported to Regions: August 02, 2018

Detailed Description and Breakers were added at North Proctorville Station splitting the existing line Cause of Possible Violation: (Amos-Hanging Rock) into two Facilities -- Amos-N Proctorville 765kV and Hanging Rock-N Proctorville. On 3/5/2018, while performing an extent of condition review for a Facility Ratings issue, AEP discovered that the relay settings for both facilities did not have the required loadability margin. The margin was set at Amos-N Proctorville 765kV at 111% instead what was required by Criteria one. This incident had been occurring since 9/20/2017 and was mitigated on 3/9/2018. During the investigation, the Hanging Rock-N Proctorville Facility was also reviewed and it was determined, that while currently compliant with PRC-023, there was a time of non-compliance during the project, 1/25/2017 - 5/8/2017. The margin had been set at 121% instead of the 150% as required by Criteria one.

The cause of this incident has been determined to be the failure to follow the established process, which requires the communication of changes to Facilities so that relay settings are validated for adherence to the Standard.

Mitigating Activities:

Description of Mitigating Updated settings for the Amos-N Proctorville 765kV Facility -- applied on Activities and Preventative 3/8/2018. Updated settings for Hanging Rock-N Proctorville Facility had the Measure: settings applied on 6/1/17 and the Facility was placed in-service on 6/6/17. As

Self Report

a preventative control a notification will be created to notify the appropriate personnel when a ratings change has been proposed.

Date Mitigating Activities March 08, 2018 Completed:

Impact and Risk Assessment:

Potential Impact to BPS: Minimal Actual Impact to BPS: Minimal

Description of Potential and Actual Impact to BPS: The violation posed a minimal risk and did not pose a serious or substantial risk to the Bulk Power System. At no time, during any of the incidents described above, was the line loading more than 19% of the highest seasonal Facility Rating and at no time did the line loading exceed 17% of the relay trip limits that were in effect at the time.

Risk Assessment of Impact to BPS: The violation posed a minimal risk and did not pose a serious or substantial risk to the Bulk Power System. At no time, during any of the incidents described above, was the line loading more than 19% of the highest seasonal Facility Rating and at no time did the line loading exceed 17% of the relay trip limits that were in effect at the time.

Additional Entity Comments: Since the impact to the BES was minimal, AEP requests that ReliabilityFirst review and process this instance as a Compliance Exception or FFT.

Table with 3 columns: From, Comment, User Name. Row 1: No Comments

Table with 4 columns: From, Document Name, Description, Size in Bytes. Row 1: No Documents

### Mitigation Plan

#### Mitigation Plan Summary

Registered Entity: American Electric Power Service Corporation [ Legal name see comment below]

Mitigation Plan Code:

Mitigation Plan Version: 1

NERC Violation ID	Requirement	Violation Validated On
RFC2018018935	PRC-023-2 R1.	

Mitigation Plan Submitted On: October 25, 2018

Mitigation Plan Accepted On:

Mitigation Plan Proposed Completion Date: November 13, 2018

Actual Completion Date of Mitigation Plan:

Mitigation Plan Certified Complete by AEP On:

Mitigation Plan Completion Verified by RF On:

Mitigation Plan Completed? (Yes/No): No

## Compliance Notices

Section 6.2 of the NERC CMEP sets forth the information that must be included in a Mitigation Plan. The Mitigation Plan must include:

- (1) The Registered Entity's point of contact for the Mitigation Plan, who shall be a person (i) responsible for filing the Mitigation Plan, (ii) technically knowledgeable regarding the Mitigation Plan, and (iii) authorized and competent to respond to questions regarding the status of the Mitigation Plan. This person may be the Registered Entity's point of contact described in Section B.
  - (2) The Alleged or Confirmed Violation(s) of Reliability Standard(s) the Mitigation Plan will correct.
  - (3) The cause of the Alleged or Confirmed Violation(s).
  - (4) The Registered Entity's action plan to correct the Alleged or Confirmed Violation(s).
  - (5) The Registered Entity's action plan to prevent recurrence of the Alleged or Confirmed violation(s).
  - (6) The anticipated impact of the Mitigation Plan on the bulk power system reliability and an action plan to mitigate any increased risk to the reliability of the bulk power-system while the Mitigation Plan is being implemented.
  - (7) A timetable for completion of the Mitigation Plan including the completion date by which the Mitigation Plan will be fully implemented and the Alleged or Confirmed Violation(s) corrected.
  - (8) Implementation milestones no more than three (3) months apart for Mitigation Plans with expected completion dates more than three (3) months from the date of submission. Additional violations could be determined or recommended to the applicable governmental authorities for not completing work associated with accepted milestones.
  - (9) Any other information deemed necessary or appropriate.
  - (10) The Mitigation Plan shall be signed by an officer, employee, attorney or other authorized representative of the Registered Entity, which if applicable, shall be the person that signed the Self Certification or Self Reporting submittals.
  - (11) This submittal form may be used to provide a required Mitigation Plan for review and approval by regional entity(ies) and NERC.
- The Mitigation Plan shall be submitted to the regional entity(ies) and NERC as confidential information in accordance with Section 1500 of the NERC Rules of Procedure.
  - This Mitigation Plan form may be used to address one or more related alleged or confirmed violations of one Reliability Standard. A separate mitigation plan is required to address alleged or confirmed violations with respect to each additional Reliability Standard, as applicable.
  - If the Mitigation Plan is accepted by regional entity(ies) and approved by NERC, a copy of this Mitigation Plan will be provided to the Federal Energy Regulatory Commission or filed with the applicable governmental authorities for approval in Canada.
  - Regional Entity(ies) or NERC may reject Mitigation Plans that they determine to be incomplete or inadequate.
  - Remedial action directives also may be issued as necessary to ensure reliability of the bulk power system.
  - The user has read and accepts the conditions set forth in these Compliance Notices.

Entity Information

Identify your organization:

Entity Name: American Electric Power Service Corporation [ Legal name see comment below]

NERC Compliance Registry ID: NCR00682

Address: 1 Riverside Plaza  
Columbus OH 43215

Identify the individual in your organization who will serve as the Contact to the Regional Entity regarding this Mitigation Plan. This person shall be technically knowledgeable regarding this Mitigation Plan and authorized to respond to Regional Entity regarding this Mitigation Plan:

Name: Darrel A Grumman  
Title: Sr NERC Compliance Spec.  
Email: dgrumman@aep.com  
Phone: 614-716-2362

Violation(s)

This Mitigation Plan is associated with the following violation(s) of the reliability standard listed below:

Violation ID	Date of Violation	Requirement
Requirement Description		
RFC2018018935	04/19/2013	PRC-023-2 R1.
<p>Each Transmission Owner, Generator Owner, and Distribution Provider shall use any one of the following criteria (Requirement R1, criteria 1 through 13) for any specific circuit terminal to prevent its phase protective relay settings from limiting transmission system loadability while maintaining reliable protection of the BES for all fault conditions. Each Transmission Owner, Generator Owner, and Distribution Provider shall evaluate relay loadability at 0.85 per unit voltage and a power factor angle of 30 degrees.</p> <ol style="list-style-type: none"> <li>1. Set transmission line relays so they do not operate at or below 150% of the highest seasonal Facility Rating of a circuit, for the available defined loading duration nearest 4 hours (expressed in amperes).</li> <li>2. Set transmission line relays so they do not operate at or below 115% of the highest seasonal 15-minute Facility Rating of a circuit (expressed in amperes).</li> <li>3. Set transmission line relays so they do not operate at or below 115% of the maximum theoretical power transfer capability (using a 90-degree angle between the sending-end and receiving-end voltages and either reactance or complex impedance) of the circuit (expressed in amperes) using one of the following to perform the power transfer calculation:                         <ul style="list-style-type: none"> <li>• An infinite source (zero source impedance) with a 1.00 per unit bus voltage at each end of the line.</li> <li>• An impedance at each end of the line, which reflects the actual system source impedance with a 1.05 per unit voltage behind each source impedance.</li> </ul> </li> <li>4. Set transmission line relays on series compensated transmission lines so they do not operate at or below the maximum power transfer capability of the line, determined as the greater of:                         <ul style="list-style-type: none"> <li>• 115% of the highest emergency rating of the series capacitor.</li> <li>• 115% of the maximum power transfer capability of the circuit (expressed in amperes), calculated in accordance with Requirement R1, criterion 3, using the full line inductive reactance.</li> </ul> </li> <li>5. Set transmission line relays on weak source systems so they do not operate at or below 170% of the maximum end-of-line three-phase fault magnitude (expressed in amperes).</li> <li>6. Set transmission line relays applied on transmission lines connected to generation stations remote to load so they do not operate at or below 230% of the aggregated generation nameplate capability.</li> <li>7. Set transmission line relays applied at the load center terminal, remote from generation stations, so they do not operate at or below 115% of the maximum current flow from the load to the generation source under any system configuration.</li> <li>8. Set transmission line relays applied on the bulk system-end of transmission lines that serve load remote to the system so they do not operate at or below 115% of the maximum current flow from the system to the load under any system configuration.</li> <li>9. Set transmission line relays applied on the load-end of transmission lines that serve load remote to the bulk system so they do not operate at or below 115% of the maximum current flow from the load to the system under any system configuration.</li> <li>10. Set transformer fault protection relays and transmission line relays on transmission lines terminated only with a transformer so that the relays do not operate at or below the greater of:                         <ul style="list-style-type: none"> <li>• 150% of the applicable maximum transformer nameplate rating (expressed in amperes), including the forced cooled ratings corresponding to all installed supplemental cooling equipment.</li> <li>• 115% of the highest operator established emergency transformer rating</li> </ul> </li> <li>10.1 Set load responsive transformer fault protection relays, if used, such that the protection settings do not expose the transformer to a fault level and duration that exceeds the transformer's mechanical withstand capability .</li> <li>11. For transformer overload protection relays that do not comply with the loadability component of Requirement R1, criterion 10 set the relays according to one of the following:                         <ul style="list-style-type: none"> <li>• Set the relays to allow the transformer to be operated at an overload level of at least 150% of the maximum</li> </ul> </li> </ol>		

Violation ID	Date of Violation	Requirement
Requirement Description		
RFC2018018935	04/19/2013	PRC-023-2 R1.
<p>applicable nameplate rating, or 115% of the highest operator established emergency transformer rating, whichever is greater, for at least 15 minutes to provide time for the operator to take controlled action to relieve the overload.</p> <ul style="list-style-type: none"> <li>• Install supervision for the relays using either a top oil or simulated winding hot spot temperature element set no less than 100° C for the top oil temperature or no less than 140° C for the winding hot spot temperature .</li> </ul> <p>12. When the desired transmission line capability is limited by the requirement to adequately protect the transmission line, set the transmission line distance relays to a maximum of 125% of the apparent impedance (at the impedance angle of the transmission line) subject to the following constraints:</p> <ol style="list-style-type: none"> <li>a. Set the maximum torque angle (MTA) to 90 degrees or the highest supported by the manufacturer.</li> <li>b. Evaluate the relay loadability in amperes at the relay trip point at 0.85 per unit voltage and a power factor angle of 30 degrees.</li> <li>c. Include a relay setting component of 87% of the current calculated in Requirement R1, criterion 12 in the Facility Rating determination for the circuit.</li> </ol> <p>13. Where other situations present practical limitations on circuit capability, set the phase protection relays so they do not operate at or below 115% of such limitations.</p>		

Brief summary including the cause of the violation(s) and mechanism in which it was identified:

This mitigation plan addresses instances at five Facilities, totaling 11 devices, impacting compliance for PRC-023, R1 where the transmission line relay trip limit was not set at or above 150% of the highest seasonal Facility Rating of a circuit per Criteria 1.

For all 5 incidents, the root cause was the lack of an internal control to prevent ratings changes without the review and approval of personnel responsible for determining the line relay trip limit and compliance of PRC-023, R1.

Relevant information regarding the identification of the violation(s):

Five instances impacting compliance for PRC-023, R1 were identified where the transmission line relay trip limit was not set at or above 150% of the highest seasonal Facility Rating of a circuit per Criteria 1. Further detail is outlined below:

Incident No. 1 - On October 20th, 2016 it was discovered during an internal Peer Review that new relay settings were issued for a new transmission line Facility. The relay loadability evaluation was not done in accordance with Criteria 1 and settings were applied and placed in service with the Relay Trip Limit being the MLSE of the transmission line. This incident occurred from April 19, 2013 to January 12, 2017.

Incident No. 2 - On January 24th, 2017 it was discovered during an internal Peer Review that circuit breaker upgrades led to a change in Winter Emergency ratings for a transmission Line Facility. This created a change in the MLSE and required a revised Relay Trip Limit on four devices (two relays at either end of the transmission Line Facility). The Relay Trip Limit was not updated to ensure that they operated at 150% of the revised highest seasonal Facility Rating per Criteria 1. The incident occurred from June 2, 2015 to February 21, 2017.

Incident No. 3 - On February 6th, 2017 it was discovered during an internal Peer Review that circuit breaker upgrades led to a change in Winter Emergency ratings for a transmission Line Facility. This created a change in the MLSE and required a revised Relay Trip Limit on two devices (two relays at one end of the transmission Line Facility). The Relay Trip Limit was not updated to ensure that they operated at 150% of the revised highest seasonal Facility Rating per Criteria 1. The incident occurred from July 7, 2015 to February 17, 2017.

Incident No. 4 - On June 28th, 2017 it was discovered during an internal Peer Review that a backup protection relay was left in-service on one end of a transmission line with settings that did not reflect the recently updated highest seasonal Facility Rating. Both ends of the line had the backup relays with old settings but only one was connected. After the discovery, the impacted protection relay was

disconnected as the Relay Trip Limit did not meet the requirements of Criteria 1 of the Standard and the relay no longer needed. This incident occurred from July 2, 2015 to August 4, 2017.

Incident No. 5 - On November 2nd, 2017 it was discovered during an internal Peer Review that following the replacement of a relay on a line protection scheme, the incorrect settings were applied to the replacement relay. The relay settings did not reflect the recently updated highest seasonal Facility rating. A loadability evaluation was not done in accordance with Criteria 1 and settings remained in service with the incorrect Relay Trip Limit. This incident occurred from May, 2nd 2017 to December 5, 2017.

Plan Details

Identify and describe the action plan, including specific tasks and actions that your organization is proposing to undertake, or which it undertook if this Mitigation Plan has been completed, to correct the violation(s) identified above in Section C.1 of this form:

Corrected the reported issues (Milestone 1)

Review facility ratings database to determine if there are any PRC-023 R1 compliance concerns based on current data and, if so, take steps to remediate. (Milestone 2)

Develop control/process that requires review/approval of Protection and Control Engineering (PCE) to allow for ratings changes for PRC-023 applicable Facilities. When the element data submitted to Transmission Planning results in a Facility Rating change, planning will obtain the sign-off from PCE, prior to implementing the change. (Milestone 3)

Provide the timetable for completion of the Mitigation Plan, including the completion date by which the Mitigation Plan will be fully implemented and the violations associated with this Mitigation Plan are corrected:

Proposed Completion date of Mitigation Plan: November 13, 2018

Milestone Activities, with completion dates, that your organization is proposing for this Mitigation Plan:

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
Corrected the five reported incidents of non-adherence to PCR-023 R1	For four of the reported PRC-023 incidents, revised relay settings were applied to bring the Facilities into compliance with PRC-023 R1. For the fourth incident, the impacted protection relay was disconnected as the Relay Trip Limit did not meet the requirements of Criteria 1 of the	02/15/2018	12/05/2017		No

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
	Standard and was no longer needed.				
Reviewed the facilities rating database to determine if there are any PRC-023 R1 compliance concerns based on current data.	Reviewed the facilities rating database within the SPP RE to determine if there were any PRC-023 R1 compliance concerns based on current data. For PRC-023 applicable Facilities, reviewed the Relay Setting and Winter Emergency rating to determine if the loadability requirement was being met.	05/16/2018	04/25/2018		No
Develop control/process to prevent ratings changes without review/approval	Develop a control/process to prevent ratings changes without the review/approval of personnel responsible for determining the line relay trip limit. When the element data results in a Facility Rating change, sign-off will be obtained prior to implementing the change.  Whenever a Winter Emergency (WE) ratings change is being processed in the facility ratings database on a PRC-023 applicable facility, the database will not allow WE	08/13/2018	08/09/2018		No

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
	ratings change on such facilities unless certain fields are filled out indicating that a review was performed by the appropriate group approving/denying the ratings change. Information contained in the database for the applicable facilities will lead the user to a ShareNow site, which will contain review evidence.				
Implement control/process to prevent ratings changes without the proper review/approval	Implement control/process that requires review/approval to allow for ratings changes for PRC-023 applicable Facilities. When an element will result in a Facility Rating change, sign-off will be obtained prior to implementing the change.	11/13/2018			No

Additional Relevant Information

## Reliability Risk

### Reliability Risk

While the Mitigation Plan is being implemented, the reliability of the bulk Power System may remain at higher Risk or be otherwise negatively impacted until the plan is successfully completed. To the extent they are known or anticipated : (i) Identify any such risks or impacts, and; (ii) discuss any actions planned or proposed to address these risks or impacts.

The violation posed a minimal risk and did not pose a serious or substantial risk to the Bulk Power System. At no time, during any of the incidents described above, was the line loading more than 55% of the highest seasonal Facility Rating and at no time did the line loading exceed 74% of the established relay trip limit.

### Prevention

Describe how successful completion of this plan will prevent or minimize the probability further violations of the same or similar reliability standards requirements will occur

Develop and implement control/process to prevent ratings changes across all AEP regions without the review/approval of personnel responsible for determining the line relay trip limit. When the element data results in a Facility Rating change, sign-off will be obtained prior to implementing the change. Whenever Transmission Planning is processing a Winter Emergency (WE) ratings change in the facility ratings database (Kremlin) on a PRC-023 applicable facility, Kremlin will not allow WE ratings change on such facilities unless certain fields are filled out indicating that a review was performed by P&C approving/denying the ratings change. Information contained in Kremlin for the applicable facilities will lead the user to the P&C ShareNow site, which will contain review evidence.

Describe any action that may be taken or planned beyond that listed in the mitigation plan, to prevent or minimize the probability of incurring further violations of the same or similar standards requirements

Authorization

An authorized individual must sign and date the signature page. By doing so, this individual, on behalf of your organization:

- \* Submits the Mitigation Plan, as presented, to the regional entity for acceptance and approval by NERC, and
- \* if applicable, certifies that the Mitigation Plan, as presented, was completed as specified.

Acknowledges:

1. I am qualified to sign this mitigation plan on behalf of my organization.
2. I have read and understand the obligations to comply with the mitigation plan requirements and ERO remedial action directives as well as ERO documents, including but not limited to, the NERC rules of procedure and the application NERC CMEP.
3. I have read and am familiar with the contents of the foregoing Mitigation Plan.

American Electric Power Service Corporation [ Legal name see comment below] Agrees to be bound by, Plan, including the timetable completion date, as accepted by the Regional Entity, NERC, and if required, the applicable governmental authority.

Authorized Individual Signature: \_\_\_\_\_

(Electronic signature was received by the Regional Office via CDMS. For Electronic Signature Policy see CMEP.)

Authorized Individual

Name: Dwayne Stadford

Title: Managing Director Transmission Reliability Assurance

Authorized On: October 25, 2018

### Mitigation Plan

#### Mitigation Plan Summary

Registered Entity: American Electric Power Service Corporation [ Legal name see comment below]

Mitigation Plan Code:

Mitigation Plan Version: 1

NERC Violation ID	Requirement	Violation Validated On
RFC2018020205	PRC-023-4 R1.	

Mitigation Plan Submitted On: February 07, 2019

Mitigation Plan Accepted On:

Mitigation Plan Proposed Completion Date: February 28, 2019

Actual Completion Date of Mitigation Plan:

Mitigation Plan Certified Complete by AEP On:

Mitigation Plan Completion Verified by RF On:

Mitigation Plan Completed? (Yes/No): No

## Compliance Notices

Section 6.2 of the NERC CMEP sets forth the information that must be included in a Mitigation Plan. The Mitigation Plan must include:

- (1) The Registered Entity's point of contact for the Mitigation Plan, who shall be a person (i) responsible for filing the Mitigation Plan, (ii) technically knowledgeable regarding the Mitigation Plan, and (iii) authorized and competent to respond to questions regarding the status of the Mitigation Plan. This person may be the Registered Entity's point of contact described in Section B.
  - (2) The Alleged or Confirmed Violation(s) of Reliability Standard(s) the Mitigation Plan will correct.
  - (3) The cause of the Alleged or Confirmed Violation(s).
  - (4) The Registered Entity's action plan to correct the Alleged or Confirmed Violation(s).
  - (5) The Registered Entity's action plan to prevent recurrence of the Alleged or Confirmed violation(s).
  - (6) The anticipated impact of the Mitigation Plan on the bulk power system reliability and an action plan to mitigate any increased risk to the reliability of the bulk power-system while the Mitigation Plan is being implemented.
  - (7) A timetable for completion of the Mitigation Plan including the completion date by which the Mitigation Plan will be fully implemented and the Alleged or Confirmed Violation(s) corrected.
  - (8) Implementation milestones no more than three (3) months apart for Mitigation Plans with expected completion dates more than three (3) months from the date of submission. Additional violations could be determined or recommended to the applicable governmental authorities for not completing work associated with accepted milestones.
  - (9) Any other information deemed necessary or appropriate.
  - (10) The Mitigation Plan shall be signed by an officer, employee, attorney or other authorized representative of the Registered Entity, which if applicable, shall be the person that signed the Self Certification or Self Reporting submittals.
  - (11) This submittal form may be used to provide a required Mitigation Plan for review and approval by regional entity(ies) and NERC.
- The Mitigation Plan shall be submitted to the regional entity(ies) and NERC as confidential information in accordance with Section 1500 of the NERC Rules of Procedure.
  - This Mitigation Plan form may be used to address one or more related alleged or confirmed violations of one Reliability Standard. A separate mitigation plan is required to address alleged or confirmed violations with respect to each additional Reliability Standard, as applicable.
  - If the Mitigation Plan is accepted by regional entity(ies) and approved by NERC, a copy of this Mitigation Plan will be provided to the Federal Energy Regulatory Commission or filed with the applicable governmental authorities for approval in Canada.
  - Regional Entity(ies) or NERC may reject Mitigation Plans that they determine to be incomplete or inadequate.
  - Remedial action directives also may be issued as necessary to ensure reliability of the bulk power system.
  - The user has read and accepts the conditions set forth in these Compliance Notices.

Entity Information

Identify your organization:

Entity Name: American Electric Power Service Corporation [ Legal name see comment below]

NERC Compliance Registry ID: NCR00682

Address: 1 Riverside Plaza  
Columbus OH 43215

Identify the individual in your organization who will serve as the Contact to the Regional Entity regarding this Mitigation Plan. This person shall be technically knowledgeable regarding this Mitigation Plan and authorized to respond to Regional Entity regarding this Mitigation Plan:

Name: Darrel A Grumman  
Title: Sr NERC Compliance Specialist  
Email: dgrumman@aep.com  
Phone: 614-716-2362

Violation(s)

This Mitigation Plan is associated with the following violation(s) of the reliability standard listed below:

Violation ID	Date of Violation	Requirement
Requirement Description		
RFC2018020205	06/06/2017	PRC-023-4 R1.
<p>Each Transmission Owner, Generator Owner, and Distribution Provider shall use any one of the following criteria (Requirement R1, criteria 1 through 13) for any specific circuit terminal to prevent its phase protective relay settings from limiting transmission system loadability while maintaining reliable protection of the BES for all fault conditions. Each Transmission Owner, Generator Owner, and Distribution Provider shall evaluate relay loadability at 0.85 per unit voltage and a power factor angle of 30 degrees.</p> <p>Criteria:</p> <ol style="list-style-type: none"> <li>1. Set transmission line relays so they do not operate at or below 150% of the highest seasonal Facility Rating of a circuit, for the available defined loading duration nearest 4 hours (expressed in amperes).</li> <li>2. Set transmission line relays so they do not operate at or below 115% of the highest seasonal 15-minute Facility Rating of a circuit (expressed in amperes).</li> <li>3. Set transmission line relays so they do not operate at or below 115% of the maximum theoretical power transfer capability (using a 90-degree angle between the sending-end and receiving-end voltages and either reactance or complex impedance) of the circuit (expressed in amperes) using one of the following to perform the power transfer calculation: <ul style="list-style-type: none"> <li>• An infinite source (zero source impedance) with a 1.00 per unit bus voltage at each end of the line.</li> <li>• An impedance at each end of the line, which reflects the actual system source impedance with a 1.05 per unit voltage behind each source impedance.</li> </ul> </li> <li>4. Set transmission line relays on series compensated transmission lines so they do not operate at or below the maximum power transfer capability of the line, determined as the greater of: <ul style="list-style-type: none"> <li>• 115% of the highest emergency rating of the series capacitor.</li> <li>• 115% of the maximum power transfer capability of the circuit (expressed in amperes), calculated in accordance with Requirement R1, criterion 3, using the full line inductive reactance.</li> </ul> </li> <li>5. Set transmission line relays on weak source systems so they do not operate at or below 170% of the maximum end-of-line three-phase fault magnitude (expressed in amperes).</li> <li>6. Not used.</li> <li>7. Set transmission line relays applied at the load center terminal, remote from generation stations, so they do not operate at or below 115% of the maximum current flow from the load to the generation source under any system configuration.</li> <li>8. Set transmission line relays applied on the bulk system-end of transmission lines that serve load remote to the system so they do not operate at or below 115% of the maximum current flow from the system to the load under any system configuration.</li> <li>9. Set transmission line relays applied on the load-end of transmission lines that serve load remote to the bulk system so they do not operate at or below 115% of the maximum current flow from the load to the system under any system configuration.</li> <li>10. Set transformer fault protection relays and transmission line relays on transmission lines terminated only with a transformer so that the relays do not operate at or below the greater of: <ul style="list-style-type: none"> <li>• 150% of the applicable maximum transformer nameplate rating (expressed in amperes), including the forced cooled ratings corresponding to all installed supplemental cooling equipment.</li> <li>• 115% of the highest operator established emergency transformer rating.</li> </ul> </li> <li>10.1 Set load-responsive transformer fault protection relays, if used, such that the protection settings do not expose the transformer to a fault level and duration that exceeds the transformer's mechanical withstand capability .</li> <li>11. For transformer overload protection relays that do not comply with the loadability component of Requirement R1, criterion 10 set the relays according to one of the following: <ul style="list-style-type: none"> <li>• Set the relays to allow the transformer to be operated at an overload level of at least 150% of the maximum applicable nameplate rating, or 115% of the highest operator established emergency transformer rating, whichever is</li> </ul> </li> </ol>		

Violation ID	Date of Violation	Requirement
Requirement Description		
RFC2018020205	06/06/2017	PRC-023-4 R1.
<p>greater, for at least 15 minutes to provide time for the operator to take controlled action to relieve the overload.</p> <ul style="list-style-type: none"> <li>• Install supervision for the relays using either a top oil or simulated winding hot spot temperature element set no less than 100° C for the top oil temperature or no less than 140° C for the winding hot spot temperature .</li> </ul> <p>12. When the desired transmission line capability is limited by the requirement to adequately protect the transmission line, set the transmission line distance relays to a maximum of 125% of the apparent impedance (at the impedance angle of the transmission line) subject to the following constraints:</p> <ol style="list-style-type: none"> <li>a. Set the maximum torque angle (MTA) to 90 degrees or the highest supported by the manufacturer.</li> <li>b. Evaluate the relay loadability in amperes at the relay trip point at 0.85 per unit voltage and a power factor angle of 30 degrees.</li> <li>c. Include a relay setting component of 87% of the current calculated in Requirement R1, criterion 12 in the Facility Rating determination for the circuit.</li> </ol> <p>13. Where other situations present practical limitations on circuit capability, set the phase protection relays so they do not operate at or below 115% of such limitations.</p>		

Brief summary including the cause of the violation(s) and mechanism in which it was identified:

This mitigation plan addresses instances at three facilities, impacting compliance for PRC-023, R1 where the transmission relay trip limit was not set at or above 150% of the highest seasonal Facility Rating of a circuit per Criteria 1.

There are two causes among these three incidents.

Incident 1: At Dumont 345kV station, the applied relay settings on the Dumont-Sorenson 345kV Facility did not have the required loadability margin. The margin was set at 109% instead of what is required by Criteria 1 (at or above 150%). This incident had been occurring since 1/7/2016 and was mitigated on 5/25/2018.

The root cause has been determined to be human error by the contractor who calculated and submitted the relay settings for the Dumont-Sorenson 345kV Facility and the check of work was less than adequate by the contractor who performed the setting calculations. The calculations were done correctly but were entered wrong during commissioning and there was no check of work prior to implementation.

Incident 2 & Incident 3: Breakers were added at North Proctorville Station splitting the existing line (Amos-Hanging Rock) into two Facilities -- Amos-N Proctorville 765kV and Hanging Rock-N Proctorville. The margin was set at Amos-North Proctorville 765kV at 111% instead what was required by Criteria 1 (at or above 150%). This incident had been occurring since 9/20/2017 and was mitigated on 3/9/2018. Hanging Rock-North Proctorville Facility was also reviewed and it was determined, that while currently compliant with PRC-023, there was a time of non-compliance during the project, from 1/25/2017 - 5/24/2017. The margin had been set at 121% instead of the 150% as required by Criteria one. This incident was mitigated on 5/24/2017 when revised settings were applied.

For the incidents at North Proctorville, the root cause was the lack of an internal control to prevent ratings changes without the review and approval of personnel responsible for determining the line relay trip limit and compliance of PRC-023, R1.

Relevant information regarding the identification of the violation(s):

Incident 1: On 5/15/2018, while performing an extent of condition review as part of a FAC-008 mitigation plan for a Facility Ratings issue, (Violation ID: RFC2016016427), AEP discovered that the applied relay settings on the Dumont-Sorenson 345kV Facility at Dumont did not have the required loadability margin.

Incident 2 & 3: On 3/5/2018, while performing an extent of condition review as part of a FAC-008 mitigation plan for a Facility Ratings issue, (Violation ID: RFC2016016427), AEP discovered that the relay settings for the Amos-N Proctorville 765kV facility did not have the required loadability margin from 9/20/2017 -

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February 07, 2019

3/9/2018 and the Hanging Rock-N Proctorville Facility did not have the required loadability margin from 1/25/2017 - 5/24/2017.

### Plan Details

Identify and describe the action plan, including specific tasks and actions that your organization is proposing to undertake, or which it undertook if this Mitigation Plan has been completed, to correct the violation(s) identified above in Section C.1 of this form:

Milestone 1: Corrected the reported issues

Milestone 2: Develop control/process that requires review/approval of Protection and Control Engineering (PCE) to allow for ratings changes for PRC-023 applicable Facilities. When the element data submitted to Transmission Planning results in a Facility Rating change, planning will obtain the sign-off from PCE, prior to implementing the change.

Milestone 3: Implement control/process that requires review/approval of Protection and Control Engineering (PCE) to allow for ratings changes for PRC-023 applicable Facilities.

Milestone 4: Conduct a Compliance Stand down with all appropriate personnel internal to AEP and external contractors who perform PRC-023 Compliance responsibilities. Remind those individuals of their responsibilities, expectations, and due diligence to perform an adequate check of work when calculating and submitting relay settings. Additionally, remind them of the new control that was developed and implemented (Milestones 2 & 3).

Provide the timetable for completion of the Mitigation Plan, including the completion date by which the Mitigation Plan will be fully implemented and the violations associated with this Mitigation Plan are corrected:

Proposed Completion date of Mitigation Plan: February 28, 2019

Milestone Activities, with completion dates, that your organization is proposing for this Mitigation Plan:

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
1 - Corrected the reported incidents' of non-adherence to PRC-023 R1	For the reported PRC-023 incidents', revised relay settings were applied to bring the Facilities into compliance with PRC-023 R1.	06/03/2018	05/25/2018		No
2 - Develop control/process to prevent ratings changes without review/approval	Develop a control/process to prevent ratings changes without the review/approval of personnel responsible for	09/01/2018	08/13/2018		No

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
	<p>determining the line relay trip limit. When the element data results in a Facility Rating change, sign-off will be obtained prior to implementing the change.</p> <p>AEP utilizes the highest Seasonal Rating, which is the Winter Emergency (WE) rating within RF. Whenever a Winter Emergency (WE) ratings change is being processed in the facility ratings database (Kremlin) on a PRC-023 applicable facility, the database will not allow WE ratings change on such facilities unless certain fields are filled out indicating that a review was performed by the appropriate group approving/denying the ratings change. Information contained in the database for the applicable facilities will lead the user to a ShareNow site, which will contain review evidence.</p>				
3 - Implement control/process to prevent ratings changes without the	Implement control/process that requires review/approval to	11/30/2018	11/13/2018		No

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
proper review/approval	allow for ratings changes for PRC-023 applicable Facilities. All PRC-023 applicable ratings changes shall be submitted to P&C Engineering for review prior to implementing the change. P&C Engineering will then confirm whether or not the ratings changes are compliant with PRC-023 prior to field implementation.				
4 - Compliance Stand Down	Conduct a Compliance Stand down with all appropriate personnel internal to AEP and external contractors who perform PRC-023 Compliance responsibilities. Remind those individuals of their responsibilities, expectations, and due diligence to perform an adequate check of work when calculating and submitting relay settings.	02/28/2019			No

Additional Relevant Information

## Reliability Risk

### Reliability Risk

While the Mitigation Plan is being implemented, the reliability of the bulk Power System may remain at higher Risk or be otherwise negatively impacted until the plan is successfully completed. To the extent they are known or anticipated : (i) Identify any such risks or impacts, and; (ii) discuss any actions planned or proposed to address these risks or impacts.

The violation posed a minimal risk and did not pose a serious or substantial risk to the Bulk Power System. At no time, during the Dumont incident, was the line loading more than 66% of the highest seasonal Facility Rating and at no time did the line loading exceed 61% of the established relay trip limit. At no time, during the North Proctorville incidents, was the line loading more than 19% of the highest seasonal Facility Rating and at no time did the line loading exceed 17% of the relay trip limits that were in effect at the time.

### Prevention

Describe how successful completion of this plan will prevent or minimize the probability further violations of the same or similar reliability standards requirements will occur

Develop and implement control/process to prevent ratings changes across all AEP regions without the review/approval of personnel responsible for determining the line relay trip limit. When the element data results in a Facility Rating change, sign-off will be obtained prior to implementing the change. AEP utilizes the highest Seasonal Rating, which is the Winter Emergency (WE) rating in RF. So, whenever Transmission Planning is processing a WE ratings change in the facility ratings database (Kremlin) on a PRC-023 applicable facility, Kremlin will not allow WE ratings change on such facilities unless certain fields are filled out indicating that a review was performed by P&C approving/denying the ratings change. Information contained in Kremlin for the applicable facilities will lead the user to the P&C ShareNow site, which will contain review evidence. Conduct a Compliance Stand down with all appropriate personnel internal to AEP and external contractors who perform PRC-023 Compliance responsibilities. Remind those individuals of their responsibilities, expectations, and due diligence to perform an adequate check of work when calculating and submitting relay settings

Describe any action that may be taken or planned beyond that listed in the mitigation plan, to prevent or minimize the probability of incurring further violations of the same or similar standards requirements

Authorization

An authorized individual must sign and date the signature page. By doing so, this individual, on behalf of your organization:

- \* Submits the Mitigation Plan, as presented, to the regional entity for acceptance and approval by NERC, and
- \* if applicable, certifies that the Mitigation Plan, as presented, was completed as specified.

Acknowledges:

1. I am qualified to sign this mitigation plan on behalf of my organization.
2. I have read and understand the obligations to comply with the mitigation plan requirements and ERO remedial action directives as well as ERO documents, including but not limited to, the NERC rules of procedure and the application NERC CMEP.
3. I have read and am familiar with the contents of the foregoing Mitigation Plan.

American Electric Power Service Corporation [ Legal name see comment below] Agrees to be bound by, Plan, including the timetable completion date, as accepted by the Regional Entity, NERC, and if required, the applicable governmental authority.

Authorized Individual Signature: \_\_\_\_\_  
(Electronic signature was received by the Regional Office via CDMS. For Electronic Signature Policy see CMEP.)

Authorized Individual

Name: Bob Bradish

Title: VP Transmission Planning and Engineering

Authorized On: February 04, 2019

## Mitigation Plan

### Mitigation Plan Summary

Registered Entity: American Electric Power Service Corporation [ Legal name see comment below]

Mitigation Plan Code:

Mitigation Plan Version: 1

<u>NERC Violation ID</u>	<u>Requirement</u>	<u>Violation Validated On</u>
RFC2018020206	PRC-023-3 R1.	

Mitigation Plan Submitted On: February 08, 2019

Mitigation Plan Accepted On:

Mitigation Plan Proposed Completion Date: February 28, 2019

Actual Completion Date of Mitigation Plan:

Mitigation Plan Certified Complete by AEP On:

Mitigation Plan Completion Verified by RF On:

Mitigation Plan Completed? (Yes/No): No

## Compliance Notices

Section 6.2 of the NERC CMEP sets forth the information that must be included in a Mitigation Plan. The Mitigation Plan must include:

- (1) The Registered Entity's point of contact for the Mitigation Plan, who shall be a person (i) responsible for filing the Mitigation Plan, (ii) technically knowledgeable regarding the Mitigation Plan, and (iii) authorized and competent to respond to questions regarding the status of the Mitigation Plan. This person may be the Registered Entity's point of contact described in Section B.
  - (2) The Alleged or Confirmed Violation(s) of Reliability Standard(s) the Mitigation Plan will correct.
  - (3) The cause of the Alleged or Confirmed Violation(s).
  - (4) The Registered Entity's action plan to correct the Alleged or Confirmed Violation(s).
  - (5) The Registered Entity's action plan to prevent recurrence of the Alleged or Confirmed violation(s).
  - (6) The anticipated impact of the Mitigation Plan on the bulk power system reliability and an action plan to mitigate any increased risk to the reliability of the bulk power-system while the Mitigation Plan is being implemented.
  - (7) A timetable for completion of the Mitigation Plan including the completion date by which the Mitigation Plan will be fully implemented and the Alleged or Confirmed Violation(s) corrected.
  - (8) Implementation milestones no more than three (3) months apart for Mitigation Plans with expected completion dates more than three (3) months from the date of submission. Additional violations could be determined or recommended to the applicable governmental authorities for not completing work associated with accepted milestones.
  - (9) Any other information deemed necessary or appropriate.
  - (10) The Mitigation Plan shall be signed by an officer, employee, attorney or other authorized representative of the Registered Entity, which if applicable, shall be the person that signed the Self Certification or Self Reporting submittals.
  - (11) This submittal form may be used to provide a required Mitigation Plan for review and approval by regional entity(ies) and NERC.
- The Mitigation Plan shall be submitted to the regional entity(ies) and NERC as confidential information in accordance with Section 1500 of the NERC Rules of Procedure.
  - This Mitigation Plan form may be used to address one or more related alleged or confirmed violations of one Reliability Standard. A separate mitigation plan is required to address alleged or confirmed violations with respect to each additional Reliability Standard, as applicable.
  - If the Mitigation Plan is accepted by regional entity(ies) and approved by NERC, a copy of this Mitigation Plan will be provided to the Federal Energy Regulatory Commission or filed with the applicable governmental authorities for approval in Canada.
  - Regional Entity(ies) or NERC may reject Mitigation Plans that they determine to be incomplete or inadequate.
  - Remedial action directives also may be issued as necessary to ensure reliability of the bulk power system.
  - The user has read and accepts the conditions set forth in these Compliance Notices.

Entity Information

Identify your organization:

Entity Name: American Electric Power Service Corporation [ Legal name see comment below]

NERC Compliance Registry ID: NCR00682

Address: 1 Riverside Plaza  
Columbus OH 43215

Identify the individual in your organization who will serve as the Contact to the Regional Entity regarding this Mitigation Plan. This person shall be technically knowledgeable regarding this Mitigation Plan and authorized to respond to Regional Entity regarding this Mitigation Plan:

Name: Darrel A Grumman  
Title: Sr NERC Compliance Specialist  
Email: dgrumman@aep.com  
Phone: 614-716-2362

Violation(s)

This Mitigation Plan is associated with the following violation(s) of the reliability standard listed below:

Violation ID	Date of Violation	Requirement
Requirement Description		
RFC2018020206	01/07/2016	PRC-023-3 R1.
<p>Each Transmission Owner, Generator Owner, and Distribution Provider shall use any one of the following criteria (Requirement R1, criteria 1 through 13) for any specific circuit terminal to prevent its phase protective relay settings from limiting transmission system loadability while maintaining reliable protection of the BES for all fault conditions. Each Transmission Owner, Generator Owner, and Distribution Provider shall evaluate relay loadability at 0.85 per unit voltage and a power factor angle of 30 degrees.</p> <p>Criteria:</p> <ol style="list-style-type: none"> <li>1. Set transmission line relays so they do not operate at or below 150% of the highest seasonal Facility Rating of a circuit, for the available defined loading duration nearest 4 hours (expressed in amperes).</li> <li>2. Set transmission line relays so they do not operate at or below 115% of the highest seasonal 15-minute Facility Rating of a circuit (expressed in amperes).</li> <li>3. Set transmission line relays so they do not operate at or below 115% of the maximum theoretical power transfer capability (using a 90-degree angle between the sending-end and receiving-end voltages and either reactance or complex impedance) of the circuit (expressed in amperes) using one of the following to perform the power transfer calculation:                         <ul style="list-style-type: none"> <li>• An infinite source (zero source impedance) with a 1.00 per unit bus voltage at each end of the line.</li> <li>• An impedance at each end of the line, which reflects the actual system source impedance with a 1.05 per unit voltage behind each source impedance.</li> </ul> </li> <li>4. Set transmission line relays on series compensated transmission lines so they do not operate at or below the maximum power transfer capability of the line, determined as the greater of:                         <ul style="list-style-type: none"> <li>• 115% of the highest emergency rating of the series capacitor.</li> <li>• 115% of the maximum power transfer capability of the circuit (expressed in amperes), calculated in accordance with Requirement R1, criterion 3, using the full line inductive reactance.</li> </ul> </li> <li>5. Set transmission line relays on weak source systems so they do not operate at or below 170% of the maximum end-of-line three-phase fault magnitude (expressed in amperes).</li> <li>6. Not used.</li> <li>7. Set transmission line relays applied at the load center terminal, remote from generation stations, so they do not operate at or below 115% of the maximum current flow from the load to the generation source under any system configuration.</li> <li>8. Set transmission line relays applied on the bulk system-end of transmission lines that serve load remote to the system so they do not operate at or below 115% of the maximum current flow from the system to the load under any system configuration.</li> <li>9. Set transmission line relays applied on the load-end of transmission lines that serve load remote to the bulk system so they do not operate at or below 115% of the maximum current flow from the load to the system under any system configuration.</li> <li>10. Set transformer fault protection relays and transmission line relays on transmission lines terminated only with a transformer so that the relays do not operate at or below the greater of:                         <ul style="list-style-type: none"> <li>• 150% of the applicable maximum transformer nameplate rating (expressed in amperes), including the forced cooled ratings corresponding to all installed supplemental cooling equipment.</li> <li>• 115% of the highest operator established emergency transformer rating.</li> </ul> </li> <li>10.1 Set load-responsive transformer fault protection relays, if used, such that the protection settings do not expose the transformer to a fault level and duration that exceeds the transformer's mechanical withstand capability .</li> <li>11. For transformer overload protection relays that do not comply with the loadability component of Requirement R1, criterion 10 set the relays according to one of the following:                         <ul style="list-style-type: none"> <li>• Set the relays to allow the transformer to be operated at an overload level of at least 150% of the maximum applicable nameplate rating, or 115% of the highest operator established emergency transformer rating, whichever is</li> </ul> </li> </ol>		

Violation ID	Date of Violation	Requirement
Requirement Description		
RFC2018020206	01/07/2016	PRC-023-3 R1.
<p>greater, for at least 15 minutes to provide time for the operator to take controlled action to relieve the overload.</p> <ul style="list-style-type: none"> <li>• Install supervision for the relays using either a top oil or simulated winding hot spot temperature element set no less than 100° C for the top oil temperature or no less than 140° C for the winding hot spot temperature .</li> </ul> <p>12. When the desired transmission line capability is limited by the requirement to adequately protect the transmission line, set the transmission line distance relays to a maximum of 125% of the apparent impedance (at the impedance angle of the transmission line) subject to the following constraints:</p> <ol style="list-style-type: none"> <li>a. Set the maximum torque angle (MTA) to 90 degrees or the highest supported by the manufacturer.</li> <li>b. Evaluate the relay loadability in amperes at the relay trip point at 0.85 per unit voltage and a power factor angle of 30 degrees.</li> <li>c. Include a relay setting component of 87% of the current calculated in Requirement R1, criterion 12 in the Facility Rating determination for the circuit.</li> </ol> <p>13. Where other situations present practical limitations on circuit capability, set the phase protection relays so they do not operate at or below 115% of such limitations.</p>		

Brief summary including the cause of the violation(s) and mechanism in which it was identified:

This mitigation plan addresses instances at three facilities, impacting compliance for PRC-023, R1 where the transmission relay trip limit was not set at or above 150% of the highest seasonal Facility Rating of a circuit per Criteria 1.

There are two causes among these three incidents.

Incident 1: At Dumont 345kV station, the applied relay settings on the Dumont-Sorenson 345kV Facility did not have the required loadability margin. The margin was set at 109% instead of what is required by Criteria 1 (at or above 150%). This incident had been occurring since 1/7/2016 and was mitigated on 5/25/2018.

The root cause has been determined to be human error by the contractor who calculated and submitted the relay settings for the Dumont-Sorenson 345kV Facility and the check of work was less than adequate by the contractor who performed the setting calculations. The calculations were done correctly but were entered wrong during commissioning and there was no check of work prior to implementation.

Incident 2 & Incident 3: Breakers were added at North Proctorville Station splitting the existing line (Amos-Hanging Rock) into two Facilities -- Amos-N Proctorville 765kV and Hanging Rock-N Proctorville. The margin was set at Amos-North Proctorville 765kV at 111% instead what was required by Criteria 1 (at or above 150%). This incident had been occurring since 9/20/2017 and was mitigated on 3/9/2018. Hanging Rock-North Proctorville Facility was also reviewed and it was determined, that while currently compliant with PRC-023, there was a time of non-compliance during the project, from 1/25/2017 - 5/24/2017. The margin had been set at 121% instead of the 150% as required by Criteria one. This incident was mitigated on 5/24/2017 when revised settings were applied.

For the incidents at North Proctorville, the root cause was the lack of an internal control to prevent ratings changes without the review and approval of personnel responsible for determining the line relay trip limit and compliance of PRC-023, R1.

Relevant information regarding the identification of the violation(s):

Incident 1: On 5/15/2018, while performing an extent of condition review as part of a FAC-008 mitigation plan for a Facility Ratings issue, (Violation ID: RFC2016016427), AEP discovered that the applied relay settings on the Dumont-Sorenson 345kV Facility at Dumont did not have the required loadability margin.

Incident 2 & 3: On 3/5/2018, while performing an extent of condition review as part of a FAC-008 mitigation

plan for a Facility Ratings issue, (Violation ID: RFC2016016427), AEP discovered that the relay settings for the Amos-N Proctorville 765kV facility did not have the required loadability margin from 9/20/2017 - 3/9/2018 and the Hanging Rock-N Proctorville Facility did not have the required loadability margin from 1/25/2017 - 5/24/2017.

Plan Details

Identify and describe the action plan, including specific tasks and actions that your organization is proposing to undertake, or which it undertook if this Mitigation Plan has been completed, to correct the violation(s) identified above in Section C.1 of this form:

Milestone 1: Corrected the reported issues

Milestone 2: Develop control/process that requires review/approval of Protection and Control Engineering (PCE) to allow for ratings changes for PRC-023 applicable Facilities. When the element data submitted to Transmission Planning results in a Facility Rating change, planning will obtain the sign-off from PCE, prior to implementing the change.

Milestone 3: Implement control/process that requires review/approval of Protection and Control Engineering (PCE) to allow for ratings changes for PRC-023 applicable Facilities.

Milestone 4: Conduct a Compliance Stand down with all appropriate personnel internal to AEP and external contractors who perform PRC-023 Compliance responsibilities. Remind those individuals of their responsibilities, expectations, and due diligence to perform an adequate check of work when calculating and submitting relay settings. Additionally, remind them of the new control that was developed and implemented (Milestones 2 & 3).

Provide the timetable for completion of the Mitigation Plan, including the completion date by which the Mitigation Plan will be fully implemented and the violations associated with this Mitigation Plan are corrected:

Proposed Completion date of Mitigation Plan: February 28, 2019

Milestone Activities, with completion dates, that your organization is proposing for this Mitigation Plan:

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
1 - Corrected the reported incidents' of non-adherence to PRC-023 R1	For the reported PRC-023 incidents', revised relay settings were applied to bring the Facilities into compliance with PRC-023 R1	06/03/2018	05/25/2018		No
2 - Develop control/process to prevent ratings changes without review/approval	Develop a control/process to prevent ratings changes without the	09/01/2018	08/13/2018		No

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
	<p>review/approval of personnel responsible for determining the line relay trip limit. When the element data results in a Facility Rating change, sign-off will be obtained prior to implementing the change.</p> <p>AEP utilizes the highest Seasonal Rating, which is the Winter Emergency (WE) rating within RF. Whenever a Winter Emergency (WE) ratings change is being processed in the facility ratings database (Kremlin) on a PRC-023 applicable facility, the database will not allow WE ratings change on such facilities unless certain fields are filled out indicating that a review was performed by the appropriate group approving/denying the ratings change. Information contained in the database for the applicable facilities will lead the user to a ShareNow site, which will contain review evidence.</p>				
3 - Implement control/process to	Implement	11/30/2018	11/13/2018		No

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
prevent ratings changes without the proper review/approval	control/process that requires review/approval to allow for ratings changes for PRC-023 applicable Facilities. All PRC-023 applicable ratings changes shall be submitted to P&C Engineering for review prior to implementing the change. P&C Engineering will then confirm whether or not the ratings changes are compliant with PRC-023 prior to field implementation.				
4 - Compliance Stand Down	Conduct a Compliance Stand down with all appropriate personnel internal to AEP and external contractors who perform PRC-023 Compliance responsibilities. Remind those individuals of their responsibilities, expectations, and due diligence to perform an adequate check of work when calculating and submitting relay settings.	02/28/2019			No

Additional Relevant Information

Reliability Risk

## Reliability Risk

While the Mitigation Plan is being implemented, the reliability of the bulk Power System may remain at higher Risk or be otherwise negatively impacted until the plan is successfully completed. To the extent they are known or anticipated : (i) Identify any such risks or impacts, and; (ii) discuss any actions planned or proposed to address these risks or impacts.

The violation posed a minimal risk and did not pose a serious or substantial risk to the Bulk Power System. At no time, during the Dumont incident, was the line loading more than 66% of the highest seasonal Facility Rating and at no time did the line loading exceed 61% of the established relay trip limit. At no time, during the North Proctorville incidents, was the line loading more than 19% of the highest seasonal Facility Rating and at no time did the line loading exceed 17% of the relay trip limits that were in effect at the time.

## Prevention

Describe how successful completion of this plan will prevent or minimize the probability further violations of the same or similar reliability standards requirements will occur

Develop and implement control/process to prevent ratings changes across all AEP regions without the review/approval of personnel responsible for determining the line relay trip limit. When the element data results in a Facility Rating change, sign-off will be obtained prior to implementing the change. AEP utilizes the highest Seasonal Rating, which is the Winter Emergency (WE) rating in RF. So, whenever Transmission Planning is processing a WE ratings change in the facility ratings database (Kremlin) on a PRC-023 applicable facility, Kremlin will not allow WE ratings change on such facilities unless certain fields are filled out indicating that a review was performed by P&C approving/denying the ratings change. Information contained in Kremlin for the applicable facilities will lead the user to the P&C ShareNow site, which will contain review evidence. Conduct a Compliance Stand down with all appropriate personnel internal to AEP and external contractors who perform PRC-023 Compliance responsibilities. Remind those individuals of their responsibilities, expectations, and due diligence to perform an adequate check of work when calculating and submitting relay settings

Describe any action that may be taken or planned beyond that listed in the mitigation plan, to prevent or minimize the probability of incurring further violations of the same or similar standards requirements

Authorization

An authorized individual must sign and date the signature page. By doing so, this individual, on behalf of your organization:

- \* Submits the Mitigation Plan, as presented, to the regional entity for acceptance and approval by NERC, and
- \* if applicable, certifies that the Mitigation Plan, as presented, was completed as specified.

Acknowledges:

1. I am qualified to sign this mitigation plan on behalf of my organization.
2. I have read and understand the obligations to comply with the mitigation plan requirements and ERO remedial action directives as well as ERO documents, including but not limited to, the NERC rules of procedure and the application NERC CMEP.
3. I have read and am familiar with the contents of the foregoing Mitigation Plan.

American Electric Power Service Corporation [ Legal name see comment below] Agrees to be bound by, Plan, including the timetable completion date, as accepted by the Regional Entity, NERC, and if required, the applicable governmental authority.

Authorized Individual Signature: \_\_\_\_\_

(Electronic signature was received by the Regional Office via CDMS. For Electronic Signature Policy see CMEP.)

Authorized Individual

Name: bob Bradish

Title: VP Transmission Planning and Engineering

Authorized On: February 04, 2019

### Certification of Mitigation Plan Completion

Submittal of a Certification of Mitigation Plan Completion shall include data or information sufficient for the Regional Entity to verify completion of the Mitigation Plan. The Regional Entity may request additional data or information and conduct follow-up assessments, on-site or other Spot Checking, or Compliance Audits as it deems necessary to verify that all required actions in the Mitigation Plan have been completed and the Registered Entity is in compliance with the subject Reliability Standard. (CMEP Section 6.6)

Registered Entity Name: American Electric Power Service Corporation [ Legal name see comment below]

NERC Registry ID: NCR00682

NERC Violation ID(s): RFC2018018935

Mitigated Standard Requirement(s): PRC-023-2 R1.

Scheduled Completion as per Accepted Mitigation Plan: November 13, 2018

Date Mitigation Plan completed: November 13, 2018

RF Notified of Completion on Date: November 27, 2018

Entity Comment:

Additional Documents			
From	Document Name	Description	Size in Bytes
Entity	MP-305 Certification Package Signed.pdf		3,352,616

I certify that the Mitigation Plan for the above named violation(s) has been completed on the date shown above and that all submitted information is complete and correct to the best of my knowledge.

Name: robert Bradish

Title: VP Planning & Engineering

Email: rwbradish@aep.com

Phone: 1 (614) 933-2300

Authorized Signature \_\_\_\_\_ Date \_\_\_\_\_

(Electronic signature was received by the Regional Office via CDMS. For Electronic Signature Policy see CMEP.)

### Certification of Mitigation Plan Completion

Submittal of a Certification of Mitigation Plan Completion shall include data or information sufficient for the Regional Entity to verify completion of the Mitigation Plan. The Regional Entity may request additional data or information and conduct follow-up assessments, on-site or other Spot Checking, or Compliance Audits as it deems necessary to verify that all required actions in the Mitigation Plan have been completed and the Registered Entity is in compliance with the subject Reliability Standard. (CMEP Section 6.6)

Registered Entity Name: American Electric Power Service Corporation [ Legal name see comment below]

NERC Registry ID: NCR00682

NERC Violation ID(s): RFC2018020205

Mitigated Standard Requirement(s): PRC-023-4 R1.

Scheduled Completion as per Accepted Mitigation Plan: February 28, 2019

Date Mitigation Plan completed: February 01, 2019

RF Notified of Completion on Date: February 20, 2019

Entity Comment:

Additional Documents			
From	Document Name	Description	Size in Bytes
Entity	MP-354 Completion Certification Package Signed.pdf		1,899,747

I certify that the Mitigation Plan for the above named violation(s) has been completed on the date shown above and that all submitted information is complete and correct to the best of my knowledge.

Name: Bob Bradish

Title: VP Transmission Planning and Engineering

Email: rwbradish@aep.com

Phone: 1 (614) 933-2300

Authorized Signature \_\_\_\_\_ Date \_\_\_\_\_

(Electronic signature was received by the Regional Office via CDMS. For Electronic Signature Policy see CMEP.)

### Certification of Mitigation Plan Completion

Submittal of a Certification of Mitigation Plan Completion shall include data or information sufficient for the Regional Entity to verify completion of the Mitigation Plan. The Regional Entity may request additional data or information and conduct follow-up assessments, on-site or other Spot Checking, or Compliance Audits as it deems necessary to verify that all required actions in the Mitigation Plan have been completed and the Registered Entity is in compliance with the subject Reliability Standard. (CMEP Section 6.6)

Registered Entity Name: American Electric Power Service Corporation [ Legal name see comment below]

NERC Registry ID: NCR00682

NERC Violation ID(s): RFC2018020206

Mitigated Standard Requirement(s): PRC-023-3 R1.

Scheduled Completion as per Accepted Mitigation Plan: February 28, 2019

Date Mitigation Plan completed: February 07, 2019

RF Notified of Completion on Date: February 20, 2019

Entity Comment:

Additional Documents			
From	Document Name	Description	Size in Bytes
Entity	MP-354 Completion Certification Package Signed.pdf		1,899,747

I certify that the Mitigation Plan for the above named violation(s) has been completed on the date shown above and that all submitted information is complete and correct to the best of my knowledge.

Name: bob Bradish

Title: VP Transmission Planning and Engineering

Email: rwbradish@aep.com

Phone: 1 (614) 933-2300

Authorized Signature \_\_\_\_\_ Date \_\_\_\_\_

(Electronic signature was received by the Regional Office via CDMS. For Electronic Signature Policy see CMEP.)



## Mitigation Plan Verification for RFC2018018935

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American Electric Power Service Corporation (“AEP”)

**Standard/Requirement:** PRC-023-2 R1

**NERC Mitigation Plan ID:** RFCMIT014214

**Method of Disposition:** Not yet determined

Relevant Dates					
Initiating Document	Mitigation Plan Submittal	RF Acceptance	NERC Approval	Certification Submittal	Date of Completion
Self-Report 12/21/17	10/25/18	10/28/18	11/21/18	11/27/18	11/13/18

### Description of Issue

[Mitigation Task RFC2018018935](#)

Evidence Reviewed		
File Name	Description of Evidence	Standard/Req.
File 1	MP-305 Certification Package Signed	PRC-023-2 R1

### Verification of Mitigation Plan Completion

**Milestone 1:** Corrected the five reported incidents of non-adherence to PRC-023 R1

Proposed Completion Date: February 15, 2018

Actual Completion Date: December 5, 2017

File 1, “*MP-305 Certification Package Signed*”, Documentation, Pages 6 through 22, include screenshots from IPS, with the completion (i.e., revised relay settings Active and In Service) highlighted in blue in the “Relay Settings” section at the bottom of each screenshot (Pages 7, 14



through 18, and 20). Also included in some cases are copies of associated e-mails, as required to provide additional details (Pages 6, 8 through 13, 19, 21 and 22).

NOTE: Four of the reported PRC-023 incidents, revised relay settings were applied to bring the Facilities into compliance with PRC-023 R1. For the fourth incident, the impacted protection relay was disconnected as the Relay Trip Limit did not meet the requirements of Criteria 1 of the Standard and was no longer needed.

Milestone # 1 Completion verified.

**Milestone 2:** Reviewed the facilities rating database to determine if there are any PRC-023 R1 compliance concerns based on current data.

Proposed Completion Date: May 16, 2018

Actual Completion Date: April 25, 2018

File 1, “*MP-305 Certification Package Signed*”, Page 25, includes a list of the PRC-023 applicable Facilities where the Relay Setting and Winter Emergency ratings were reviewed to determine if the loadability requirement was being met. No protective relay settings were found to be limiting the loadability of any circuit subject to NERC PRC-023-4 requirements.

Milestone # 2 Completion verified.

**Milestone 3:** Develop control/process to prevent ratings changes without review/approval.

Proposed Completion Date: August 13, 2018

Actual Completion Date: August 9, 2018

File 1, “*MP-305 Certification Package Signed*”, Page 27, includes the flowchart, which illustrates the process to be initiated whenever planning is processing a WE ratings change in the facility ratings database (Kremlin) on a PRC-023 applicable facility.

Milestone # 3 Completion verified.

**Milestone 4:** Implement control/process to prevent ratings changes without the proper review/approval.

Proposed Completion Date: November 13, 2018



Actual Completion Date: November 13, 2018

File 1, “*MP-305 Certification Package Signed*”, Pages 29 through 35, includes the control/process that was implemented which requires review/approval to allow for ratings changes for PRC-023 applicable Facilities.

Milestone # 4 Completion verified.

The Mitigation Plan is hereby verified complete.

A handwritten signature in black ink, appearing to be 'Anthony Jablonski'.

Date: January 10, 2019

Anthony Jablonski  
Manager, Risk Analysis & Mitigation  
ReliabilityFirst Corporation



## Mitigation Plan Verification for RFC2018020206

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American Electric Power Service Corporation (“AEP”)

**Standard/Requirement:** PRC-023-3 R1

**NERC Mitigation Plan ID:** RFCMIT014373

**Method of Disposition:** Not yet determined

Relevant Dates					
Initiating Document	Mitigation Plan Submittal	RF Acceptance	NERC Approval	Certification Submittal	Date of Completion
Self-Report 08/02/18	02/08/19	02/11/19	03/06/19	02/20/19	02/07/19

### Description of Issue

[Mitigation Task RFC2018020206](#)

Evidence Reviewed		
File Name	Description of Evidence	Standard/Req.
File 1	MP-354 Completion Certification Package Signed	PRC-023-3 R1

### Verification of Mitigation Plan Completion

**Milestone 1:** Corrected the reported incidents of non-adherence to PRC-023 R1.

Proposed Completion Date: June 3, 2018

Actual Completion Date: May 25, 2018

File 1, “*MP-354 Completion Certification Package Signed*”, includes the following three evidence files:



1. Amos North Proctorville Milestone 1 Evidence.pdf - Pages 5 through 11, consist of details and screenshots depicting the timeframe of compliance to non-compliance then back to compliance with regards to PRC-023-4 R1.
2. Dumont Sorenson Milestone 1 Evidence.pdf - Pages 12 through 15, consist of details and screenshots depicting the timeframe of non-compliance then back to compliance with regards to PRC-023-4 R1.
3. Hanging Rock - N Proctorville Milestone 1 Evidence.pdf - Pages 16 and 17, consist of details and screenshots depicting the timeframe of compliance to non-compliance then back to compliance with regards to PRC-023-4 R1.

Milestone # 1 Completion verified.

**Milestone 2:** Develop control/process to prevent ratings changes without review/approval.

Proposed Completion Date: September 1, 2018

Actual Completion Date: August 13, 2018

File 1, “MP-354 Completion Certification Package Signed”, includes the following evidence file:

PRC-023 Preventative Control.pdf – Page 16, consists of the flowchart which illustrates the compliance control process that will be initiated whenever planning is processing a WE ratings change in the facility ratings database (Kremlin) on a PRC-023 applicable facility. Kremlin will not allow WE ratings change on such facilities unless certain fields are filled out indicating that a review was performed by P&C approving/denying the ratings change.

Information contained in Kremlin for the applicable facilities will lead the user to the P&C ShareNow site, which will contain review evidence. AEP Transmission will be able to run queries on the ShareNow site/Kremlin providing more visibility on pending/completed/non-initiated reviews.

Milestone # 2 Completion verified.

**Milestone 3:** Implement control/process to prevent ratings changes without the proper review/approval.

Proposed Completion Date: November 30, 2018



Actual Completion Date: November 13, 2018

File 1, “*MP-354 Completion Certification Package Signed*”, includes the following evidence files:

1. PRC-023 PCE Verification Submit Request.pdf
  - Page 21, consists of a Quick Reference Card (QRC) for requests to P&C Engineering for verification of a relay trip limit. All PRC-23 applicable ratings changes shall be submitted to P&C Engineering for relay trip limit review prior to implementing the change.
2. PRC-023 PCE Verification Complete Request.pdf
  - o Pages 22 and 23, consist of a second QRC for Complete Verification Requests. An automatically created email will notify all Region Engineers that a new request is available for review.
3. PRC-023 ShareNow - New Request.pdf – Page 24, consists of an example of a new request based on the QRC for submitting a request.
4. PRC-023 ShareNow - Complete Test.pdf – Page 25, consists of an example of a completed request within the ShareNow site for P&C Engineering.
5. PRC-023 Kremlin Enhancements East Transmission Planning.pdf – Pages 26 and 27, consist of details for the PRC-023 “flag” within the Kremlin database.

Milestone # 3 Completion verified.

***Milestone 4:*** Compliance Stand Down.

Proposed Completion Date: February 28, 2019

Actual Completion Date: February 7, 2019

File 1, “*MP-354 Completion Certification Package Signed*”, includes the following evidence files:

- PRC-023 Compliance Stand Down.ppt – Pages 29 through 33, consist of the PowerPoint delivered during the quarterly AEP PCE Relay Settings meeting.
- AEP PCE Relay Settings Community of Practice Invite Agenda Participation.pdf –
  - o Page 34, consists of the meeting invite along with a screenshot of the agenda



- Pages 35 and 36, include a list of participants (individuals were in person or remotely dialed in through web conference).

Milestone # 4 Completion verified.

The Mitigation Plan is hereby verified complete.

A handwritten signature in black ink, appearing to read 'Anthony Jablonski'.

Date: March 7, 2019

Anthony Jablonski  
Manager, Risk Analysis & Mitigation  
ReliabilityFirst Corporation



## Mitigation Plan Verification for RFC2018020205

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American Electric Power Service Corporation (“AEP”)

**Standard/Requirement:** PRC-023-4 R1

**NERC Mitigation Plan ID:** RFCMIT014372

**Method of Disposition:** Not yet determined

Relevant Dates					
Initiating Document	Mitigation Plan Submittal	RF Acceptance	NERC Approval	Certification Submittal	Date of Completion
Self-Report 08/02/18	02/07/19	02/11/19	03/06/19	02/20/19	02/07/19

### Description of Issue

[Mitigation Task RFC2018020205](#)

Evidence Reviewed		
File Name	Description of Evidence	Standard/Req.
File 1	MP-354 Completion Certification Package Signed	PRC-023-4 R1

### Verification of Mitigation Plan Completion

**Milestone 1:** Corrected the reported incidents of non-adherence to PRC-023 R1.

Proposed Completion Date: June 3, 2018

Actual Completion Date: May 25, 2018

File 1, “*MP-354 Completion Certification Package Signed*”, includes the following three evidence files:



1. Amos North Proctorville Milestone 1 Evidence.pdf -Pages 5 through 11, consist of details and screenshots depicting the timeframe of compliance to non-compliance then back to compliance with regards to PRC-023-4 R1.
2. Dumont Sorenson Milestone 1 Evidence.pdf -Pages 12 through 15, consist of details and screenshots depicting the timeframe of non-compliance then back to compliance with regards to PRC-023-4 R1.
3. Hanging Rock - N Proctorville Milestone 1 Evidence.pdf -Pages 16 and 17, consist of details and screenshots depicting the timeframe of compliance to non-compliance then back to compliance with regards to PRC-023-4 R1.

Milestone # 1 Completion verified.

**Milestone 2:** Develop control/process to prevent ratings changes without review/approval.

Proposed Completion Date: September 1, 2018

Actual Completion Date: August 13, 2018

File 1, “*MP-354 Completion Certification Package Signed*”, includes the following evidence file:

- PRC-023 Preventative Control.pdf –Page 16, consists of the flowchart which illustrates the compliance control process that will be initiated whenever planning is processing a WE ratings change in the facility ratings database (Kremlin) on a PRC-023 applicable facility. Kremlin will not allow WE ratings change on such facilities unless certain fields are filled out indicating that a review was performed by P&C approving/denying the ratings change. Information contained in Kremlin for the applicable facilities will lead the user to the P&C ShareNow site, which will contain review evidence. AEP Transmission will be able to run queries on the ShareNow site/Kremlin providing more visibility on pending/completed/non-initiated reviews.

Milestone # 2 Completion verified.

**Milestone 3:** Implement control/process to prevent ratings changes without the proper review/approval.

Proposed Completion Date: November 30, 2018



Actual Completion Date: November 13, 2018

File 1, “*MP-354 Completion Certification Package Signed*”, includes the following evidence files:

1. PRC-023 PCE Verification Submit Request.pdf
  - Page 21, consists of a Quick Reference Card (QRC) for requests to P&C Engineering for verification of a relay trip limit. All PRC-23 applicable ratings changes shall be submitted to P&C Engineering for relay trip limit review prior to implementing the change.
2. PRC-023 PCE Verification Complete Request.pdf
  - o Pages 22 and 23 consist of a second QRC for Complete Verification Requests. An automatically created email will notify all Region Engineers that a new request is available for review.
3. PRC-023 ShareNow - New Request.pdf – Page 24 consists of an example of a new request based on the QRC for submitting a request.
4. PRC-023 ShareNow - Complete Test.pdf – Page 25 consists of an example of a completed request within the ShareNow site for P&C Engineering.
5. PRC-023 Kremlin Enhancements East Transmission Planning.pdf – PDF Pages 26 and 27 consist of details for the PRC-023 “flag” within the Kremlin database.

Milestone # 3 Completion verified.

***Milestone 4:*** Compliance Stand Down.

Proposed Completion Date: February 28, 2019

Actual Completion Date: February 7, 2019

File 1, “*MP-354 Completion Certification Package Signed*”, includes the following evidence files:

- PRC-023 Compliance Stand Down.ppt – Pages 29 through 33, consist of the PowerPoint delivered during the quarterly AEP PCE Relay Settings meeting.
- AEP PCE Relay Settings Community of Practice Invite Agenda Participation.pdf –



- Page 34, consists of the meeting invite along with a screenshot of the agenda
- Pages 35 and 36, include a list of participants (individuals were in person or remotely dialed in through web conference).

Milestone # 4 Completion verified.

The Mitigation Plan is hereby verified complete.

A handwritten signature in black ink, appearing to be 'Anthony Jablonski'.

Date: March 7, 2019

Anthony Jablonski  
Manager, Risk Analysis & Mitigation  
ReliabilityFirst Corporation

### Self Report

Entity Name: AEP Generation Resources Inc. (AEPGR)

NERC ID: NCR11401

Standard: FAC-008-3

Requirement: FAC-008-3 R6.

Date Submitted: January 26, 2018

Has this violation previously No  
been reported or discovered?:

### Entity Information:

Joint Registration  
Organization (JRO) ID:

Coordinated Functional  
Registration (CFR) ID:

Contact Name: Nicholas Morton

Contact Phone: 6147162342

Contact Email: namorton@aep.com

### Violation:

Violation Start Date: January 01, 2014

End/Expected End Date: January 30, 2017

Reliability Functions: Generator Owner (GO)

Is Possible Violation still No  
occurring?:

Number of Instances: 1

Has this Possible Violation No  
been reported to other  
Regions?:

Which Regions:

Date Reported to Regions:

Detailed Description and Cause of Possible Violation: An Engineering review of generators was performed to gather additional documentation to support equipment ratings identified in the FAC-008 datasheets. During this review, additional information was found to specify ratings for associated Isolated (ISO) phase bus. Engineering discovered that ISO bus equipment ratings from Engineering correspondence used to identify the ratings did not match vendor drawings for Gas Turbines (GTs) located at the Lawrenceburg and Waterford Combined Cycle (CC) Units. As a result, the GT ISO phase bus ratings were incorrect for the Lawrenceburg and Waterford CC Units. Revision to the FAC-008 One Line drawings for Waterford and Lawrenceburg were needed to accurately reflect the revised ISO phase bus ratings and as a result became the Most Limiting Series Element (MLSE).

The generation FAC-008 methodology, as written, was followed by generation and considered all the elements of the standard. The root cause has been identified as incorrect equipment rating caused an incorrect MLSE being identified on the Lawrenceburg and Waterford CC units.

### Mitigating Activities:

Description of Mitigating Mitigating Activities as follows:  
Activities and Preventative

Measure: 1) An extent of condition review was completed on all ISO phase bus ratings on the AEP generation fleet. No findings resulted. (completed May 2017)

Self Report

2) In the past, AEP Engineering used the lower summer rating on the ISO phase bus year round thus using the more conservative approach since typical design of this bus would allow for ample capacity to not be limiting element to generator. Engineering determined a need to revise the generation FAC-008 methodology to provide for seasonal ISO phase bus rating to consider increased MVA capacities for lower ambient temperatures in the winter months due to ISO bus limitations on the Waterford and Lawrenceburg Units. (January 2017)

3) Preventative control put in place for change management of equipment that would allow multi director sign off from the various disciplines within AEP Generation Engineering and Projects department to capture any NERC related reviews required prior to the initiation of projects. A review of proposed changes would be completed and require director approval prior to commencing project. (June 2017).

Date Mitigating Activities May 03, 2017  
Completed:

Impact and Risk Assessment:

Potential Impact to BPS: Minimal

Actual Impact to BPS: Minimal

Description of Potential and Operational data shows that generation was not impacted by powerflows  
Actual Impact to BPS: through ISO phase bus. The impact to BES was minimal.

Risk Assessment of Impact to Full scope of risk is under review by AEP's internal Risk Assessment  
BPS: Committee (RAC).

Additional Entity Comments: Per discussion with RF this self-report was noted with a incident date of 6/18/2007 however due to the RF AEPGR registration occurring not until 1/1/2014, this has been reported under FAC-008-3 R6 instead of FAC-009-1 R1. As such 1/1/2014 was used as the self report incident date.

Additional Comments		
From	Comment	User Name
No Comments		

Additional Documents			
From	Document Name	Description	Size in Bytes
No Documents			

## Mitigation Plan

### Mitigation Plan Summary

Registered Entity: AEP Generation Resources Inc.

Mitigation Plan Code:

Mitigation Plan Version: 2

<u>NERC Violation ID</u>	<u>Requirement</u>	<u>Violation Validated On</u>
RFC2018019116	FAC-008-3 R6.	

Mitigation Plan Submitted On: May 01, 2018

Mitigation Plan Accepted On:

Mitigation Plan Proposed Completion Date: September 29, 2017

Actual Completion Date of Mitigation Plan:

Mitigation Plan Certified Complete by AEPGR On: May 01, 2018

Mitigation Plan Completion Verified by RF On:

Mitigation Plan Completed? (Yes/No): No

## Compliance Notices

Section 6.2 of the NERC CMEP sets forth the information that must be included in a Mitigation Plan. The Mitigation Plan must include:

- (1) The Registered Entity's point of contact for the Mitigation Plan, who shall be a person (i) responsible for filing the Mitigation Plan, (ii) technically knowledgeable regarding the Mitigation Plan, and (iii) authorized and competent to respond to questions regarding the status of the Mitigation Plan. This person may be the Registered Entity's point of contact described in Section B.
  - (2) The Alleged or Confirmed Violation(s) of Reliability Standard(s) the Mitigation Plan will correct.
  - (3) The cause of the Alleged or Confirmed Violation(s).
  - (4) The Registered Entity's action plan to correct the Alleged or Confirmed Violation(s).
  - (5) The Registered Entity's action plan to prevent recurrence of the Alleged or Confirmed violation(s).
  - (6) The anticipated impact of the Mitigation Plan on the bulk power system reliability and an action plan to mitigate any increased risk to the reliability of the bulk power-system while the Mitigation Plan is being implemented.
  - (7) A timetable for completion of the Mitigation Plan including the completion date by which the Mitigation Plan will be fully implemented and the Alleged or Confirmed Violation(s) corrected.
  - (8) Implementation milestones no more than three (3) months apart for Mitigation Plans with expected completion dates more than three (3) months from the date of submission. Additional violations could be determined or recommended to the applicable governmental authorities for not completing work associated with accepted milestones.
  - (9) Any other information deemed necessary or appropriate.
  - (10) The Mitigation Plan shall be signed by an officer, employee, attorney or other authorized representative of the Registered Entity, which if applicable, shall be the person that signed the Self Certification or Self Reporting submittals.
  - (11) This submittal form may be used to provide a required Mitigation Plan for review and approval by regional entity(ies) and NERC.
- The Mitigation Plan shall be submitted to the regional entity(ies) and NERC as confidential information in accordance with Section 1500 of the NERC Rules of Procedure.
  - This Mitigation Plan form may be used to address one or more related alleged or confirmed violations of one Reliability Standard. A separate mitigation plan is required to address alleged or confirmed violations with respect to each additional Reliability Standard, as applicable.
  - If the Mitigation Plan is accepted by regional entity(ies) and approved by NERC, a copy of this Mitigation Plan will be provided to the Federal Energy Regulatory Commission or filed with the applicable governmental authorities for approval in Canada.
  - Regional Entity(ies) or NERC may reject Mitigation Plans that they determine to be incomplete or inadequate.
  - Remedial action directives also may be issued as necessary to ensure reliability of the bulk power system.
  - The user has read and accepts the conditions set forth in these Compliance Notices.

Entity Information

Identify your organization:

Entity Name: AEP Generation Resources Inc.

NERC Compliance Registry ID: NCR11401

Address: 155 Nationwide Blvd  
Columbus OH 43215

Identify the individual in your organization who will serve as the Contact to the Regional Entity regarding this Mitigation Plan. This person shall be technically knowledgeable regarding this Mitigation Plan and authorized to respond to Regional Entity regarding this Mitigation Plan:

Name: Nicholas Morton

Title: Principal, ENC

Email: namorton@aep.com

Phone: 614-716-2342

Violation(s)

This Mitigation Plan is associated with the following violation(s) of the reliability standard listed below:

Violation ID	Date of Violation	Requirement
Requirement Description		
RFC2018019116	01/01/2014	FAC-008-3 R6.
Each Transmission Owner and Generator Owner shall have Facility Ratings for its solely and jointly owned Facilities that are consistent with the associated Facility Ratings methodology or documentation for determining its Facility Ratings.		

Brief summary including the cause of the violation(s) and mechanism in which it was identified:

A January 2017 Engineering review of generators due an asset sale prompted a source data review of generation elements. During this review, additional information was found to specify ratings for associated ISO phase bus and thus a further review of the generation facility Most Limiting Series Element (MLSE) ratings was warranted in accordance to FAC-008 methodology. Engineering discovered that ISO bus equipment ratings from Engineering correspondence did not match vendor drawings at Lawrenceburg 1, Lawrenceburg 2, and Waterford 1 Gas Turbine's (GT's). As a result, the GT ISO phase bus rating was incorrect for Lawrenceburg GT1 and GT2, Lawrenceburg GT1 and GT2, and Waterford GT1, GT2, GT3. Revision to the one lines for Waterford and Lawrenceburg were needed to accurately reflect the revised rating of ISO phase bus and as a result become the MLSE for these combined cycle GT MVA ratings during the summer and winter at Lawrenceburg 1 and 2, and the summer for Waterford 1.

The generation FAC-008 methodology, as written, was followed by generation and considered all the elements of the standard. Incorrect equipment specification and resulting incorrect equipment rating resulted in an incorrect MLSE being identified on the Lawrenceburg and Waterford CC units.

Relevant information regarding the identification of the violation(s):

A January 2017 Engineering review of generators due an asset sale prompted a source data review of generation elements. During this review, additional information was found to specify ratings for associated ISO phase bus and thus a further review of the generation facility Most Limiting Series Element (MLSE) ratings was warranted in accordance to FAC-008 methodology. Engineering discovered that ISO bus equipment ratings from Engineering correspondence did not match vendor drawings at Lawrenceburg 1, Lawrenceburg 2, and Waterford 1 Gas Turbine's (GT's). As a result, the GT ISO phase bus rating was incorrect for Lawrenceburg GT1 and GT2, Lawrenceburg GT1 and GT2, and Waterford GT1, GT2, GT3. Revision to the one lines for Waterford and Lawrenceburg were needed to accurately reflect the revised rating of ISO phase bus and as a result become the MLSE for these combined cycle GT MVA ratings during the summer and winter at Lawrenceburg 1 and 2, and the summer for Waterford 1.

The generation FAC-008 methodology, as written, was followed by generation and considered all the elements of the standard. Incorrect equipment specification and resulting incorrect equipment rating resulted in an incorrect MLSE being identified on the Lawrenceburg and Waterford CC units.

Plan Details

Identify and describe the action plan, including specific tasks and actions that your organization is proposing to undertake, or which it undertook if this Mitigation Plan has been completed, to correct the violation(s) identified above in Section C.1 of this form:

- 1) Investigate, determine root cause, and extent of condition.
- 2) Initial mitigating activities to correct any findings
- 3) Conduct a peer review and determine if any other similar findings in other business units. Determine if reportable as a possible violation.
- 4) Provide documentation and supporting evidence of investigation, root cause and mitigating activities for internal AEP application.
- 5) Develop regional reporting for self report, followed by mitigation plan and provide updates as requested until region approval of completion of mitigation.
- 6) Within mitigation plan provide internal control(s) to detect and prevent reoccurrence.

Provide the timetable for completion of the Mitigation Plan, including the completion date by which the Mitigation Plan will be fully implemented and the violations associated with this Mitigation Plan are corrected:

Proposed Completion date of Mitigation Plan: September 29, 2017

Milestone Activities, with completion dates, that your organization is proposing for this Mitigation Plan:

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
1 - Verify OEM equipment specifications of effected equipment to compare to AEP data documentation	Contacted plant and manufacturer to verify equipment specification data is correct. A review of drawings and associated specifications conducted and updated as needed to correct any discrepancies. Any updates would initiate a review of Most Limiting Series Element (MLSE) results with an Engineering analysis to verify accurate MLSE.	03/31/2017	01/27/2017		No

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
2 - Comprehensive reivew of Isolated phase bus ratings for AEP generation fleet	Generation and Electrical Interconnection Planning (GEIP) group performed a comprehensive review of Isolated Phase Bus (IPB) ratings for all AEP generating units. GEIP reviewed one-lines, vendor drawings, bill of materials and spec sheets to verify the IPB ampacity ratings. The results of this activity did not reveal any findings or situations where the most significant limiting element would need to be revised.	06/30/2017	05/03/2017		No
3 - AEP management sign off before work or project begins for any affected processes that have NERC impact	Establish a Preventative Control to ensure any changes to equipment obtain director level review and sign-off from all applicable engineering disciplines prior to the initiation of a project or work. This is to ensure that the equipment and documentation is in alignment with NERC requirements and methodologies.  The FAC-008 one-lines and Most Limiting Series Element (MLSE) are	09/29/2017	06/01/2017		No

Milestone Activity	Description	*Proposed Completion Date (Shall not be greater than 3 months apart)	Actual Completion Date	Entity Comment on Milestone Completion	Extension Request Pending
	reviewed on a case by case basis when there is a change to the equipment to properly consider identifying and reporting the MLSE.				

Additional Relevant Information

A January 2017 Engineering review of generators due an asset sale prompted a source data review of generation elements. During this review, additional information was found to specify ratings for associated ISO phase bus and thus a further review of the generation facility Most Limiting Series Element (MLSE) ratings was warranted in accordance to FAC-008 methodology. Engineering discovered that ISO bus equipment ratings from Engineering correspondence did not match vendor drawings at Lawrenceburg 1, Lawrenceburg 2, and Waterford 1 Gas Turbine's (GT's). As a result, the GT ISO phase bus rating was incorrect for Lawrenceburg GT1 and GT2, Lawrenceburg GT1 and GT2, and Waterford GT1, GT2, GT3. Revision to the one lines for Waterford and Lawrenceburg were needed to accurately reflect the revised rating of ISO phase bus and as a result become the MLSE for these combined cycle GT MVA ratings during the summer and winter at Lawrenceburg 1 and 2, and the summer for Waterford 1.

The generation FAC-008 methodology, as written, was followed by generation and considered all the elements of the standard. Incorrect equipment specification and resulting incorrect equipment rating resulted in an incorrect MLSE being identified on the Lawrenceburg and Waterford CC units.

The Waterford and Lawrenceburg sites in this self-report were acquired by AEP from previous owners in 2005 and 2007, respectively. The element in question, Combustion Turbine Generator ISO bus, was not engineered or constructed by AEP and had been built to alternate equipment specifications compared to the rest of AEP's engineered and constructed generation Facilities. The transfer of facility design data/drawings from the previous owner was inefficient, limiting engineering's ability to obtain accurate equipment ratings. The MLSE Ratings at the time were established consistent with AEP's methodology for other generator units in its fleet utilizing information available at that time. The specific equipment drawings weren't evaluated or identified until a pre-sale equipment review was performed. This review showed the ISO Bus had been specified and constructed differently than was typical for the rest of AEP's Generation fleet. The Steam Turbine Generators associated with each of the three Combined Cycle units have larger MVA ratings than the Gas Turbine Generators.

In the future, AEP plans to address inconsistencies and gaps in the evaluation of generator equipment and ratings by adding a multi-director signoff process to ensure the proper Facility Rating is associated with the equipment placed in service.

Reliability Risk

## Reliability Risk

While the Mitigation Plan is being implemented, the reliability of the bulk Power System may remain at higher Risk or be otherwise negatively impacted until the plan is successfully completed. To the extent they are known or anticipated : (i) Identify any such risks or impacts, and; (ii) discuss any actions planned or proposed to address these risks or impacts.

The actual impact to the BES was reviewed and operational data shows that generation was not impacted by powerflows through ISO phase bus. The impact to BES was minimal.

The potential impact to the BES would have been a potential trip of the generator if powerflows were exceeded and overloaded through ISO phase bus over an extended period of time. Forced generator outages are planned and reserves in place to maintain grid if unplanned generator outage occur. The impact to BES would be minimal.

## Prevention

Describe how successful completion of this plan will prevent or minimize the probability further violations of the same or similar reliability standards requirements will occur

The FAC-008 one-lines and MLSE are reviewed on a case by case basis when there is a change to the equipment covered so that a change is properly considered in identifying and reporting the MLSE. A Preventative control is in place for change management of equipment that would allow multi director sign off from the various disciplines within AEP Generation Engineering and Projects department to capture any NERC related reviews required prior to the initiation of projects. A review of proposed changes would be completed and require director approval prior to commencing project or work.

Describe any action that may be taken or planned beyond that listed in the mitigation plan, to prevent or minimize the probability of incurring further violations of the same or similar standards requirements

Authorization

An authorized individual must sign and date the signature page. By doing so, this individual, on behalf of your organization:

- \* Submits the Mitigation Plan, as presented, to the regional entity for acceptance and approval by NERC, and
- \* if applicable, certifies that the Mitigation Plan, as presented, was completed as specified.

Acknowledges:

1. I am qualified to sign this mitigation plan on behalf of my organization.
2. I have read and understand the obligations to comply with the mitigation plan requirements and ERO remedial action directives as well as ERO documents, including but not limited to, the NERC rules of procedure and the application NERC CMEP.
3. I have read and am familiar with the contents of the foregoing Mitigation Plan.

AEP Generation Resources Inc. Agrees to be bound by, and comply with, this Mitigation Plan, including the timetable completion date, as accepted by the Regional Entity, NERC, and if required, the applicable governmental authority.

Authorized Individual Signature: \_\_\_\_\_  
(Electronic signature was received by the Regional Office via CDMS. For Electronic Signature Policy see CMEP.)

Authorized Individual

Name: David A. McCammon

Title: Director Plant Engineering & Compliance Program

Authorized On: March 12, 2018

### Certification of Mitigation Plan Completion

Submittal of a Certification of Mitigation Plan Completion shall include data or information sufficient for the Regional Entity to verify completion of the Mitigation Plan. The Regional Entity may request additional data or information and conduct follow-up assessments, on-site or other Spot Checking, or Compliance Audits as it deems necessary to verify that all required actions in the Mitigation Plan have been completed and the Registered Entity is in compliance with the subject Reliability Standard. (CMEP Section 6.6)

Registered Entity Name: AEP Generation Resources Inc.

NERC Registry ID: NCR11401

NERC Violation ID(s): RFC2018019116

Mitigated Standard Requirement(s): FAC-008-3 R6.

Scheduled Completion as per Accepted Mitigation Plan: September 29, 2017

Date Mitigation Plan completed: June 01, 2017

RF Notified of Completion on Date: May 01, 2018

Entity Comment:

Additional Documents			
From	Document Name	Description	Size in Bytes
Entity	MP-315 _Completion_Certification Package--AEP signed.pdf		1,282,020

I certify that the Mitigation Plan for the above named violation(s) has been completed on the date shown above and that all submitted information is complete and correct to the best of my knowledge.

Name: David A. McCammon

Title: Director Plant Engineering & Compliance Program

Email: damccammon@aep.com

Phone: 1 (614) 716-2580

Authorized Signature \_\_\_\_\_ Date \_\_\_\_\_

(Electronic signature was received by the Regional Office via CDMS. For Electronic Signature Policy see CMEP.)



## Mitigation Plan Verification for RFC2018019116

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AEP Generation Resources, Inc. (“AEPGR”)

**Standard/Requirement:** FAC-008-3 R6

**NERC Mitigation Plan ID:** RFCMIT013646-1

**Method of Disposition:** Not yet determined

Relevant Dates					
Initiating Document	Mitigation Plan Submittal	RF Acceptance	NERC Approval	Certification Submittal	Date of Completion
Self-Report 01/26/18	05/01/18	05/07/18	05/22/18	05/01/18	06/01/17

### Description of Issue

[Mitigation Task RFC2018019116](#)

Evidence Reviewed		
File Name	Description of Evidence	Standard/Req.
File 1	MP-315 Completion Certification Package AEP Signed	FAC-008-3 R6
File 2	MP-315 Completion Certification Package AEP Signed Submission 2	FAC-008-3 R6
File 3	AE-99027 Waterford Generation Limiting Element Data 2010 RFC2018019116	FAC-008-3 R6
File 4	AE-99026 Lawrenceburg Generation Limiting Element Data 2010 RFC2018019116	FAC-008-3 R6
File 5	AE-99025 FAC-008 Limiting Element Waterford revised Feb2017 RFC2018019116	FAC-008-3 R6
File 6	AE-99024 FAC-008 Limiting Element Lawrenceburg revised Feb2017 RFC2018019116	FAC-008-3 R6



Evidence Reviewed		
File Name	Description of Evidence	Standard/Req.
File 7	AE-98993 Extent of Condition FAC008 2017 RFC2018019116	FAC-008-3 R6
File 8	RF FAC008 Mitigation RFC2018019116	FAC-008-3 R6

### Verification of Mitigation Plan Completion

**Milestone 1:** Verify OEM equipment specifications of effected equipment to compare to AEP data documentation.

Proposed Completion Date: March 31, 2017

Actual Completion Date: January 27, 2017

File 2, “MP-315 Completion Certification Package--AEP signed - Submission 2” includes the following evidence:

1. Page 4, AE-99024 FAC-008 Limiting Element - Lawrenceburg revised Feb2017 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Lawrenceburg 1 dated January 27, 2017. The screenshot illustrates the generator conductors, summer ratings, and limiting elements which include ST1, GT1 ISO Bus, and GT2 ISO Bus.
  - a. Page 5 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Lawrenceburg 1 dated January 27, 2017. The screenshot illustrates the generator conductors, winter ratings, and limiting elements which include ST1, GT1 ISO Bus, and GT2 ISO Bus.
  - b. Page 6 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Lawrenceburg 2 dated January 27, 2017. The screenshot illustrates the generator conductors, summer ratings, and limiting elements which include ST1, GT1 ISO Bus, and GT2 ISO Bus.
  - c. Page 7 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Lawrenceburg 2 dated January 27, 2017. The screenshot illustrates the generator conductors, winter ratings, and limiting elements which include ST1, GT1 ISO Bus, and GT2 ISO Bus.
  
2. Page 8, AE-99025 FAC-008 Limiting Element - Waterford revised Feb2017 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Waterford CTG1 dated January 27, 2017. The screenshot illustrates the generator conductors, summer ratings, and limiting elements which include the ISO Bus.
  - a. Page 9 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Waterford CTG1 dated January 27, 2017.



- The screenshot illustrates the generator conductors, winter ratings, and limiting element which include the GSU.
- b. Page 10 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Waterford CTG2 dated January 27, 2017. The screenshot illustrates the generator conductors, summer ratings, and limiting element which include the ISO Bus.
  - c. Page 11 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Waterford CTG2 dated January 27, 2017. The screenshot illustrates the generator conductors, winter ratings, and limiting element which include the GSU.
  - d. Page 12 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Waterford CTG3 dated January 27, 2017. The screenshot illustrates the generator conductors, summer ratings, and limiting element which includes the ISO Bus.
  - e. Page 13 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Waterford CTG3 dated January 27, 2017. The screenshot illustrates the generator conductors, winter ratings, and limiting element which includes the GSU.
  - f. Page 14 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Waterford STG dated January 27, 2017. The screenshot illustrates the generator conductors, summer ratings, and limiting element which includes the Generator.
  - g. Page 15 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Waterford STG dated January 27, 2017. The screenshot illustrates the generator conductors, winter ratings, and limiting element which includes the generator.
3. Page 16, AE-99026 Lawrenceburg Generation Limiting Element Data 2010 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Lawrenceburg 1 dated April 30, 2010. The screenshot illustrates the generator conductors, summer ratings, and limiting element which includes the generators.
- a. Page 17, consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Lawrenceburg 1 dated April 30, 2010. The screenshot illustrates the generator conductors, winter ratings, and limiting element which includes the generators.
  - b. Page 18, consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Lawrenceburg 2 dated April 30, 2010. The screenshot illustrates the generator conductors, summer ratings, and limiting elements which include the generators.
  - c. Page 19 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Lawrenceburg 2 dated April 30, 2010. The screenshot illustrates the generator conductors, winter ratings, and limiting



- elements which include the generators.
- d. Page 20 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Lawrenceburg 1 dated April 30, 2010. The screenshot illustrates the generator conductors, winter ratings, and limiting element which includes the generators.
  - e. Page 21 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Lawrenceburg 2 dated April 30, 2010. The screenshot illustrates the generator conductors, winter ratings, and limiting element which includes the generators.
4. Page 22, AE-99027 Waterford Generation Limiting Element Data 2010 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Waterford CTG1 dated April 30, 2010. The screenshot illustrates the generator conductors, summer ratings, and limiting element which include the generator.
- a. Page 23 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Waterford CTG1 dated April 30, 2010. The screenshot illustrates the generator conductors, ratings, and limiting element which include the generator.
  - b. Page 24 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Waterford CTG2 dated April 30, 2010. The screenshot illustrates the generator conductors, summer ratings, and limiting element which include the generator.
  - c. Page 25 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Waterford CTG2 dated April 30, 2010. The screenshot illustrates the generator conductors, ratings, and limiting element which includes the generator.
  - d. Page 26 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Waterford CTG3 dated April 30, 2010. The screenshot illustrates the generator conductors, summer ratings, and limiting element which includes the generator.
  - e. Page 27 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Waterford CTG3 dated April 30, 2010. The screenshot illustrates the generator conductors, ratings, and limiting element which includes the Generator.
  - f. Page 28 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Waterford STG dated April 30, 2010. The screenshot illustrates the generator conductors, summer ratings, and limiting element which includes the generator.
  - g. Page 28 consists of a screenshot of the American Electric Power, Generator & Interconnection Facility Ratings, for Waterford STG dated April 30, 2010. The screenshot illustrates the generator conductors, ratings, and limiting element



which includes the generator.

Milestone # 1 Completion verified.

**Milestone 2:** Comprehensive review of Isolated phase bus ratings for AEP generation fleet.

Proposed Completion Date: June 30, 2017

Actual Completion Date: May 3, 2017

File 2, “*MP-315 Completion Certification Package--AEP signed - Submission 2*”, includes the following evidence:

1. Page 31, AE-98993 Extent of Condition FAC008 2017 consists of an internal email dated May 3, 2017, related to the review of isolated phase bus (IPB) ratings for all AEP east and west generating units which determined that there was no any situations where the most significant limiting element would need to be revised.

Milestone # 2 Completion verified.

**Milestone 3:** AEP management sign off before work or project begins for any affected processes that have NERC impact.

Proposed Completion Date: September 29, 2017

Actual Completion Date: June 1, 2017

File 2, “*MP-315 Completion Certification Package--AEP signed - Submission 2*” includes the following evidence:

Pages 33 through 44, AE-98998 E-OI-710 - Exhibit 2 - Multi-Director Project Initiation Form and Project Work Plan consists of the Engineering Services Multi-Director Project Initiation Form. The form addresses the following areas:

- Project Information
- Staffing Disposition
- Stakeholders and Project Initiation approvals



- Project Summary/Scope
- Engineering and Design Requirements and Assumptions
- Project Costs
- Project Team
- Communication Plan
- Deliverables
- Execution Strategy
- Schedule
- Work Plan Approval.

Milestone # 3 Completion verified.

The Mitigation Plan is hereby verified complete.

A handwritten signature in black ink, appearing to read 'Anthony Jablonski'.

Date: August 27, 2018

Anthony Jablonski  
Manager, Risk Analysis & Mitigation  
ReliabilityFirst Corporation