NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

January 30, 2025

VIA ELECTRONIC FILING

Ms. Debbie-Anne A. Reese
Secretary
Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

Re: **NERC Full Notice of Penalty regarding American Electric Power Service Corp., FERC Docket No. NP25-_-000**

Dear Ms. Reese:

The North American Electric Reliability Corporation (NERC) hereby provides this Notice of Penalty[1] regarding American Electric Power Service Corporation as agent for several entities (collectively, AEP),[2] and referred to herein as the Entity, NERC Registry ID# NCR00682,[3] 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)).[4]

NERC is filing this Notice of Penalty, with information and details regarding the nature and resolution of the violation,[5] with the Commission because ReliabilityFirst Corporation (ReliabilityFirst) and the Entity have entered into a Settlement Agreement to resolve all outstanding issues arising from ReliabilityFirst's determination and findings of the violation of the O&P Reliability Standards listed below.

---

[1] *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).*

[2] 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 and AEP Kentucky Transmission Company, Inc.

[3] The Entity was included on the NERC Compliance Registry as a DP, GO, GOP, RP, TO, and TOP on May 30, 2007, and a TP on June 20, 2018.

[4] *See* 18 C.F.R § 39.7(c)(2) and 18 C.F.R § 39.7(d).

[5] 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.

According to the Settlement Agreement, the Entity neither admits nor denies the violation, but has agreed to the assessed penalty of three hundred eighty thousand dollars ($380,000), 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.

Statement of Findings Underlying the Violations

This Notice of Penalty incorporates the findings and justifications set forth in the Settlement Agreement, by and between ReliabilityFirst 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 (2024), 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.

Violation(s) Determined and Discovery Method
*SR = Self-Report / SC = Self-Certification / CA = Compliance Audit / SPC = Spot Check / CI = Compliance Investigation

NERC Violation ID	Standard	Req.	VRF/VSL	Applicable Function(s)	Discovery Method* & Date	Violation Start-End Date	Risk	Penalty Amount
2021-00215	PRC-023-4	R1	High/ Severe	TO	SR; 6/8/21	12/27/19 to 2/16/21	Serious	$380k

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 the Electric Reliability Council of Texas (ERCOT).

Executive Summary

The Settlement Agreement resolves one violation of the NERC Protection and Control (PRC) Reliability Standards, specifically PRC-023-4 R1.[6] This violation involves the Entity's failure to properly set the relay trip limit in accordance with criteria 1 for one Bulk Electric System (BES) relay on a 500 kV circuit. Although criteria 1 requires that the entity "set transmission line relays so they do not operate at or below 150% of the highest seasonal Facility Rating of a circuit," AEP's settings were below the threshold.

PRC-023-4 R1 (2021-00215)

ReliabilityFirst determined that the Entity failed to ensure that one BES relay on a 500 kV circuit had the relay trip limit set above 150% of the highest seasonal Facility Rating of a circuit per criteria 1. As a result, during a storm and period of high load, the relay tripped and caused a misoperation. The line was out of service for nearly six hours. Attachment A includes additional facts regarding the violation.

The cause of this violation was an employee's failure to select the correct file with updated relay settings when placing the relays into service. A contributing cause that allowed the noncompliance to persist was a lack of internal controls in the settings validation process after putting the relay settings in service.

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

The Entity submitted its mitigation activities to address the referenced violation. Attachment A includes a description of the mitigation activities the Entity took to address this violation.

The Entity certified that it had completed all mitigation activities. ReliabilityFirst verified that the Entity had completed all mitigation activities. Attachment A provides specific information on ReliabilityFirst's verification of the Entity's completion of the activities.

[6] In addition, ReliabilityFirst determined that the self-reported issue also implicates a noncompliance with FAC-008-3 R6 because the Entity had information in its ratings database for the same relay which did not match the settings in the field. The secondary FAC-008-3 noncompliance is being resolved in a separate Find, Fix, Track and Report ("FFT") noncompliance under NERC Violation ID 2022-00622.

Regional Entity's Basis for Penalty

According to the Settlement Agreement, ReliabilityFirst has assessed a penalty of three hundred eighty thousand dollars ($380,000) for the referenced violation. In reaching this determination, ReliabilityFirst considered the following factors, as discussed in more detail in Attachment A:

1. The violation posed a serious and substantial risk to the reliability of the BPS;
2. ReliabilityFirst determined the compliance history should not serve as an aggravating factor;[7]
3. The Entity self-reported the violation;
4. The Entity was cooperative throughout the compliance enforcement process; and
5. There were no other mitigating or aggravating factors or extenuating circumstances that would affect the assessed penalty/disposition method.

After consideration of the above factors, ReliabilityFirst determined that, in this instance, the penalty amount of three hundred eighty thousand dollars ($380,000) is appropriate and bears a reasonable relation to the seriousness and duration of the violation.

Statement Describing the Assessed Penalty, Sanction, or Enforcement Action Imposed[8]

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,[9] NERC Enforcement staff reviewed the applicable requirements of the violation at issue, and considered the factors listed above.

For the foregoing reasons, NERC Enforcement staff approved the resolution between ReliabilityFirst and the Entity and believes that the assessed penalty of three hundred eighty thousand dollars ($380,000) is appropriate for the violation and circumstances at issue, and is consistent with NERC's goal to promote and ensure reliability of the BPS.

[7] The Entity's relevant prior noncompliance with PRC-023 (R1) includes: NERC Violation ID RFC2018018935.

[8] *See* 18 C.F.R. § 39.7(d)(4).

[9] *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).*

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 ReliabilityFirst and the Entity executed November 26, 2024, included as Attachment A;
2. The Entity's Self Report dated June 8, 2021, included as Attachment B; and
3. ReliabilityFirst's Verification of mitigation activities dated April 11, 2022, included as Attachment 1 to Attachment A.

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

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. RELIABILITYFIRST CORPORATION 3 Summit Park Drive, Suite 600 Cleveland, OH 44131 Niki Schaefer Vice President & General Counsel niki.schaefer@rfirst.org (216) 503-0611 Kristen M. Senk* Deputy General Counsel & Director, Legal & Enforcement kristen.senk@rfirst.org (216) 503-0669 Thomas L. Scanlon* Senior Managing Enforcement Counsel tom.scanlon@rfirst.org (216) 503-0658 Elizabeth Emanuel Arora* Counsel elizabeth.emanuel@rfirst.org (216) 503-0604 American Electric Power Service Corp. 1 Riverside Plaza Columbus, OH 43215	Teresina Stasko* Assistant General Counsel and Director of Enforcement North American Electric Reliability Corporation 1401 H Street NW, Suite 410 Washington, DC 20005 (202) 400-3000 (202) 644-8099 – facsimile teresina.stasko@nerc.net James McGrane* Senior Counsel North American Electric Reliability Corporation 1401 H Street NW, Suite 410 Washington, DC 20005 (202) 400-3000 (202) 644-8099 – facsimile james.mcgrane@nerc.net Caelyn Palmer* Counsel North American Electric Reliability Corporation 1401 H Street NW, Suite 410 Washington, DC 20005 (202) 400-3000 (202) 644-8099 – facsimile caelyn.palmer@nerc.net

Zachary McCullough* Vice President, NERC Compliance zwmccullough@aep.com (614) 716-2089 Mark Diggs* Director, NERC Compliance Management mrdiggs@aep.com (614) 716-6126 Jessica Cano* Assistant General Counsel jacano@aep.com (614) 716-2921 LeShel Hutchings* NERC Compliance Manager lmhutchings@aep.com (614) 716-1951 Beth Smail* ENRA NERC Specialist Principal basmail@aep.com (614) 716-2377	

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
Counsel
North American Electric Reliability Corporation
1401 H Street NW, Suite 410
Washington, DC 20005
(202) 400-3000
(202) 644-8099 - facsimile
james.mcgrane@nerc.net
caelyn.palmer@nerc.net

cc: American Electric Power Service Corp.
ReliabilityFirst Corporation

Attachments

Attachment A
Settlement Agreement by and between
ReliabilityFirst and the Entity
dated November 26, 2024

In re: **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 AND AEP KENTUCKY TRANSMISSION COMPANY, INC.**	)	**Unique ID No.:**
NERC Registry ID No. NCR00682	)	2021-00215 (PRC-023-4 R1)

SETTLEMENT AGREEMENT
BETWEEN
RELIABILITYFIRST CORPORATION
AND
AMERICAN ELECTRIC POWER SERVICE CORPORATION

I. EXECUTIVE SUMMARY

1. ReliabilityFirst Corporation ("ReliabilityFirst") 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 and AEP Kentucky

Transmission Company, Inc. ("AEP")[1] (collectively, the "Parties") enter into this Settlement Agreement ("Agreement") to resolve a violation by AEP of PRC-023-4 R1.[2]

2. The Parties stipulate to the facts in this Agreement for the sole purpose of resolving the violation. AEP neither admits nor denies that these facts constitute a violation of PRC-023-4 R1.

3. This Agreement resolves one violation of PRC-023-4 R1. This violation involves the entity's failure to properly set the relay trip limit in accordance with criteria 1 for one Bulk Electric System (BES) relay on a 500 kV circuit. Although criteria 1 requires that the entity "set transmission line relays so they do not operate at or below 150% of the highest seasonal Facility Rating of a circuit," AEP's settings were below the threshold, and during a storm and period of high load, the relay tripped and caused a misoperation. As discussed in more detail below, ReliabilityFirst is imposing a monetary penalty of $380,000.00 for this violation.

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. AEP is registered on the NERC Compliance Registry as a Distribution Provider ("DP"), 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 DP, GO, and TO, is subject to compliance with PRC-023-4 R1.

III. VIOLATION

A. PRC-023-4 R1 (2021-00215)

6. PRC-023 ensures that protective relay settings do not limit transmission loadability

[1] AEP is an MRRE and participates in the Coordinated Oversight program. ReliabilityFirst is the Lead Regional Entity and Midwest Reliability Organization and Texas Reliability Entity, Inc. are the Affected Regional Entities (AREs). Although this is not a multi-regional issue, ReliabilityFirst provided notice to the AREs of the disposition of this issue.

[2] This Agreement references the version of the Reliability Standard in effect at the time each violation began.

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.

7. 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.

8. PRC-023-4 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).
>
> ***

Description of Violation and Risk Assessment

9. On June 8, 2021, the entity submitted a Self-Report to ReliabilityFirst stating that, as a TO, it had identified a potential noncompliance with PRC-023-4 R1.

10. This noncompliance involves one BES relay on a 500 kV circuit in which the relay trip limit was not set above 150% of the highest seasonal Facility Rating of a circuit per criteria 1, which tripped and caused a misoperation.

11. On September 6, 2019, the entity completed its workbook of populated relay settings for the impacted relay and communicated the relay setting trip ratings to the entity's responsible transmission planning personnel to include in the facility's element list; the relay settings went into service on December 27, 2019. The entity was unaware that an engineering template default setting was left enabled on the impacted relay. The enabled setting was the phase time overcurrent (TOC), a load responsive setting that was set below load, which limited the loadability of the line.

On February 16, 2021, during a storm and period of high load, the impacted relay tripped and caused a misoperation on the Nagel-Phipps Bend 500 kV circuit.[3] As a result of the misoperation, the entity discovered the noncompliance and corrected it the same day.

12. Following the outage from the relay tripping on the Nagel-Phipps Bend 500 kV circuit at 6:58 am EPT on February 16, 2021, PJM issued two Post Contingency Local Load Relief Warnings: the first was issued at 7:07 am EPT to maintain a post-contingency flow below 210 MVA on the Bradford-Keywood 138 kV area, and was cancelled by PJM at 1:58 pm EPT; the second was issued at 7:30 am EPT to maintain a post-contingency flow below 208 MVA on the Fort Robinson-Wolf Hills 138 kV area, and was cancelled by PJM at 9:16 am EPT.

13. For reference, the intended ratings communicated to the transmission planning personnel for Summer Normal and Emergency Ratings were 3,609 MVA, but the actual ratings based on the errant relay settings issued in the field by the engineer were 396 MVA for both. Similarly, the intended ratings communicated to the transmission planning personnel for Winter Normal and Emergency Ratings were 4,473 MVA, but the actual ratings based on the errant relay settings issued in the field by the engineer were 396 MVA for both. The impacted relay was a directional relay monitoring Nagel to Phipps Bend. The Nagel-Phipps Bend 500 kV circuit typically had power flowing from Phipps Bend to Nagel and rarely had power flowing from Nagel to Phipps Bend. In fact, for the duration of the noncompliance, the only time power flowed from Nagel to Phipps Bend above the incorrect trip limit was on the day of the tripping event. This explains why the incorrect settings did not cause an issue earlier. ReliabilityFirst notes that the line at issue was not part of an Interconnection Reliability Operating Limit. The entity performed an extent of condition, and no other PRC-023 noncompliances were discovered.

14. The root cause of this noncompliance was the engineer placing the wrong settings into service by inadvertently selecting the file without updated settings instead of the revised settings file. Specifically, the software used to set relays caused confusion by creating a new settings folder any time a setting was changed. The working folder contained the original settings, and the newly created folder contained the settings with changes by the entity. This resulted in two settings folders for the relay (the entity addressed this issue in milestone 2 of its Mitigating Activities). Here, the engineer selected the file with an engineering template default setting (i.e., no saved changes from the engineer) instead of the engineer's revised changes. A contributing cause that allowed the noncompliance to persist was a lack of internal controls as it relates to AEP's settings' validation process after putting the relay settings in service. Although the entity has peer reviews before the settings are placed in service and the correct settings were reviewed, the mistake came after those reviews when the engineer who issued the settings mistakenly selected the wrong, original settings file.

[3] The line was out for 5 hours and 49 minutes.

15. This noncompliance started on December 27, 2019, the date the relay went into service with the incorrect settings, and ended on February 16, 2021, when the relay tripped and a misoperation occurred, and the entity corrected the relay settings to bring it into compliance with PRC-023-4 R1 the same day.

16. This violation posed a serious and substantial risk to the reliability of the bulk power system.[4] Improperly setting relays for transmission system components can prematurely trip these components out of service, limiting system operator flexibility and their ability to take controlled actions. Here, the risk is elevated because of the more than one year duration involving a 500 kV circuit, and the worst-case scenario (a tripped relay that caused a misoperation) actually occurred during a storm and period of high load. Further, the significance of the settings deficiency (396 MVA compared to the intended Summer 3,609 MVA and Winter 4473 MVA), coupled with the entity's lack of effective internal preventative and detective controls (the entity did not know the TOC setting was incorrectly enabled on the relay until the misoperation occurred), escalated the risk.

Mitigating Actions

17. On November 18, 2021, the entity submitted Mitigating Activities to ReliabilityFirst to address the noncompliance with PRC-023-4 R1. For its mitigation, the entity committed to take the following actions by September 30, 2021: First, the entity corrected the relay settings the same day of the misoperation. Second, the entity worked with the vendor to update the settings software so that the revised settings files are not saved in separate folders; the update and communication to AEP Transmission Protection & Control Engineering of the change occurred on April 21, 2021. Third, the entity developed a corrective action plan per PRC-004 obligations and reviewed all relays with the "Phase TOC" or "Phase INST" settings enabled with default template settings. Fourth, the entity rolled out the automated relay settings tool which calculates relay settings with automatically populated relay settings templates to minimize human errors; the tool includes the latest methods and best practices for relay settings agreed upon and regularly updated by the entity's Transmission Protection & Control Engineering Technical Leaders Group, and users were trained on an individual basis. Fifth, the entity reviewed similar protective relay settings to check for other instances in which the phase TOC was incorrectly enabled; specifically, the entity scanned for "Phase TOC" and "Phase INST" settings in network connected intelligent electronic device relays and looked at whether the template default settings were set and if the elements were enabled. No other PRC-023 noncompliances were discovered, however, there were some relays on sub-200 kV circuits with incorrect settings that were corrected, examined for facility rating implications, and separately self-reported.

18. On February 21, 2022, the entity certified to ReliabilityFirst that it completed these

[4] PRC-023-4 R1 has a VRF of "High" pursuant to the VRF Matrix. According to the VSL Matrix, this issue warranted a "Severe" VSL.

Mitigating Activities as of September 23, 2021. On April 11, 2022, ReliabilityFirst verified that the entity completed these Mitigating Activities on September 23, 2021. See Mitigating Activities Verification for 2021-00215, **Attachment 1**.

IV. ADJUSTMENT FACTORS

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

Self-Report

20. Effective oversight of the reliability of the BES depends on robust and timely self-reporting by Registered Entities. AEP self-reported the violation at issue in this Agreement, and ReliabilityFirst seeks to encourage this type of self-reporting by reducing the monetary penalty for this violation.

Cooperation

21. AEP has been cooperative throughout the entire enforcement process. Throughout the enforcement process, AEP voluntarily provided ReliabilityFirst with relevant information regarding the violation in a manner that was detailed, well organized and timely. AEP has been transparent with ReliabilityFirst regarding the violation and AEP's processes and systems, and this insight has allowed ReliabilityFirst to better analyze the violation and assist AEP with resolving the same. ReliabilityFirst awarded mitigating credit for this level of cooperation to encourage this sort of response by other Registered Entities in the future. The entity also quickly remediated the noncompliance upon discovery.

Compliance History

22. When assessing the penalty for the violations at issue in this Agreement, ReliabilityFirst considered whether the facts of these violations constitute repetitive infractions. AEP has relevant prior noncompliances with PRC-023-4 R1; however, those prior noncompliances arose from differing circumstances and root causes. Therefore, ReliabilityFirst did not aggravate the seriousness of the violation or impose an additional penalty.

V. PENALTY

23. Based upon the foregoing, AEP shall pay a monetary penalty of $380,000.00 to ReliabilityFirst.

24. 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. AEP shall remit payment to ReliabilityFirst by wire transfer or Automated Clearing House. ReliabilityFirst will notify NERC if it does not timely receive the payment from AEP.

25. 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 31st day after the date on the invoice issued by ReliabilityFirst to AEP for the monetary penalty payment or (b) the 51st day after the Agreement is approved by the Commission or operation of law.

VI. ADDITIONAL TERMS

26. 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.

27. 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.

28. 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.

29. 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.

30. 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.

31. 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.

32. Upon execution of this Agreement, the Parties stipulate that the violation resolved through this Agreement will be considered a violation. The parties further stipulate that all required, applicable information listed in Section 5.3 of the CMEP is included within this Agreement.

33. 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.

34. 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.

35. The Agreement may be signed in counterparts.

36. This Agreement is executed in duplicate, each of which so executed shall be deemed to be an original.

[SIGNATURE PAGE TO FOLLOW][5]

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

[5] An electronic version of this executed document shall have the same force and effect as the original.

ENDORSED BY:

/s/ Niki Schaefer — November 19, 2024
Niki Schaefer — Date
Vice President & General Counsel
ReliabilityFirst Corporation

AGREED TO AND ACCEPTED BY:

American Electric Power

_____ — _____
Zachary W. McCullough — Date
Vice President, NERC Compliance
American Electric Power

_____ — _____
Robert W. Bradish — Date
Senior Vice President, Regulated
Infrastructure Investment Planning
American Electric Power

ReliabilityFirst Corporation

/s/ Timothy R. Gallagher — November 19, 2024
Timothy R. Gallagher — Date
President & Chief Executive Officer
ReliabilityFirst Corporation

ENDORSED BY:

Niki Schaefer
Vice President & General Counsel
ReliabilityFirst Corporation

Date

AGREED TO AND ACCEPTED BY:

American Electric Power

DocuSigned by:
EA7E21EDE93C49A...

11/26/2024 | 1:26 PM EST

Zachary W. McCullough
Vice President, NERC Compliance
American Electric Power

Date

Signed by:
Robert Bradish
CE4ED3037D3440A...

11/26/2024 | 3:03 PM EST

Robert W. Bradish
Senior Vice President, Regulated
Infrastructure Investment Planning
American Electric Power

Date

ReliabilityFirst Corporation

Timothy R. Gallagher
President & Chief Executive Officer
ReliabilityFirst Corporation

Date

Mitigating Activities Verification for 2021-00215

American Electric Power Service Corporation

Standard/Requirement: PRC-023-4 R1.

NERC Registry ID: NCR00682

Date of Completion of Mitigation: September 23, 2021

Description of Issue: CF2021-00215

Evidence Reviewed	
File Name	**Description of Evidence**
File 1	AEP MP-509 Certification Package.pdf
File 2	EV-19869 Update GE Enervista Software.pdf
File 3	EV-19870 Updated relay settings 2-16-2021.pdf
File 4	EV-2078 Nagel 321H2H Compare.xlsm
File 5	RFI for 2021-00215 AEP Response.docx
File 6	RFI – 2021-00215 Response.docx

Verification of Mitigating Activity Completion

Mitigating Activity 1: 1.0 - Initial Fix on the L90 relay.

Completion Date: 2/16/2021

Mitigating Activity #1: Page 6 of *AEP MP-509_Certification Package.pdf* shows an internal AEP email communication that contains the relay settings change performed on the L90 relay. The change was completed on February 16, 2021. Completion verified.

Mitigating Activity 2: 2.0 - Corrective Control and Communication.

Completion Date: 4/21/2021

Mitigating Activity #2: AEP worked with their vendor to update the software so that the revised setting file is not necessarily saved into a separate folder. Page 7 of *AEP MP-509_Certification Package.pdf* shows communication from the vendor and internal communication at AEP which shows a fix to be used by AEP protection personnel to ensure files are correctly saved to avoid similar issues in the future. The communication is dated April 21, 2021. Completion verified.

Mitigating Activity 3: 3.0 - Corrective Control.

Completion Date: 5/6/2021

Mitigating Activity #3: AEP developed a corrective action plan (CAP) and reviewed all applicable relays that may have had a similar issue as the one that caused the non-compliance. Page 10 of *AEP MP-509_Certification Package.pdf* shows AEP's CAP that was developed to ensure any similar issues were remedied. The CAP Summary states, "GE relay had Phase TOC enabled by accident with template default settings and tripped during heavy load. SEL relay and Matcad calculations both had this element disabled. The main cause of this issue was related to human error and the setter not disabling this element." This CAP has an approval date of May 6, 2021. Completion verified.

Mitigating Activity 4: 4.0 - Implement new settings calculation tool.

Completion Date: 6/30/2021

Mitigating Activity #4: AEP implemented the automated relay settings (ARS) tool to calculate relay settings with automatically populated relay settings templates to minimize human errors. Page 16 of *AEP MP-509_Certification Package.pdf* shows screenshots of the ARS tool. Page 15 of this document shows internal AEP email communication in which the Protection and Control Engineering Manager states that as of June 2020, the ARS tool is fully part of their standard in developing relay settings. Completion verified.

Mitigating Activity 5: 5.0 - Extent of Condition.

Completion Date: 9/23/2021

Mitigating Activity #5: AEP reviewed similar protective relay settings to check for any other instances of the same issue that caused this non-compliance. No other PRC-023 non-compliance issues were discovered; however, some relays on sub-200 kV (not applicable to PRC-023) circuits

with incorrect settings were identified. Page 19 of *AEP MP-509_Certification Package.pdf* shows the 138kV circuits that were identified where settings changes are necessary. Completion verified.

The Mitigating Activities are hereby verified complete.

Date: April 11, 2022

Anthony Jablonski
Senior Manager, Risk Analysis & Mitigation
ReliabilityFirst Corporation

Attachment B
Self Report for PRC-023-4 R1
submitted June 8, 2021

Finding Record - Violation ID: 2021-00215

General information

Compliance Enforcement Authority:	RF
Registration:	NCR00682 - 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 and AEP Kentucky Transmission Company, Inc.
Applicable Requirement:	PRC-023-4 R1.
Applicable Part(s):	
Applicable Reliability Function(s):	TO
Region - Jurisdiction in which the Potential Noncompliance Occurred:	RF-US
Other Region - Jurisdiction(s) where you are reporting this Potential Noncompliance:	
Entity in Coordinated Oversight:	Yes
Associated Registrations Impacted:	
If Finding from Audit, related Audit Finding ID:	
Finding Created by CEA:	No

Discovery and Description

Monitoring Method:	Self-Report
When was the Potential Noncompliance discovered?:	February 16, 2021
When did the Potential Noncompliance start?:	December 27, 2019
Is the Potential Noncompliance still occurring?:	No
When did you return to compliance?:	February 16, 2021
What is the basis for selecting the start date?:	The incident start date of 12-27-2019 was selected because this was the day the relay went into service.
How was the Potential Noncompliance Discovered?:	The potential noncompliance was discovered during a misoperation investigation.
Please describe the Potential Noncompliance in detail:	On February 16, 2021, AEP Transmission Protection & Control Engineering (PCE) discovered the cause of a misoperation, that occurred that same day on the Nagel- Phipps Bend 500 kV circuit, was a GE L90 relay with incorrect settings. The relay tripped during a period of high load. The relay had a phase time overcurrent (TOC) element enabled which limited the loadability of the line. It was not PCE's intent to enable the relay with that setting. It was a manufacturer default setting that inadvertently got uploaded into the template used to issue settings. PCE has peer reviews in place for settings, and the incorrect phase TOC setting was not present in the setting file during the peer review. The mistake happened during the very last step of the process when uploading the file. Subsequent to the peer review, the engineer who issued the settings for this relay inadvertently uploaded an incorrect setting file into IPS for use by AEP Transmission Field Services. This incident occurred from December 27, 2019, the date the relay went into service with the incorrect settings, through February 16, 2021. The settings were issued on September 6, 2019. This was considered as potential noncompliance of PRC-023-4 R1, specifically Criteria 1.

Extent of Condition and Root Cause

Has an Extent of Condition Review been performed?:	No
If yes, what was/is the Extent of Condition?:	
What cause(s) led to the Potential Noncompliance?:	At this time, the cause of this incident has been determined to be a software configuration error and possible deficiency in the settings peer review process.

Risk and Impact

What do you think the Potential Impact to the BPS was/is from this Potential Noncompliance?:	Moderate
Why do you believe that to be the correct Potential Impact?:	The potential risk posed by this instance of potential non-compliance was determined to be moderate due to the potential intermediate impact and moderate likelihood given preventative and detective controls in place.
How likely is it that Impact could have occurred?:	The likelihood of the potential impact occurring was moderate. With the phase time overcurrent (TOC) being incorrectly enabled on the relay, tripping of the relay was likely to occur during a high load period.
Was there any actual impact to the BPS?:	Yes
If yes, what was the Actual Impact to the BPS?	In this scenario, the worst reasonable case occurred and was the reason for discovery of the incident. During a storm and period of high load, the relay tripped and caused a misoperation. One of the other sources was out so all current was flowing through this line and led to the relay tripping. This was due to the phase time overcurrent (TOC) being enabled. The phase TOC is a load responsive setting that needs to be set above load. Though the incorrect settings were used, the issue seems to be isolated, though AEP is checking similar protective relay settings for any additional instances where the phase TOC was inadvertently enabled. AEP also has a peer review in place to look at settings before issuing. Though the relay tripped and caused a misoperation, the settings were corrected the same day. Due to above controls, AEP determines this issue has a moderate likelihood of intermediate potential impact to the BPS. This equates to moderate risk to the BPS.

Additional Comments

Please provide any additional comments	[RFC]AEP: PCI-2930 Description of Mitigating Activities and Preventative Measure: Since the incident was discovered, the settings on the L90 relay were corrected on the same day of the misoperation, February 16, 2021. (EV-19870) Additionally, AEP worked with the vendor to update the software so that the revised setting file is not necessarily saved into a separate folder. The update and communication to PCE of this change occurred on April 21, 2021. (EV-19869) AEP is also in the process of querying similar protective relay settings to check for any other instances of the phase TOC enabled. (Specifically scanning for Phase TOC and Phase INST settings in network connected IED relays and looking for instances where the template default settings are set and the elements are enabled).