

**SOUTHWEST POWER POOL
SYSTEM PROTECTION AND CONTROL ADVISORY GROUP MEETING**

May 14, 2024 1:00PM - 5:00PM (CPT)
May 15, 2024 8:00AM - 11:00PM (CPT)

Teleconference

SUMMARY OF MOTIONS AND ACTION ITEMS

MOTIONS:

- Ken Zellefrow (CUS) motioned to approve the February 13-14, 2024 SPCAG Meeting Minutes. David Oswald (Liberty) seconded the motion. The motion carried without opposition or abstention.
- Steve Wadas (NPPD) motioned for approval of retirement of the eastside RCDC RAS. Spencer Riddle (WAPA) seconded the motion. The motion carried without opposition or abstention.

ACTION ITEMS:

- None

SYSTEM PROTECTION AND CONTROL ADVISORY GROUP MINUTES
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MINUTES

AGENDA ITEM 1 – ADMINISTRATIVE ITEMS

SPCAG Chair Chris Angland (OPPD) called the meeting to order at 1:00 PM on 5/14/2024. The meeting reconvened at 8:01 AM on 5/15/2024.

SPCAG Staff Secretary William Holden (SPP) took attendance and established a meeting quorum. A record of member attendance is an attachment to these minutes.

William Holden (SPP) read the SPP Antitrust Statement.

Chris Angland (OPPD) reviewed the agenda. A record of the agenda is an attachment to these minutes.

Ken Zellefrow (CUS) motioned to approve the *February 13-14, 2024 SPCAG Meeting Minutes*. David Oswald (Liberty) seconded the motion. The motion carried without opposition or abstention.

AGENDA ITEM 2 – REMEDIAL ACTION SCHEMES

THUNDERHEAD

Tom Kay (Invenergy) provided an update on the Thunderhead RAS retirement previously approved. Progress is being made on implementing a fiber communication link between Grand Island and Holt along with design of the protection setting changes required to retire the RAS and implement the operating guide. Coordination is ongoing with NPPD and WAPA to achieve a retirement date prior to November 1st, 2024.

RAPID CITY

Philip Westby (BEPC) provided an overview of the Rapid City RAS, history of changes, analysis performed by Schweitzer, overview of completed discussions with NPPD and WAPA, and requested recommendation for retirement. Retirement recommendations have been provided by both TWG and ORWG. These recommendations along with the SPCAG's will be provided to MOPC for approval followed by the SPP Reliability Coordinator.

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Steve Wadas (NPPD) motioned for approval of retirement of the eastside RCDC RAS. Spencer Riddle (WAPA) seconded the motion. The motion carried without opposition or abstention.

JUDSON TEMPORARY RAS

Philip Westby (BEPC) provided an update that the Judson temporary RAS went into service March 1st, 2024 and has since provided constraint relief. Roundup to Kummer Ridge project construction commenced in April 2024 with completion anticipated by late 2025.

AGENDA ITEM 3 – SPP SYSTEM PLANNING SHORT CIRCUIT MODEL

Eddie Watson (SPP) provided an update on the SPP system short circuit model development effort under [SIR544](#). The initiative requested by the SPCAG is for the MDAG short circuit models to include a separate validated ASPEN model to be used in system protection in addition to PSS/E model currently developed. The initiative was not budgeted for the current financial year and is anticipated to be included in the upcoming budget cycle finalized in July 2024 timeframe. Modeling staff is in the process of identifying a consultant or firm to perform conversion work and/or process development. Initiative may involve a consolidation with another parallel effort. The new annual model will be included in the 2025 model series scheduled for PSS/E portion to be completed in March 2025 with the ASPEN conversion to follow with delivery in approximately Q2 2025. Eddie will work with Eric and William to coordinate on SOW information for bids for training or automation. SPCAG members were asked to review SIR544 and provide feedback.

AGENDA ITEM 4 – IBR

Mostafa Sedighizadeh (SPP) presented on IEEE-2800 standard adoption and the IIRRG progress on the effort. Concerns were expressed regarding OEM feedback on timing needed for developing testing capabilities and SPP's perspective on retroactive application of the standard to existing facilities.

Shannon Mickens (SPP) member of the internal IIRRG, start on legal definitions such as AGIR, shared with IEEE-1547, to identify the applicable entity.

Scott Jordan (SPP) provided an update on SPP adoption of IEEE-1547. During internal and external discussions, regulatory, legal, etc. discovered that the definition of authority governing interconnection requirements (AGIR) as a limitation to implementation. SPP is pursuing a technical adoption of the standard with a detailed reference and is in discussion with EPRI staff

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for developing a document for sharing at a subsequent meeting. The document would provide entities with coordinated settings guidance.

AGENDA ITEM 5 – FERC ORDER 881

William Holden (SPP) provided an update on the SPP implementation of FERC Order 881 and introduced the group to the Protection Relays section of the [SPP Operational Ratings Methodology](#) document drafted for review by the AARITF. Members shared concerns regarding the conditions that would necessitate facility ratings reflecting existing protection system equipment capabilities or when settings may be required to be adjusted. For example, facility ratings may need to be limited to a limit from a current transformer ratio or mechanical relay capability.

AGENDA ITEM 6 – GEOMAGNETIC DISTURBANCE PROGRAM

Chris Colson (WAPA) presented on recent events associated with awareness and defense against Geomagnetically-induced current (GIC) from Geomagnetic disturbances (GMD) from space weather. This past weekend's event was a series of sustained Corona Mass Ejection (CME) which may cause an electrojet inducing magnetic and geoelectric fields. GIC are quasi-DC that can cause half-cycle saturation and harmonics leading to temperature rise in transformers.

Non-invasive Hall-effect current transformers were installed on the neutral of two transformers in South Dakota in the range of \$15-20k each including SCADA interfacing equipment. Additionally, a neutral blocking device (NBD), DOE funded and developed by Emprimus, was inserted between neutral bushing and ground of each transformer. The NBDs are comprised of three parallel legs. The normal current path is through both AC and DC breakers and a small resistor needed for measurement. During GIC events the DC breaker and AC breakers have a coordinated opening which diverts current through the second leg comprised of a resistor and capacitor in series which effectively blocks the quasi-DC current while allowing AC and fault currents to flow. Once both breakers are open, the DC breaker is then reclosed to prepare the AC breaker to be available to quickly reclose if needed. The third leg includes a spark gap to provide a path for overvoltage flashover if needed. The initial NBD pickup value for measured DC currents was implemented at 5 Amps, well below the 75 Amps determined to potentially cause damage for this device, and was based on experience with past events and modeling.

A solar storm event occurred around 8:35 PM CDT on Friday March 22, 2024 with an X1.1 class flare was observed. (X class 8 event was observed over the weekend of May 10-12, 2024.) At 9:36 AM CDT on Sunday March 24, 2024 the NBD on the White transformer observes the GIC and activates several times during the event to block the GIC whenever it exceeded the pickup

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value. TVA also installed NBD under the same DOE pilot program. They also experienced GIC during the March event.

The NERC Standard EOP-010 procedures rely on national-level alerts being monitored by RC being relayed to each Transmission Operator. The Hall-effect current transformers provided in-situ monitoring of GICs allowing WAPA Transmission Operator to alert SPP a full hour ahead of the normal process.

Since installation the record amount of GIC on these transformers was 16-17 Amps over the past 2.5 Years. The event occurring the weekend of May 10-12, 2024, with 9-10 distinct CMEs, surpassed this with a new record of 62 Amps being observed. During this event, WAPA experienced high top oil temperature alarms even on lightly loaded devices (i.e. 15% loading) on devices operated but not owned by WAPA. Telemetry of temperatures was not available, only alarms.

AGENDA ITEM 7 – RELIABILITY GROUPS

NERC SPCWG

Lynn Schroeder (SECI) informed the group of a scheduled review of the draft *Transmission System Phase Backup Protection* document and drew attention to transformer overload and protection. This document is located under Technical Reference Documents on the [RSTC Approved Documents Page](#). Also located on this page under the White Papers section is the *SPCWG Orders 881/881-A Position Paper* and *Draft Steady State Approach for PRC-024-3 Evaluation for Inverter-Based Resources*. This draft, which converses on differences between inverter terminals and POI, is under review and once comments are addressed will go to the RSTC for approval.

On the [Compliance Guidance](#) page under the Implementation Guidance section and Proposed Implementation Guidance subsection is the PRC document titled *PRC-023-6 R1 Determination of Practical Transmission Relaying Loadability Settings v1_1* which is undergoing a revision for some modernization updates particularly on OOS protection and reformatting. This document should be reviewed against implementation of FERC Order 881 and AAR processes. As a NERC Standard guidance document, different than a white paper, this document may be utilized by auditors.

The April 11, 2024 SPCAG meeting also included discussion of the Maintenance for Ethernet P&C technical reference, similar to PRC-005, TPL-001 SAR footnote 13 White Paper, and FERC Order for IBRs and grid transformation prioritization delayed drafting team.

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The purpose of the TPL-001 SAR for footnote 13 is to clarify protection community guidance for single trip coil exception for planning criteria. Trip coil with monitoring can be excluded but not the entire circuit. Pursuit is for a non-delayed method such as an implementation guide. Follow up items with the drafting team includes DC fuses.

Misoperation task force is under development to look into issues that may have been solved by commissioning or other issues. The existing MIDAS group may be dissolved coinciding with this new group taking on the responsibilities for deep dives. Next meeting in July hosted by Hydro Quebec. Each group includes subgroups that don't require membership in the parent group for participation.

Three new IBR focused standards are under development.

NERC STANDARDS

Shannon Mickens (SPP) discussed FERC Order 901 prioritization of NERC Standards regarding the 11 cold weather and virtualization, internal network and security monitoring, IBR performance and disturbance monitoring, extreme weather, and any remaining high priority projects. There were also 14 medium and low priority projects with postings having been deferred to place industry focus on high priority projects. There are now reduced timeframes for comments and feedback which is concerning for wholistic coordination and quality industry comments. Four high level milestones were established for work plan development and implementation. A definition for IBR plant marginally passed ballot whereas definitions for IBR unit and distributed energy resource (DER) remain under development.

MRO PRS MEETING

Lynn Schroeder (SECI) provided an overview of the MRO Q1 2024 Protective Relay Subgroup Meeting that occurred on March 12, 2024. It was recommended not to use high speed drivers for protective relays on solid state contacts. There is a new load loss effort for TADS. OG&E provided an oral report on their misoperations that may be a good topic for the next SPCAG meeting. The Q2 meeting is scheduled for June 11, 2024, the Q3 meeting will occur at the NERC misoperation workshop with a joint meeting between WECC and MRO PRS in September, and the Q4 meeting is scheduled for December 10, 2024.

AGENDA ITEM 8 – PROTECTION IN YOUR SHOP

Matt Wyatt (Liberty) presented on settings development automation internally developed that interfaces Excel with ASPEN and AutoCAD using VBA. An identified pitfall is training new staff on the system. New staff are advised to learn how settings are determined and set prior to

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adoption of automation so ensure that settings are understood. PRC-027 peer reviews include automation though doesn't offer much additional guidance.

Chris Angland (OPPD) requested volunteer(s) for next meeting and will follow-up with OG&E on sharing their misoperation report with this group.

AGENDA ITEM 11 – CLOSING ADMINISTRATIVE DUTIES

William Holden (SPP) reviewed new, open and closure pending action items.

Action Item 157 remained as Closure pending to evaluate NERC whitepaper on short circuit models integration into the MDAG process. Action item 162 remains marked as In Progress with SPP Planning Modeling staff to present requested topics during SPCAG discussion of Short Circuit Models and analysis. Action item 165 remains marked as Closure Pending to allow SIR544 prioritization to be agreeable to the SPCAG. Action item 166 remains marked as In Progress with SPCAG members invited to participate in the MDAG model process. Action item 167 remains marked as In Progress with SIR544 being scoped and budgeted for inclusion in the 2025 Series MDAG models. Action item 169 was marked as In Progress with SPCAG members offering assistance with scoping and budgeting SIR544. Action item 170 remains marked as Closure Pending for SPCAG to receive clarity on Light Load evaluation in the SPP 2024 UFLS Design Assessment Scope. A record of action items is an attachment to these minutes.

The 2024 meeting schedule and locations were discussed.

- August 13-14, 2024 (In-person, Denver)
- November 12-13, 2024 (Teleconference)

Chris Angland (OPPD) recessed the SPCAG at 4:37 PM on 5/14/2024 and adjourned the SPCAG at 12:03 PM on 5/15/2024.

Respectfully Submitted,

William Holden, System Protection and Control Advisory Group, Staff Secretary

**SYSTEM PROTECTION AND CONTROL ADVISORY GROUP MINUTES
5/14-15/2024**

SUMMARY OF ATTACHMENTS:

SPCAG 5/14-15/2024 Agenda (pg. 9)

SPCAG 5/14-15/2024 Member Attendance (pg. 10)

SPCAG Action Item Tracking (pg. 11-13)

SPCAG Approved *February 13-14, 2024 SPCAG Meeting Minutes*

**SOUTHWEST POWER POOL, INC.
SYSTEM PROTECTION AND CONTROL ADVISORY GROUP MEETING**

May 14, 2024 1:00PM - 5:00PM CPT
May 15, 2024 8:00AM - 12:00PM CPT
Evergny Offices, Kansas City, Missouri

AGENDA

1. Administrative Items:
 - a. Call to Order..... Chris Angland
 - b. AttendanceWilliam Holden
 - c. Antitrust Statement.....William Holden
 - d. Agenda Review Chris Angland
 - e. Review minutes of February 13-14, 2024 meeting (Approval) Chris Angland
2. Remedial Action Schemes: [spp.org/Documents/62226/SPP RC PRC-012-2 0820EXT00137.pdf](https://spp.org/Documents/62226/SPP_RC_PRC-012-2_0820EXT00137.pdf)
 - a. Thunderhead RAS Retirement (Update)..... Tom Kay
 - b. Rapid City RAS Retirement (Approval)..... Philip Westby
 - c. Judson Temporary RAS (Update)..... Philip Westby
3. SPP System Planning Short Circuit Model: [SIR544](#) (Update)Eric Sullivan
4. Inverter Based Resources (IBR) (Update):
 - a. IEEE 2800: Summary of gap analysis & Adoption Next Steps.....Mostafa Sedighizadeh
 - b. SPP Adoption of IEEE-1547 Scott Jordan
5. FERC Order 881 (Update)William Holden
6. Geomagnetic Disturbance Program (Event Review) Chris Colson
7. Reliability Groups (Update):
 - a. [NERC SPCWG](#)..... Lynn Schroeder
 - b. [NERC Standards](#).....Shannon Mickens
 - c. [MRO PRS](#).....Glenn Bryson
8. Protection in your shop:
 - a. Settings Development and Automation.....Matt Wyatt
9. Closing Administrative Duties:
 - a. Review of New, Open and Closure Pending Actions.....William Holden
 - b. Discuss upcoming meeting schedule, topics, and location Chris Angland
 - i. August 13-14, 2024 (In-person, Xcel Offices, Denver, Colorado)
 - ii. November 12-13, 2024 (Teleconference)
 - c. Adjourn meeting Chris Angland

SPCAG MEMBER ATTENDANCE:

Name	Company	Role	5/14/2024	5/15/2024
Chris Angland	Omaha Public Power District	Chair	✓	✓
David Oswald	Liberty Utilities	Vice Chair	✓	✓
John Anderson	Eergy, Inc	Member	✓	✓
Matt Boersema Neudahl	Western Farmers Electric Cooperative	Member	✓	✓
Glenn Bryson	American Electric Power	Member	✓	
Michael Fleck	ITC Great Plains	Member	✓	✓
Shawn Jacobs	Oklahoma Gas & Electric	Member	✓	✓
Spencer Riddle	Western Area Power Administration Upper Great Plains Region	Member	✓	✓
Lynn Schroeder	Sunflower Electric Power Corp	Member	✓	✓
Steve Wadas	Nebraska Public Power District	Member	✓	✓
David Wheeler	Xcel Energy	Member	Unavailable	Unavailable
Ken Zellefrow	City Utilities of Springfield MO	Member	✓	✓
William Holden	Southwest Power Pool	Staff Secretary	✓	✓

SPCAG ACTION ITEMS

Action Item	Origin Date	Action Item	Update Summary	Status	Owner	Date Closed
157	02/10/21	SPP Staff to reach out to SPCAG to determine interest in developing PSSE/ASPEN/CAPE Conversion Whitepaper.	<p>5/12/21: Trey to send list to Lynn, and resend the request for participation.</p> <p>8/11/21: There's a current NERC effort to develop a whitepaper, and the SPP action is on hold until that paper is developed.</p> <p>11/10/21: Closure pending review of NERC paper, Q2 2022.</p> <p>5/11/22: Closure pending review of NERC paper, Q2 2022.</p> <p>8/9/22: Closure pending review of NERC paper, Q4 2022.</p> <p>11/9/22: Closure pending discussion of need for additional whitepaper.</p> <p>2/7/23: Closure pending discussion of need for additional whitepaper.</p> <p>4/25/23: Closure pending evaluation of NERC paper incorporation into MDAG process</p> <p>11/8/23: Closure pending MDAG process validations being evaluated and updated to include NERC paper recommendations, Chris Angland will investigate further to achieve closure</p> <p>2/14/24: No progress to update this meeting</p> <p>5/14/24: Re-evaluate mid-2025 following SPP modeling process development to document gaps or solutions identified.</p>	Closure pending	William Holden	
162	11/10/21	SPP Planning Modeling staff to present requested topics during SPCAG discussion of Short Circuit Models and analysis	<p>2/9/22: SPP solicited members for topics, survey being conducted for preferred fault model software with review of results at the May 22' meeting. Zach Sabey committed to provide updates on external Short Circuit data collection efforts.</p> <p>5/11/22: Eric Sullivan (SPP) shared MDAG survey results on short circuit model software and other preferences. The topic for discussion at the August meeting was selected to be update on short circuit build and any quality checks to be discussed.</p> <p>8/9/22: Erin Cathey (SPP) presented on the SPP Roadmap Process, Aspen presented on Short Circuit model conversion, and A/I #167 opened to</p>	In progress	Zach Sabey	

Action Item	Origin Date	Action Item	Update Summary	Status	Owner	Date Closed
			<p>submit an initiative request to improve the MDAG short circuit models for use with system protection and control</p> <p>11/9/22: Eric Sullivan (SPP) provided an update on the initiative and opportunity for feedback on the current short circuit model development. Lynn Schroeder (SECI) provided a summary of the NERC SPCWG Inter-Entity Short Circuit whitepaper. Nick Stueve (Evergy) demonstrated a short circuit model comparison tool</p> <p>2/7/23: SPCAG requested SPP Modeling Staff provide an overview at the April '23 meeting on the status of the initiative, MDAG Focus Group meetings, improvements steps, and data requests.</p> <p>4/25/23: SPP Modeling Staff deferred detailed update to the next meeting in August.</p> <p>11/8/23: Sub-group to form and update initiative language</p> <p>2/14/24: Eric Sullivan to schedule meeting.</p> <p>5/14/24: Eddie Watson provided an update on modeling teams efforts</p>			
165	05/11/22	SPCAG to explore SPP Roadmap for Short Circuit modeling program purchase.	<p>8/10/20: Process presented to the group, A/I #167 opened to submit an initiative request to improve the MDAG short circuit models for use with system protection and control</p> <p>11/9/22: Eric Sullivan (SPP) provided an update on the initiative</p> <p>2/7/23: no progress to report</p> <p>4/25/23: Closure pending SIR544 prioritization agreeable by SPCAG</p> <p>11/8/23: Closure pending SIR544 prioritization agreeable by SPCAG</p> <p>2/14/24: Closure pending SIR544 prioritization agreeable by SPCAG</p> <p>5/14/24: Eddie Watson provided an update on modeling teams efforts</p>	Closure pending	William Holden	
166	05/11/22	SPCAG to create sub-group for coordination with MDAG.	<p>8/10/22: SPCAG members have been attending MDAG Focus Group meetings</p> <p>11/9/22: Eric Sullivan (SPP) provided an update on opportunity for feedback on the current short circuit model development.</p> <p>2/7/23: no progress to report</p>	In progress	John Anderson	

Action Item	Origin Date	Action Item	Update Summary	Status	Owner	Date Closed
			<p>4/25/23: SPP Modeling staff invited SPCAG members to participate in MDAG model process</p> <p>11/8/23: Sub-group to form and update initiative language</p> <p>2/14/24: Eric Sullivan to schedule meeting</p> <p>5/14/24: Meeting with Eric and sub-group occurred, survey was developed and provided but not distributed by modeling</p>			
167	08/09/22	Submit an initiative request to improve the MDAG short circuit models for use with system protection and control	<p>11/9/22: Eric Sullivan (SPP) provided an update on the initiative</p> <p>2/7/23: no progress to report</p> <p>4/25/23: SIR544 submitted, in-process for prioritization by working groups (e.g. TWG)</p> <p>8/1/23: Eric Sullivan (SPP) provided an update on the initiative. Will consult with SPP management then provide an update by email.</p> <p>11/8/23: Sub-group to form and update initiative language</p> <p>2/14/24: Eric Sullivan to schedule meeting, to be discussed in this sub-group</p> <p>5/14/24: Eddie Watson provided an update on modeling teams efforts</p>	In progress	William Holden	
169	04/25/23	SPCAG to be engaged in TWG and MDAG to appropriately prioritize SIR544	<p>11/8/23: Sub-group to form and update initiative language</p> <p>2/14/24: Eric Sullivan to schedule meeting, to be discussed in this sub-group</p> <p>5/14/24: Eddie Watson provided an update on modeling teams efforts. SPCAG offered their assistance to ensure appropriate scope and development</p>	In progress	William Holden	
170	11/08/23	Review and approve the SPP 2024 UFLS Design Assessment Scope in consideration of Light Load evaluation	<p>11/8/23: ad-hoc meeting to evaluate and approve: budget impacts, vendor availability, case conditions compared with TPL sensitivity case, UFLS entity data request, and UFLS data request updates.</p> <p>2/14/24: Completed with out-of-cycle commitment for Light Load</p> <p>5/14/24: Members requested Scott Jordan address at the next meeting how SPP will utilize Light Load results with respect to NERC Standard PRC-006 and impacts to the three 10% steps required by the SPP UFLS Plan</p>	Closure pending	William Holden	

**SOUTHWEST POWER POOL
SYSTEM PROTECTION AND CONTROL ADVISORY GROUP MEETING**

February 13, 2024 1:00PM - 5:00PM (CPT)
February 14, 2024 8:00AM - 11:00PM (CPT)

Teleconference

SUMMARY OF MOTIONS AND ACTION ITEMS

MOTIONS:

- Steve Wadas (NPPD) motioned to approve the *November 7-8, 2023 SPCAG Meeting Minutes*. David Oswald (Liberty) seconded the motion. The motion carried without opposition or abstention.
- Steve Wadas (NPPD) motioned to approve the *January 3, 2024 SPCAG Meeting Minutes*. John Anderson (Evergy) seconded the motion. The motion carried without opposition or abstention.
- David Oswald (Liberty) motioned to approve the *SPP 2024 PRC-006-5 Under-Frequency Load Shed (UFLS) Design Assessment scope* as presented. Steve Wadas (NPPD) seconded the motion. The motion carried without opposition or abstention.

ACTION ITEMS:

- Email notification to the SPCAG Exploder following implementation of the Judson RAS.
- Share materials for PMU, FERC Order 881, 9785 checkback, and Interconnection and Protection Practices experience.

SYSTEM PROTECTION AND CONTROL ADVISORY GROUP MINUTES
2/13-14/2024

MINUTES

AGENDA ITEM 1 – ADMINISTRATIVE ITEMS

SPCAG Chair Chris Angland (OPPD) called the meeting to order at 1:00 PM on 2/13/2024. The meeting reconvened at 9:00 AM on 2/14/2024.

SPCAG Staff Secretary William Holden (SPP) took attendance and established a meeting quorum. A record of member attendance is an attachment to these minutes.

William Holden (SPP) read the SPP Antitrust Statement.

Chris Angland (OPPD) reviewed the agenda. A record of the agenda is an attachment to these minutes.

Steve Wadas (NPPD) motioned to approve the *November 7-8, 2023 SPCAG Meeting Minutes*. David Oswald (Liberty) seconded the motion. The motion carried without opposition or abstention.

Steve Wadas (NPPD) motioned to approve the *January 3, 2024 SPCAG Meeting Minutes*. John Anderson (Evergy) seconded the motion. The motion carried without opposition or abstention.

AGENDA ITEM 2 – REMEDIAL ACTION SCHEMES

THUNDERHEAD

Tom Kay (Invenergy) provided an update on the Thunderhead RAS retirement with recommendation approved at the prior SPCAG followed by TWG, ORWG, and MOPC. The SPP Reliability Coordinator approval is in progress. Working on steps through the next few quarters. Coordination with NPPD and WAPA remains ongoing to implement the relay changes needed for the open-breaker configuration within an operating guide. Changes include an upgrade to replace microwave communications channels between Grand Island and Holt stations.

RAPID CITY

Philip Westby (BEPC) provided an update on the upcoming Rapid City RAS retirement. Analysis performed by Schweitzer and further discussions with NPPD and WAPA are completed. Submission of the request will be made soon to the SPP Reliability Coordinator.

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JUDSON TEMPORARY RAS

Philip Westby (BEPC) provided an update that the Judson temporary RAS has been approved by the SPP Reliability Coordinator. Testing and implementation work is ongoing.

Steve Wadas (NPPD) inquired into the timeline of stakeholder reviews and approvals. In response Philip Westby (BEPC) provided the January 2024 dates of each approval from the TWG, SPCAG, ORWG, and MOPC followed by the SPP Reliability coordinator approval on February 9, 2024.

Jackson King (Roscommon Analytics) inquired into the timeframe for the Judson RAS implementation. In response Philip Westby (BEPC) stated the estimate is in the range of a week to weeks.

Email notification was requested to be provided to the SPCAG Exploder following implementation of the Judson RAS.

PLANNING COORDINATOR RAS REVIEWS

Scott Jordan (SPP) presented, during an executive session, an update on the NERC Standard PRC-012 Planning Coordinator evaluations of RAS within the SPP planning area. Results of the WAPA Eastern Garrison Generation Dropping Scheme (GGDS) RAS evaluation were discussed.

AGENDA ITEM 3 – SPP SYSTEM PLANNING SHORT CIRCUIT MODEL

Eddie Watson (SPP) provided an update that short circuit model software (i.e. Aspen or CAPE) and consultant to perform the model building tasks was not included in the 2024 budget. Working with Tony Green (SPP) on identifying required resources. 2025 budget will be developed in the March-April timeframe and finalized in the June-July timeframe.

Eric Sullivan (SPP) agreed to setup the previously requested sub-group meeting in about a month. Chris Angland (OPPD) requested the sub-group be opened up again with notification to SPCAG members once scheduled. Zachary Johnston (OPPD) requested the week of February 26th be avoided due to attendance at a conference. Planning software (i.e. PSS/E) to short circuit vendor software (i.e. Aspen or CAPE) model conversion issues and errors is a challenge that each member currently performs. A centralized effort by SPP would provide a uniform or consistent model for the region.

SYSTEM PROTECTION AND CONTROL ADVISORY GROUP MINUTES 2/13-14/2024

AGENDA ITEM 4 – IBR

Mostafa Sedighizadeh (SPP) presented on IEEE-2800 standard adoption and the IIRRG progress on the effort. Updates were provided for clauses 4 interconnection, 11 measurement, and 12 testing. Clause 11 review identified a gap related to SCADA and PMU. Clauses 4 & 12 recommendation is to include the addition of SPP for instances of TP.

Jeff Beasley (GRDA) inquired into language describing what happens if the IBR system changes and the IBR entities responsibility to update and correct the models presented as well as need to retest and validate.

AGENDA ITEM 5 – SPP 2024 UFLS DESIGN ASSESSMENT SCOPE

Scott Jordan (SPP) presented on *SPP 2024 PRC-006-5 Under-Frequency Load Shed (UFLS) Design Assessment* scope document. The scope of the ad-hoc meeting tentatively scheduled for December 5, 2023 was performed internally with evaluation for budget impacts, vendor availability, case conditions compared with TPL sensitivity case, UFLS entity data request, and UFLS data request updates. Light load case was considered and excluded from the scope due to concerns identified with barriers to implementation. To reduce potential for adverse schedule impacts while conducting the review, the assessment will be performed separately (out-of-cycle) and on a later schedule with results, once available, to be considered for inclusion.

David Oswald (Liberty) motioned to approve the *SPP 2024 PRC-006-5 Under-Frequency Load Shed (UFLS) Design Assessment* scope as presented. Steve Wadas (NPPD) seconded the motion. The motion carried without opposition or abstention.

AGENDA ITEM 6 – SYNCHROPHASORS (PMU)

Tom Miller (ITC) provided a brief verbal summary of SPP's PMU requirements following RR340 (FERC Docket ER19-2845) implementation in GIAs effective November 20, 2019.

Chris Angland (OPPD) mentioned that this group has been interested in PMUs and has requested presentations on various topics at prior meetings. Staff confirmed that SPP implementation doesn't meet the 15 minute threshold for NERC CIP requirements. Members requested that SPCAG be informed at the initial stages when this changes.

Mike Nugent (SPP) presented an overview of the SPP requirements and preferred communication method. Willing to coordinate a panel, deep dives, or specific topics at future meetings. **Presentation requested to be shared following the meeting.**

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AGENDA ITEM 7 – FERC ORDER 881

William Holden (SPP) provided an update on the SPP implementation of FERC Order 881.

Steve Wadas (NPPD) protection only needs to know highest potential ratings. Background is beneficial and prepares for last minute changes. MRO suggested early compliance with seasonal ratings requirements.

Presentation requested to be shared following the meeting.

AGENDA ITEM 8 – GEOMAGNETIC DISTURBANCE PROGRAM

Chris Colson (WAPA) presented on awareness and defense against Geomagnetically-induced current (GIC) from Geomagnetic disturbances (GMD) from space weather.

AGENDA ITEM 9 – RELIABILITY GROUPS

NERC SPCWG

Travis Hancock (Sunflower) provided an update on the February 2, 2024 NERC SPCWG meeting. Topics included: PRC-024 requesting reviews for voltage compliance at each IBR unit, Reliability Guideline revised to new format and reviewed as relevant reference, 61850 architects for NERC protection, and TPL-001 writing assignments to standards drafting team.

NERC STANDARDS

Shannon Mickens (SPP) provided an overview of upcoming updates to NERC Standards and Rules of Procedures. Project 2021-07 Extreme Cold Weather Grid Operations, Preparedness and Coordination drafting team has made revisions to EOP-012. NERC Standards Prioritization has categorized each project with work primarily proceeding on High Priority items. Rules of Procedures revisions with the addition of special authority became effective in November.

MRO PRS MEETING

Members in attendance did not share any noteworthy updates from the December 6, 2023 MRO PRS meeting.

Glenn Bryson (AEP) mentioned the next MRO PRS meeting is coming up on March 12, 2024. Agreed to provide an update at the May meeting.

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AGENDA ITEM 10 – PROTECTION IN YOUR SHOP

Steve Wadas (NPPD) presented on Interconnection and Protection Practices experience from a fault that resulted in circuit lockout instead of being cleared by a customer's protection equipment. **Presentation requested to be shared following the meeting.**

Steve Wadas (NPPD) requested feedback on removing the Low power test for RFL-9785 checkback DCBs relying solely on High-power test. Louis Guidry (CLECO) commented that they don't disable for low power fail, just alarm for it. Tom Miller (ITC) commented they use RFL and UPLC with high and low power tests. Zachary Johnston (OPPD) commented they have 5 161kV DCB lines remaining performing both low and high power tests, but only alarming, not automatically disabling the scheme. They can be manually disabled after seeing the alarms come in. **Email requested to be shared following the meeting.**

Steve Wadas (NPPD) shared a slow close experience, asked for feedback on mitigating for older oil based breakers.

Chris Angland (OPPD) requested a volunteer for next meeting. David Oswald volunteered.

AGENDA ITEM 11 – CLOSING ADMINISTRATIVE DUTIES

William Holden (SPP) reviewed new, open and closure pending action items.

Action Item 157 remained as Closure pending to evaluate NERC whitepaper on short circuit models integration into the MDAG process. Action item 162 remains marked as In Progress with SPP Planning Modeling staff to present requested topics during SPCAG discussion of Short Circuit Models and analysis. Action item 165 remains marked as Closure Pending to allow SIR544 prioritization to be agreeable to the SPCAG. Action item 166 remains marked as In Progress with SPCAG members invited to participate in the MDAG model process. Action item 167 remains marked as In Progress with SIR544 submitted for prioritization and consultation with SPP management. Action item 169 remains marked as Not Started for SPCAG members to be engaged in TWG and MDAG to appropriately prioritize SIR544. Action item 170 was marked as Closure Pending for SPCAG to review and approve the SPP 2024 UFLS Design Assessment Scope in consideration of Light Load evaluation A record of action items is an attachment to these minutes.

The 2024 meeting schedule and locations were discussed.

- May 14-15, 2024 (In-person, Evergy facilities in Kansas City)

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- August 13-14, 2024 (In-person, TBD)
- November 12-13, 2024 (Teleconference)

Chris Angland (OPPD) informed the group that Jeff Beasley (GRDA) is resigning from the SPCAG following the meeting and thanked him for his contributions.

Chris Angland (OPPD) recessed the SPCAG at 4:30 PM on 2/13/2024 and adjourned the SPCAG at 11:11 AM on 2/14/2024.

Respectfully Submitted,

William Holden, System Protection and Control Advisory Group, Staff Secretary

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SUMMARY OF ATTACHMENTS:

SPCAG 2/13-14/2024 Agenda (pg. 9-10)

SPCAG 2/13-14/2024 Member Attendance (pg. 11)

SPCAG Action Item Tracking (pg. 12-14)

SOUTHWEST POWER POOL, INC.

SYSTEM PROTECTION AND CONTROL ADVISORY GROUP MEETING

February 13, 2024 1:00PM - 5:00PM CPT
 February 14, 2024 8:00AM - 12:00PM CPT

Net Conference

AGENDA

1. Administrative Items:
 - a. Call to Order..... Chris Angland
 - b. AttendanceWilliam Holden
 - c. Antitrust Statement.....William Holden
 - d. Agenda Review Chris Angland
 - e. Review minutes of November 7-8, 2023 meeting (Approval)..... Chris Angland
 - f. Review minutes of January 3, 2024 meeting (Approval)..... Chris Angland
2. Remedial Action Schemes: [spp.org/Documents/62226/SPP RC PRC-012-2_0820EXT00137.pdf](http://spp.org/Documents/62226/SPP_RC_PRC-012-2_0820EXT00137.pdf)
 - a. Thunderhead RAS Retirement (Update)..... Tom Kay
 - b. Rapid City RAS Retirement (Update) Philip Westby
 - c. Judson Temporary RAS (Update) Philip Westby
 - d. Planning Coordinator RAS Reviews (Update – Executive Session)..... Scott Jordan (4:30pm)
3. SPP System Planning Short Circuit Model: [SIR544](#) (Update)Eric Sullivan
4. Inverter Based Resources (IBR):
 - a. SPP Adoption of IEEE-2800 (Update)Mostafa Sedighizadeh
5. SPP 2024 UFLS Design Assessment Scope (Approval) Scott Jordan
6. PMU (Update) Tom Miller
7. FERC Order 881 (Update)William Holden
8. Geomagnetic Disturbance Program Chris Colson
9. Reliability Groups (Update):
 - a. [NERC SPCWG](#)..... Lynn Schroeder
 - b. [NERC Standards](#).....Shannon Mickens
 - c. [MRO PRS](#) TBD
10. Protection in your shop:
 - a. Interconnection and Protection Practices.....Steve Wadas

11. Closing Administrative Duties:

- a. Review of New, Open and Closure Pending Actions.....William Holden
- b. Discuss upcoming meeting schedule, topics, and location Chris Angland
 - i. May 14-15, 2024 (In-person, Evergy facilities in Kansas City)
 - ii. August 13-14, 2024 (In-person)
 - iii. November 12-13, 2024 (Teleconference)
- c. Adjourn meeting Chris Angland

SPCAG MEMBER ATTENDANCE:

Name	Company	Role	2/13/2024	2/14/2024
Chris Angland	Omaha Public Power District	Chair	✓	✓
David Oswald	Liberty Utilities	Vice Chair	✓	✓
John Anderson	Evergy, Inc	Member	✓	✓
Jeff Beasley	Grand River Dam Authority	Member	✓	Unavailable
Matt Boersema Neudahl	Western Farmers Electric Cooperative	Member	✓	✓
Glenn Bryson	American Electric Power	Member	✓	✓
Tom Miller as proxy for Michael Fleck	ITC Great Plains	Member	✓	✓
Shawn Jacobs	Oklahoma Gas & Electric	Member	✓	✓
Spencer Riddle	Western Area Power Administration Upper Great Plains Region	Member	✓	✓
Lynn Schroeder or Travis Hancock as proxy	Sunflower Electric Power Corp	Member	✓	✓
Steve Wadas	Nebraska Public Power District	Member	✓	✓
David Wheeler	Xcel Energy	Member	✓	✓
Ken Zellefrow	City Utilities of Springfield MO	Member	Unavailable	✓
William Holden	Southwest Power Pool	Staff Secretary	✓	✓

SPCAG ACTION ITEMS

Action Item	Origin Date	Action Item	Update Summary	Status	Owner	Date Closed
157	02/10/21	SPP Staff to reach out to SPCAG to determine interest in developing PSSE/ASPEN/CAPE Conversion Whitepaper.	<p>5/12/21: Trey to send list to Lynn, and resend the request for participation.</p> <p>8/11/21: There's a current NERC effort to develop a whitepaper, and the SPP action is on hold until that paper is developed.</p> <p>11/10/21: Closure pending review of NERC paper, Q2 2022.</p> <p>5/11/22: Closure pending review of NERC paper, Q2 2022.</p> <p>8/9/22: Closure pending review of NERC paper, Q4 2022.</p> <p>11/9/22: Closure pending discussion of need for additional whitepaper.</p> <p>2/7/23: Closure pending discussion of need for additional whitepaper.</p> <p>4/25/23: Closure pending evaluation of NERC paper incorporation into MDAG process</p> <p>11/8/23: Closure pending MDAG process validations being evaluated and updated to include NERC paper recommendations, Chris Angland will investigate further to achieve closure</p> <p>2/14/24: No progress to update this meeting</p>	Closure pending	William Holden	
162	11/10/21	SPP Planning Modeling staff to present requested topics during SPCAG discussion of Short Circuit Models and analysis	<p>2/9/22: SPP solicited members for topics, survey being conducted for preferred fault model software with review of results at the May 22' meeting. Zach Sabey committed to provide updates on external Short Circuit data collection efforts.</p> <p>5/11/22: Eric Sullivan (SPP) shared MDAG survey results on short circuit model software and other preferences. The topic for discussion at the August meeting was selected to be update on short circuit build and any quality checks to be discussed.</p> <p>8/9/22: Erin Cathey (SPP) presented on the SPP Roadmap Process, Aspen presented on Short Circuit model conversion, and A/I #167 opened to submit an initiative request to improve the MDAG short circuit models for use with system protection and control</p>	In progress	Zach Sabey	

Action Item	Origin Date	Action Item	Update Summary	Status	Owner	Date Closed
			<p>11/9/22: Eric Sullivan (SPP) provided an update on the initiative and opportunity for feedback on the current short circuit model development. Lynn Schroeder (SECI) provided a summary of the NERC SPCWG Inter-Entity Short Circuit whitepaper. Nick Stueve (Evergy) demonstrated a short circuit model comparison tool</p> <p>2/7/23: SPCAG requested SPP Modeling Staff provide an overview at the April '23 meeting on the status of the initiative, MDAG Focus Group meetings, improvements steps, and data requests.</p> <p>4/25/23: SPP Modeling Staff deferred detailed update to the next meeting in August.</p> <p>11/8/23: Sub-group to form and update initiative language</p> <p>2/14/24: Eric Sullivan to schedule meeting.</p>			
165	05/11/22	SPCAG to explore SPP Roadmap for Short Circuit modeling program purchase.	<p>8/10/20: Process presented to the group, A/I #167 opened to submit an initiative request to improve the MDAG short circuit models for use with system protection and control</p> <p>11/9/22: Eric Sullivan (SPP) provided an update on the initiative</p> <p>2/7/23: no progress to report</p> <p>4/25/23: Closure pending SIR544 prioritization agreeable by SPCAG</p> <p>11/8/23: Closure pending SIR544 prioritization agreeable by SPCAG</p> <p>2/14/24: Closure pending SIR544 prioritization agreeable by SPCAG</p>	Closure pending	William Holden	
166	05/11/22	SPCAG to create sub-group for coordination with MDAG.	<p>8/10/22: SPCAG members have been attending MDAG Focus Group meetings</p> <p>11/9/22: Eric Sullivan (SPP) provided an update on opportunity for feedback on the current short circuit model development.</p> <p>2/7/23: no progress to report</p> <p>4/25/23: SPP Modeling staff invited SPCAG members to participate in MDAG model process</p> <p>11/8/23: Sub-group to form and update initiative language</p> <p>2/14/24: Eric Sullivan to schedule meeting</p>	In progress	John Anderson	

Action Item	Origin Date	Action Item	Update Summary	Status	Owner	Date Closed
167	08/09/22	Submit an initiative request to improve the MDAG short circuit models for use with system protection and control	<p>11/9/22: Eric Sullivan (SPP) provided an update on the initiative</p> <p>2/7/23: no progress to report</p> <p>4/25/23: SIR544 submitted, in-process for prioritization by working groups (e.g. TWG)</p> <p>8/1/23: Eric Sullivan (SPP) provided an update on the initiative. Will consult with SPP management then provide an update by email.</p> <p>11/8/23: Sub-group to form and update initiative language</p> <p>2/14/24: Eric Sullivan to schedule meeting, to be discussed in this sub-group</p>	In progress	William Holden	
169	04/25/23	SPCAG to be engaged in TWG and MDAG to appropriately prioritize SIR544	<p>11/8/23: Sub-group to form and update initiative language</p> <p>2/14/24: Eric Sullivan to schedule meeting, to be discussed in this sub-group</p>	Not Started	William Holden	
170	11/08/23	Review and approve the SPP 2024 UFLS Design Assessment Scope in consideration of Light Load evaluation	<p>11/8/23: ad-hoc meeting to evaluate and approve: budget impacts, vendor availability, case conditions compared with TPL sensitivity case, UFLS entity data request, and UFLS data request updates.</p> <p>2/14/24: Completed with out-of-cycle commitment for Light Load</p>	Closure pending	William Holden	