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APPLICATION OF SOUTHWESTERN PUBLIC SERVICE COMPANY FOR APPROVAL OF ITS TRANSMISSION AND DISTRIBUTION SYSTEM RESILIENCY PLAN	**§**	**BEFORE THE PUBLIC UTILITY COMMISSION OF TEXAS**

SOUTHWESTERN PUBLIC SERVICE COMPANY'S APPLICATION FOR APPROVAL OF ITS TRANSMISSION AND DISTRIBUTION SYSTEM RESILIENCY PLAN

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SOUTHWESTERN PUBLIC SERVICE COMPANY'S APPLICATION FOR APPROVAL OF ITS TRANSMISSION AND DISTRIBUTION SYSTEM RESILIENCY PLAN

In 2023, the 88th Texas Legislature enacted House Bill No. 2555 ("H.B. 2555"), now codified at Public Utility Regulatory Act ("PURA") § 38.078, to support Texas electric utilities making proactive investments to enhance the resiliency of their transmission and distribution systems. The Public Utility Commission of Texas ("Commission") implemented PURA § 38.078 by adopting 16 Texas Administrative Code ("TAC") § 25.62 (the "Resiliency Rule"). Southwestern Public Service Company ("SPS") hereby submits this Application for Approval of a System Resiliency Plan ("Application") pursuant to PURA § 38.078 and the Resiliency Rule. As detailed below, SPS's Application complies with the requirements of the Resiliency Rule.

I. INTRODUCTION

SPS serves approximately 280,000 homes and businesses in the Texas Panhandle and the Texas South Plains as a vertically integrated generation, transmission and distribution, and retail electric provider in the Southwest Power Pool. The Resiliency Rule recognizes, "[e]ach transmission and distribution system has different system characteristics and faces different resiliency events and resiliency-related risks" and the rule "provide[s] each utility with the flexibility to develop a well-tailored and systematic approach to improving the resiliency of its system."[1] SPS's expansive service area is largely rural, and its customer density is far less than many other Texas utilities, with a higher proportion of commercial and industrial ("C&I") load. SPS's service area is also unique in that it is completely encompassed by areas experiencing significantly increased wildfire risk over the last 50 years. SPS tailored its proposed resiliency

[1] 16 TAC § 25.62(a)(1).

investments to systematically address these unique system characteristics and the diverse resiliency risks that accompany them.

SPS's Application requests approval of a System Resiliency Plan ("SRP" or "Plan"), attached hereto as Attachment A, to enhance the resiliency of SPS's transmission and distribution systems in Texas (the "SPS System") that includes $538.3 million of investments tailored to the characteristics of its service area to be implemented in years 2025-2028. The Plan consists of five measures: (1) Distribution Overhead Hardening; (2) Distribution System Protection Modernization; (3) Communication Modernization; (4) Operational Flexibility; and (5) Wildfire Mitigation.

As encouraged by the Resiliency Rule, SPS engaged independent experts in resiliency and risk modeling — from 1898 & Co., the utility consulting division of Burns & McDonnell — to conduct a thorough analysis of the weather-based resiliency events that impact the SPS System to support development of this Plan. In addition, 1898 & Co. performed a benefit-cost analysis ("BCA") of the Distribution Overhead Hardening, Distribution System Protection Modernization, and Communication Modernization measures (excluding wildfire-specific aspects of these measures). 1898 & Co. evaluated the estimated costs and expected benefits of the potential projects to calculate a benefit-cost ratio ("BCR") for each measure, program, and project. Table 1 summarizes the BCA results for each measure and program that 1898 & Co. evaluated. The values in Table 1 include only the specific projects and investments that are proposed in the Plan and for which SPS seeks approval in this proceeding.

Table 1: Benefit-Cost Evaluation Summary[2]

Measure / Program	Avg. BCR	SRP Investment (2024$)	Benefits (2024$)	% Improvement in CMI
Distribution Overhead Hardening Measure (Distribution Circuit Hardening Rebuild Program)	4.7	$232.5M	$1,094.5M	58%
Distribution System Protection Modernization: Mainline Automated Reclosing Deployment Program	4.2	$79.7M	$333.0M	37%
Distribution System Protection Modernization: Lateral Reclosing Deployment Program	1.8	$2.0M	$3.5M	21%
Communication Modernization[3]	N/A	$104.6M	$104.6M	N/A
Total	**3.4**	**$418.8M**	**$1,431M**	**N/A**

As shown in Table 1, the overall BCR for the proposed investments evaluated by 1898 & Co. is approximately 3.4. This means that the investments proposed in the SRP will collectively provide customers with benefits 3.4 times greater than their costs. These benefits include significant reductions in customer outages—approximately 58% for circuits where hardening investment is made, 37% for circuits modernized under the mainline reclosing program, and 21% for circuits modernized under the lateral reclosing program.

SPS also engaged EDM International ("EDM"), a consulting firm specializing in wildfire mitigation, to help SPS assess wildfire risk to the SPS System and to develop a strategy for prioritizing programs to maximize wildfire mitigation. EDM also developed a geospatial Wildfire Risk Map of the SPS service area that allows SPS to visualize and understand the wildfire risk level across the different regions of its service area.

[2] Table 1 presents proposed SRP investments in 2024 dollars, as opposed to the SPS cost estimates presented in Table 4 below and in the SRP, which are nominal values that include annual escalation over the three-year investment period. As explained by Mr. De Stigter, 1898 & Co.'s Resilience & Risk Investment Model uses present values to make an apples-to-apples comparison between the present costs of investments against the present value of their benefits over a 50-year expected life.

[3] The Communication Modernization investment enables the full effectiveness of the Mainline Automated Reclosing Deployment program. Section 6.2.4.1 of the 1898 & Co. Report shows a BCR of 4.3 for the mainline automation program. The combined BCR for Communication Modernization and Mainline Automated Reclosing Deployment is 1.8.

The Commission's approval of this SRP will significantly enhance SPS's efforts to build a more resilient electric system and will benefit customers through a reduced frequency and duration of outages; avoided system restoration costs; improved overall reliability resulting from newly hardened and modernized infrastructure that is better equipped to withstand, mitigate, and more promptly recover from risks posed by extreme weather events, wildfires, and other threats; reduced wildfire ignition risk; and improved overall safety and system stability. SPS respectfully requests that the Commission approve its SRP, and the resiliency measures proposed therein, as well as SPS's request to defer the associated distribution costs to a regulatory asset for recovery in future ratemaking proceedings.

II. JURISDICTION AND AFFECTED PARTIES

SPS is a New Mexico corporation and a wholly owned subsidiary of Xcel Energy Inc. ("Xcel Energy"). SPS is headquartered in Amarillo, Texas, and its business address is 790 S. Buchanan Street, 7th Floor, Amarillo, Texas 79101. SPS is a vertically integrated generation, transmission, and distribution utility that serves wholesale and retail electric customers in Texas and New Mexico.

SPS is a "public utility" as defined in PURA § 11.004(1) and an "electric utility" as defined in PURA § 31.002(6). As such, SPS's Texas operations are subject to the Commission's jurisdiction under PURA. The Commission has jurisdiction over this application under PURA §§ 14.001 and 38.078 and 16 TAC § 25.62. This application affects SPS and all of its Texas retail customers.

III. AUTHORIZED REPRESENTATIVES AND SERVICE OF DOCUMENTS

SPS's authorized representatives for this proceeding are:

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SPS requests that all documents (e.g., motions, orders, discovery requests, and discovery responses) be served on its authorized representatives.

IV. SUMMARY OF APPLICATION

A. Filing Overview

SPS's proposed Plan is Attachment A to this Application. SPS's Plan includes all of the information required by 16 TAC § 25.62(c) as outlined in more detail below.[4]

Consistent with 16 TAC § 25.62(d)(1), SPS's letters of notice to (1) all municipalities in SPS's service area that have retained original jurisdiction, (2) all parties in SPS's most recent base-rate proceeding, (3) the Office of Public Utility Council ("OPUC"), and (4) Southwest Power Pool are attached to this Application as Attachment B. Finally, SPS's proposed Protective Order is attached to this Application as Attachment C.

In further support of SPS's Application, the following SPS witnesses are filing direct testimony as described in Table 2 below.

[4] An application is sufficient if it includes the information required by subsection (c) of this section and the electric utility has filed proof that notice has been provided in accordance with this subsection. 16 TAC § 25.62(c).

Table 2 – SRP Direct Testimony and Sponsorship

Witness	Area of Testimony	Bates Page #	Sponsored SRP Section(s)
Adrian J. Rodriguez SPS President	Introduces and supports SPS's SRP; provides overview of SPS's service territory, customer makeup, and resiliency events that pose a risk to the SPS System; discusses SPS's approach to resiliency and the actions it is currently taking to advance resiliency of its system.	311	None
Brooke A. Trammell SPS Regional Vice President, Regulatory and Pricing	Supports SPS's SRP, including all measures and programs therein; presents budgeting for the SRP; discusses SRP cost recovery; explains and supports SPS's proposed tracking and accounting plan for SRP-related costs; discusses state and federal resiliency-related funding opportunities; describes SPS's proposed SRP evaluation metrics.	328	All Sections
Casey S. Meeks SPS Regional Vice President, Distribution Operations	Describes SPS's distribution system and specific factors connected to resiliency issues; explains the impact resiliency events have on SPS distribution system operations; discusses SPS's SRP implementation strategy.	372	Section III.C Section V
Brianne R. Jole Xcel Energy Services Inc. Manager, System Planning and Strategy, Distribution Integrated Planning	Describes SPS's coordination with 1898 & Co. in developing the SRP; introduces SRP measures; discusses SPS's current and ongoing approach to resilience and prioritization in SRP program selection; describes and supports the Distribution Overhead Hardening, Distribution System Protection Modernization, and Operational Flexibility SRP measures.	400	Section III Section IV.A Section IV.B Section IV.D
Wendall A. Reimer Xcel Energy Services Inc. Director II (IT) - Application Delivery, Technology Services	Supports the Communication Modernization measure; discusses migration of SPS's OT communications to a private LTE network; explains the resiliency benefits associated with the proposed private communications infrastructure.	445	Section II.C Section IV.C Section V
Jason D. De Stigter 1898 & Co. Director,	Introduces, summarizes, incorporates, and supports the Resilience Investment Study performed by 1898 & Co. for SRP	470	Section II.A

Witness	Area of Testimony	Bates Page #	Sponsored SRP Section(s)
Utility Investment Planning	development (the "1898 & Co. Report"); explains the methodology used by 1898 & Co. in its evaluation.		1898 & Co. Report (SRP Attachment A)
Anne Z. Sherwood Xcel Energy Services Inc. Area Vice President, Wildfire Mitigation: Regulatory and Policy	Supports and describes the Wildfire Mitigation measure; discusses wildfire risks within SPS's service area and SPS's current wildfire mitigation and risk assessment activities; describes SPS's engagement of outside expert consultants to advance wildfire-related resiliency.	520	Section IV.E Section V
Ryan Brockbank EDM International, Inc. Principal	Discusses and supports the Wildfire Mitigation measure; provides an explanation of wildfire risk mapping and SPS's Wildfire Operations Map.	545	Section II.B

B. SPS System and Service Area and Resiliency Events Affecting Them [16 TAC § 25.62(c)(2)(B)]

SPS serves approximately 52,000 square miles across Texas and New Mexico and 280,000 homes and businesses in the Texas Panhandle and Texas South Plains. Much of SPS's service area is rural but interspersed with sizable population centers, like Amarillo. The load on the SPS System is predominantly commercial and industrial. Due to the largely rural character of SPS's expansive service area, SPS's customer density is far less than many other Texas utilities. Functionally, this means SPS has fewer customers per mile of distribution line than many other utilities in the State.

The weather in SPS's service area in Texas can be violent and variable. SPS's service area can experience weather events ranging from icing and blizzards to extreme heat and drought, flooding, high winds, and tornadoes. High winds and winter weather have the greatest impact on the SPS System and customers. High winds account for nearly 70% of all outages from 2010 through 2023, and over 45% of Customer Minutes Interrupted ("CMI") over that same period. Winter weather accounts for 8.5% of outages during that period, but its per-outage impact is much higher, accounting for over 50% of CMI during that time frame.

In addition to the direct impacts of these weather events to the SPS System, some events also increase the likelihood of wildfires. SPS's service area is completely encompassed by areas experiencing significantly increased wildfire risk over the last 50 years. The predominant fuels in

the region are finer fuels such as grasses and small woody shrubs that are highly susceptible to fire risk during dry, windy conditions. And as extreme weather conditions become more frequent, SPS must prepare for increasing wildfire activity.

Consistent with 16 TAC § 25.62(c)(2)(B), SPS's Plan (1) identifies and describes each type of resiliency event and related risks the Plan is designed to address, (2) includes magnitude thresholds where appropriate, (3) describes the SPS System characteristics that make it susceptible to identified resiliency events, and (4) provides evidence to support the presence of and risks posed by the identified resiliency events.

C. SPS's System Resiliency Plan Overview [16 TAC § 25.62(c)(1) and (c)(2)(A)]

As required by 16 TAC § 25.62(c)(2), SPS has organized its SRP by measure and proposes five measures — (1) Distribution Overhead Hardening, (2) Distribution System Protection Modernization, (3) Communication Modernization, (4) Operational Flexibility, and (5) Wildfire Mitigation — each with a number of new or expanded programs and activities designed to address one or more resiliency events that pose a material risk to the safe and reliable operation of the SPS System. Each proposed measure uses at least one of the methods set forth in PURA § 38.078(b) and 16 TAC § 25.62(c)(1).

Further, consistent with PURA § 38.078 and 16 TAC § 25.62(c)(2)(A), SPS's Plan (1) explains SPS's prioritization of identified resiliency events, the particular geographic area, system, or facilities where measures will be implemented; (2) includes evidence of the effectiveness of the measures; (3) explains the expected benefits of the resiliency measures including but not limited to, reduced system restoration costs and reduction in the frequency of outages for customers; (4) identifies if a resiliency measure is part of a coordinated effort with federal, state, or local government programs or may benefit from federal, state, or local government funding opportunities; (5) explains the selection of a particular measure over any reasonable and readily identifiable alternatives; and (6) identifies any measures that may require a transmission system outage to implement.

Additional detail on each measure is provided in the direct testimonies of their sponsoring witnesses, Brianne Jole, Casey Meeks, Wendall Reimer, and Anne Sherwood. The measures, associated program activities, and resiliency event categories mitigated are summarized as follows.

Table 3 – SRP Measures & Programs

Measure	Measure Program Activities	Resiliency Event Category Mitigated
Distribution Overhead Hardening	• Pole Replacements/Installations • Conductor Replacements • Line Transformer Replacements • Pole Wraps in High Wildfire Risk Areas • Pole Trussing	Wind, Flood, Tornado, Winter, Heat, Cold and Wildfire

Distribution System Protection Modernization	• Program 1 – Mainline Automated Reclosing Deployment
	  ○ New Mainline Automated Reclosers
	  ○ Existing Recloser Replacements & Communication Installation,
	  ○ Substation Relay Panel Replacements and Substation Breaker Replacements,
	  ○ Fault Indicator Installations,
	  ○ Tap Fuse Replacements
	• Program 2 – Lateral Reclosing Deployment
	  ○ Lateral Recloser Installations
		Wind, Flood, Tornado, Winter, Heat, Cold and Wildfire

Communication Modernization	• Private LTE towers • Fiber Optic Cable on Transmission Lines • Additional Remote Terminal Units at Substations	Wind, Flood, Tornado, Winter, Heat, Cold, Wildfire, and Cybersecurity

Operational Flexibility	• Program 1 – Mobile Substation Equipment
	  ○ Mobile Substations
	  ○ Regulator Trailer
	  ○ Circuit Switcher Trailer
	• Program 2 – Installation of Transmission Switches
	  ○ Loadbreak and non-loadbreak switches
		Wind, Flood, Tornado, Winter, Heat, and Cold

Wildfire Mitigation	• Program 1 – Situational Awareness
	  ○ Weather Stations
	  ○ AI Cameras
	  ○ Best-in-class Weather and Fire Science Modeling Software
	• Program 2 – Physical Mitigation
	  ○ Poles with enhanced vegetation management
	  ○ Wood Substation Conversions
	  ○ Detailed Inspections in wildfire areas
		Wildfire

The total estimated capital cost of the SRP is $521.5 million, and the incremental operating expenses are $16.8 million. Table 4 below provides a summary of the estimated capital costs, incremental expenses, and implementation timelines for each proposed measure.

Table 4 – Implementation Timeline and Estimated Costs

Measure	Implementation Timeline	Estimated Spend (in $Millions)
Distribution Overhead Hardening	2025	Capital: $19.5 O&M: 0
	2026	Capital: $56.1 O&M: 0
	2027	Capital: $75.7 O&M: 0
	2028	Capital: $101.7 O&M: 0
Distribution System Protection Modernization	2025	Capital: $8.1 O&M: 0
	2026	Capital: $19.4 O&M: 0
	2027	Capital: $28.3 O&M: 0
	2028	Capital: $36.5 O&M: 0
Communication Modernization	2025	Capital: 0 O&M: 0
	2026	Capital: $34.2 O&M: 0
	2027	Capital: $37.1 O&M: 0
	2028	Capital: $41.4 O&M: 0
Operational Flexibility	2025	Capital: $3.1 O&M: 0
	2026	Capital: $10.1 O&M: 0
	2027	Capital: $23.8 O&M: $0.002
	2028	Capital: $6.7 O&M: $0.004
Wildfire Mitigation	2025	Capital: $2.5 O&M: $2
	2026	Capital: $7.6 O&M: $4.5
	2027	Capital: $8 O&M: $5.2

Measure	Implementation Timeline	Estimated Spend (in $Millions)
	2028	Capital: $1.7 O&M: $5.1
	Total:	**Capital: $521.5** **O&M: $16.8**
	Grand Total:	**$538.3**

D. Evaluation Metrics and Criteria [16 TAC § 25.62(c)(2)(C)]

Section 25.62(c)(2)(C) of the Resiliency Rule requires each SRP to include metrics or criteria for evaluating the effectiveness of each measure in preventing, withstanding, mitigating, or more promptly recovering from the risks associated with the resiliency event it is designed to address. SPS is proposing evaluation metrics and criteria, which are detailed in Section V of the SRP and in the direct testimonies of SPS witnesses Ms. Trammell providing an introduction to metrics, Mr. Meeks regarding Overhead Hardening, Distribution System Protection Modernization and Operational Flexibility, Mr. Reimer regarding Communication Modernization, and Ms. Sherwood regarding Wildfire Mitigation. Further, each resiliency measure under Section IV of the Plan includes a subsection dedicated to applicable metrics. The following table summarizes SPS's proposed metrics.

Table 5 – SRP Metrics

Metric	Distribution Overhead Hardening	Distribution System Protection Modernization	Communication Modernization	Operational Flexibility	Wildfire Mitigation
Underperforming Area Count	X	X	X		
Rolling 10-Year Average SAIDI	X	X	X	X	
Storm Restoration Duration	X	X	X		
Average Hardened Protection Zone (AHPZ) CI vs Average Protection Zone (APZ) CI Comparison by County (Hardened Only)	X				
AHPZ CI Percentage Improvement	X				
RAN Tower Completion			X		
End Device Connectivity			X		
Units Completed in DSAP					X
Transmission Inspections					X

The respective testimonies explain the appropriateness of the selected evaluation metric for each resiliency measure. SPS developed its proposed metrics to provide a quantitative assessment of the effectiveness of the resiliency measures proposed in this SRP. Finally, the Plan includes an analysis of the expected effectiveness of the selected metrics as discussed below.

E. Evidence of Effectiveness and Benefits [16 TAC § 25.62(c)(2)(C)(iii)]

SPS retained independent entities with relevant expertise to provide quantitative and/or performance-based evaluations of SPS's proposed resiliency measures. To assess the risks posed by weather-based resiliency risks, SPS contracted with 1898 & Co., a consulting engineering firm with extensive expertise in the electrical industry, including experience modeling resiliency risks and investments. 1898 & Co. personnel coordinated with SPS to assist in the design of the proposed measures, model the resiliency risks to the SPS System, and provide evidence of the expected benefits for the proposed SRP measures. 1898 & Co. performed a quantitative benefit-cost analysis for three of SPS's Plan measures. The result of 1898 & Co.'s assessment is the 1898 & Co. Report, included as Attachment A to the SRP. As SPS witness Jason De Stigter discusses, the 1898 & Co. Report shows that SPS's SRP will provide direct, quantifiable benefits to SPS customers in the form of reduced frequency and duration of outages and reduced outage-restoration costs. As an example, the lowest benefit-cost ratio of any project included in the Distribution Overhead Hardening measure is 3.22. This means that these projects will provide at least three times the economic benefit to customers as the cost to implement the project.

SPS contracted with EDM International, a consulting firm with extensive experience performing wildfire-risk modeling and assessment for electric utilities, to conduct a performance-based analysis of SPS's Wildfire Mitigation measure and create a Wildfire Operations Map specific to SPS's service territory. As discussed in Sections II.B and IV.E of the Plan and the direct testimony of SPS witness Ryan Brockbank, EDM's analysis demonstrates that improved situational awareness, grid hardening, and other pre-planning to help reduce the negative impacts to SPS customers and stakeholder from resiliency events are consistent with leading utility practice and regulator expectations.

Together, the 1898 Report and EDM analysis provide evidence of the effectiveness and benefits of SPS's proposed resiliency measures. SPS proposes use of metrics in evaluating the effectiveness of the measures in the SRP, as discussed in the direct testimonies of SPS witnesses Mr. Meeks regarding Overhead Hardening, Distribution System Protection Modernization and Operational Flexibility, Mr. Reimer regarding Communication Modernization, and Ms. Sherwood regarding Wildfire Mitigation.

F. Systematic Implementation Approach [16 TAC § 25.62(c)(2)(D), (c)(2)(E), and (c)(2)(F)]

SPS's Plan includes entirely incremental work. To the extent the Plan programs are similar to existing programs, the Plan appropriately delineates the two and explains coordination with existing programs, pursuant to 16 TAC § 25.62(c)(2)(D).

SPS has developed a systematic implementation approach to prioritize investments in this SRP, consistent with 16 TAC § 25.62(c)(2)(E). SPS ultimately selected the measures, programs, and projects presented in this SRP based on several objectives, including: (1) mitigating the impacts of resiliency events with the greatest impacts on the SPS system and its customers, as determined by SPS's operational experience and the 1898 & Co. analysis; (2) furthering SPS's long-term resiliency objectives, including mitigating wildfire risks and modernizing system protection capabilities; (3) leveraging the BCR, which accounts for the historical performance of the system during resiliency events; and (4) optimizing the overall size of the Plan, with consideration for the costs to customers and SPS's ability to execute on the full portfolio of proposed investments between 2025 and 2028.

Ms. Jole's direct testimony describes SPS's prioritization framework and systematic implementation approach in more detail. Mr. DeStigter describes the results of 1898 & Co.'s analysis, as summarized in Table 6, in more detail in his direct testimony.

Table 6: Benefit-Cost Evaluation Summary[5]

Measure / Program	Avg. BCR	SRP Investment (2024$)	Benefits (2024$)	% Improvement in CMI
Distribution Overhead Hardening Measure (Distribution Circuit Hardening Rebuild Program)	4.7	$232.5M	$1,094.5M	58%
Distribution System Protection Modernization: Mainline Automated Reclosing Deployment Program	4.2	$79.7M	$333.0M	37%
Distribution System Protection Modernization: Lateral Reclosing Deployment Program	1.8	$2.0M	$3.5M	21%
Communication Modernization[6]	N/A	$104.6M	$104.6M	N/A
Total	**3.4**	**$418.8M**	**$1,431M**	**N/A**

As shown in Table 6, the overall BCR for the investments evaluated by 1898 & Co. is approximately 3.4. These investments also show a significant improvement in customer outages, approximately 58% for those circuits where hardening investment is made and approximately 37% for mainline automation.

Mr. Meeks describes how SPS will procure the contract resources and materials required to execute its systematic implementation approach over a three-year period, as well as how SPS will comply with the reporting requirements of the Resiliency Rule. Finally, Ms. Trammell explains how SPS will account for and track its SRP-related investments, as well as SPS's intention to defer recovery of its resiliency-related distribution costs as a regulatory asset for recovery in future ratemaking proceedings.

[5] Table 6 presents the total proposed SRP investment in 2024 dollars as opposed to the cost estimates SPS presents in Table 4 above and the SRP, which are nominal values that include annual escalation over the three-year investment period. As explained by Mr. DeStigter, 1898 & Co.'s Resilience & Risk Investment Model uses present values to make an apples-to-apples comparison of the present costs of investments against the present value of their benefits over a 50-year expected life.

[6] The Communication Modernization investment enables the full effectiveness of the mainline automated reclosing deployment program. Section 6.2.4.1 of the 1898 & Co. Report showed a BCR of 4.3 for the mainline automation program. The combined program BCR is 1.8.

SPS will need to deviate from any approved implementation schedule if the Southwest Power Pool has not approved an outage that would be required to timely implement the Plan, pursuant to 16 TAC § 25.62(c)(2)(F).

G. Plan Executive Summary [16 TAC § 25.62(c)(2)(G)]

SPS's Plan includes an Executive Summary at Section I, and a comprehensive chart as Attachment B to the Plan, that explains the Plan's objectives, the resiliency events or related risks the Plan is designed to address, the Plan's measures, the proposed metrics for evaluating the Plan's effectiveness, the Plan's cost and benefits, and an explanation of how the overall Plan is in the public interest.

V. RELIEF REQUESTED

Based on this Application and supporting evidence, including the SRP, the SRP's attachments, and testimony, SPS respectfully requests that the Commission:

i. find SPS's proposed SRP is in the public interest and compliant with 16 TAC § 25.62, and approve it;

ii. authorize SPS to implement the SRP through 2028 or at least three years after any approval of this SRP, whichever is later, unless SPS requests to amend the SRP with the amendment to take effect no later than three years from an approval of this SRP;

iii. approve SPS's requested flexibility in implementation as described in the SRP;

iv. authorize SPS to establish a regulatory asset to capture distribution-related costs related to the implementation of the SRP;

v. authorize a twelve-month amortization period for the regulatory asset as requested in (iii);

vi. authorize SPS to defer all costs associated with the preparation and defense of this application;

vii. approve SPS's proposed metrics as stated in the SRP; and

viii. grant all other relief the Commission deems necessary or appropriate.

VI. NOTICE

SPS is providing notice of this Application pursuant to PURA § 38.078(e) and 16 TAC § 25.62(d)(1). Notice is being provided to: (1) all municipalities in SPS's service area that have retained original jurisdiction; (2) all parties in SPS's most recent base-rate proceeding; (3) OPUC; and (4) Southwest Power Pool. SPS's letters of notice, pursuant to the Resiliency Rule, are attached to this application as Attachment B. In accordance with 16 TAC § 25.62(d)(1), the intervention deadline in this proceeding will be January 30, 2025, 30 days after service of notice is complete.

VII. MOTION FOR ENTRY OF A PROTECTIVE ORDER

SPS expects that it may need to provide in testimony, workpapers, or responses to discovery requests confidential or highly sensitive information the disclosure of which to third parties would either place SPS at a severe competitive disadvantage or cause SPS to violate contractual confidentiality obligations. Accordingly, SPS is attaching a proposed protective order to this application as Attachment C, which will facilitate parties' access to the confidential or highly sensitive material while protecting the interests of SPS and the third parties to whom SPS owes confidentiality obligations.

The proposed protective order is substantially the same as the Commission's standard protective order and the protective order approved in Docket No. 54634, SPS's most recent base rate case.[7] SPS requests that the Commission enter a protective order in the form attached to this application as Attachment C. SPS further proposes that, pending entry of the protective order, the parties agree to treat the proposed protective order as a confidentiality agreement.

VIII. CONCLUSION

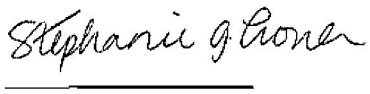
SPS's SRP is a comprehensive and evidence-based plan developed in collaboration with third-party experts to address the specific needs of its customers, given the unique characteristics of SPS's Texas service area. The Plan utilizes decades of quantitative, qualitative, and historical data to prioritize risks by events and geography and recommends targeted investments to reduce

[7] Docket No. 54634, Order No. 1 at 2 (Mar. 6, 2023).

the impact of severe weather events and wildfire. The 1898 & Co. analysis finds that — exclusive of qualitative and wildfire-related benefits — the Distribution Overhead Hardening, Distribution System Protection Modernization, and Communication Modernization measures SPS SRP present an enormous opportunity for SPS to cost-effectively strengthen its system and make it more resilient for its customers and communities. EDM concluded that the measures proposed represent leading utility wildfire management strategies.

For the reasons stated in this Application, the Plan, the Plan's attachments, and the supporting testimony and exhibits, SPS asks the Commission to (i) find SPS's proposed SRP is in the public interest and compliant with 16 TAC § 25.62, and approve it; (ii) authorize SPS to implement the SRP through 2028 or at least three years after any approval of this SRP, whichever is later, unless SPS requests to amend the SRP with the amendment to take effect no later than three years from an approval of this SRP; (iii) approve SPS's requested flexibility in implementation as described in the SRP; (iv) authorize SPS to establish a regulatory asset to capture distribution-related costs related to the implementation of the SRP; (v) authorize a twelve-month amortization period for the regulatory asset requested in (iii); (vi) authorize SPS to defer all costs associated with the preparation and defense of this application; (vii) approve SPS's proposed metrics as stated in the SRP; and (viii) grant all other relief the Commission deems necessary or appropriate.

Respectfully Submitted,



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Xcel Energy®
SYSTEM RESILIENCY PLAN
Southwestern Public Service Company
December 31, 2024

System Resiliency Plan

Southwestern Public Service Company

CONTENTS

I. EXECUTIVE SUMMARY

A. Overview of the Filing

Southwestern Public Service Company ("SPS") appreciates the opportunity to present its first System Resiliency Plan ("SRP" or "the Plan") designed to enhance the resiliency of its Texas transmission and distribution systems ("SPS System") consistent with Public Utility Regulatory Act ("PURA") § 38.078 and 16 Texas Administrative Code ("TAC") § 25.62 (the "Resiliency Rule").

This Plan will benefit SPS customers and promote the public interest through reduced frequency of power outages and outage times; cost savings from decreased storm recovery costs and expensive emergency repairs; a hardened infrastructure and equipment to withstand weather events and other threats; improved overall safety, reliability and system stability; and a more modern and flexible system that can better serve our customers. It also includes specific investments addressing wildfire risk and upgrading communication capabilities for protection, response, and recovery.

SPS's filing requests approval of $538.3 million of investments to be implemented in years 2025-2028 through the following measures:

- **Distribution Overhead Hardening**
  - *Targeted circuit hardening and rebuilds: replacing and reinforcing distribution poles, replacing conductor, line transformers, and open-wire secondary, mitigating long span lengths, and, in high wildfire risk areas, wrapping poles with fire resistant coatings and replacing arrestors and transformer fuses with non-expulsion alternatives.*
- **Distribution System Protection Modernization**
  - *Optimizing protection schemes with new equipment, including sectionalizing reclosers, mid-point (tie) reclosers,*[1] *communications equipment, updated substation relay panels and breakers, and, in high wildfire risk areas, fault current indicators and non-expulsion fuse alternatives*

[1] Throughout this plan, testimony, and the 1898 & Co. Report, mid-point (tie) reclosers are sometimes referred to simply as tie reclosers. These are the same products and will be deployed consistent with the SPS Operating Manual.

- **Communication Modernization**
    - *Building out a Private LTE network, installing fiber optic cable on select transmission lines, and adding remote terminal units at substations, which will help enable the benefits of the distribution modernization measure.*
- **Operational Flexibility**
    - *Procuring mobile substation equipment and installing additional switching devices on select transmission circuits.*
- **Wildfire Mitigation**
    - *Acquiring weather stations to enhance SPS's meteorological capabilities, adopting weather and fire science modeling, deploying artificial intelligence ("AI") cameras to more effectively detect wildfire threats, vegetation management to create defensible spaces around structures, wood substation conversions, and detailed visual inspections.*

Below, SPS discusses the resiliency risks experienced in its service area, how SPS analyzed those risks and potential measures to mitigate them, and the measures ultimately selected for proposal in this SRP. SPS also discusses how these measures benefit its customers and the public interest and provides the metrics to evaluate their effectiveness going forward.

B. Resiliency Risks in SPS's Service Territory

SPS is a wholly owned electric utility subsidiary of Xcel Energy, Inc., headquartered in Amarillo, Texas. SPS serves approximately 52,000 square miles across its Texas and New Mexico service territory and 280,000 homes and businesses in the Texas Panhandle and Texas South Plains as a vertically integrated generation, transmission and distribution, and retail electric provider in the Southwest Power Pool (outside of the Electric Reliability Coordinating Council of Texas). Much of SPS's service area is rural but interspersed with sizable population centers, like Amarillo. The load on SPS's System is predominantly commercial and industrial. Due to the largely rural character of SPS's expansive service area, SPS's customer density is far less than many other Texas utilities. Functionally, this means that SPS has fewer customers per mile of distribution line than many other utilities in the State.

Texas Panhandle weather is variable and can be violent. SPS's service area can experience weather events ranging from icing and blizzards, to extreme heat and drought, flooding, high winds, and tornadoes. As shown in the figures below, high winds and winter weather have the

greatest impact on SPS's system and customers. High winds account for nearly 70 percent of all outages from 2010 through 2023, and over 45 percent of "Customer Minutes Interrupted" or "CMI" over that same period. While winter weather accounts for 8.5 percent of outages during that period, its per-outage impact is much higher, accounting for over 50 percent of CMI during that time frame.

Figure 1 – Mapped CMI to NOAA Events

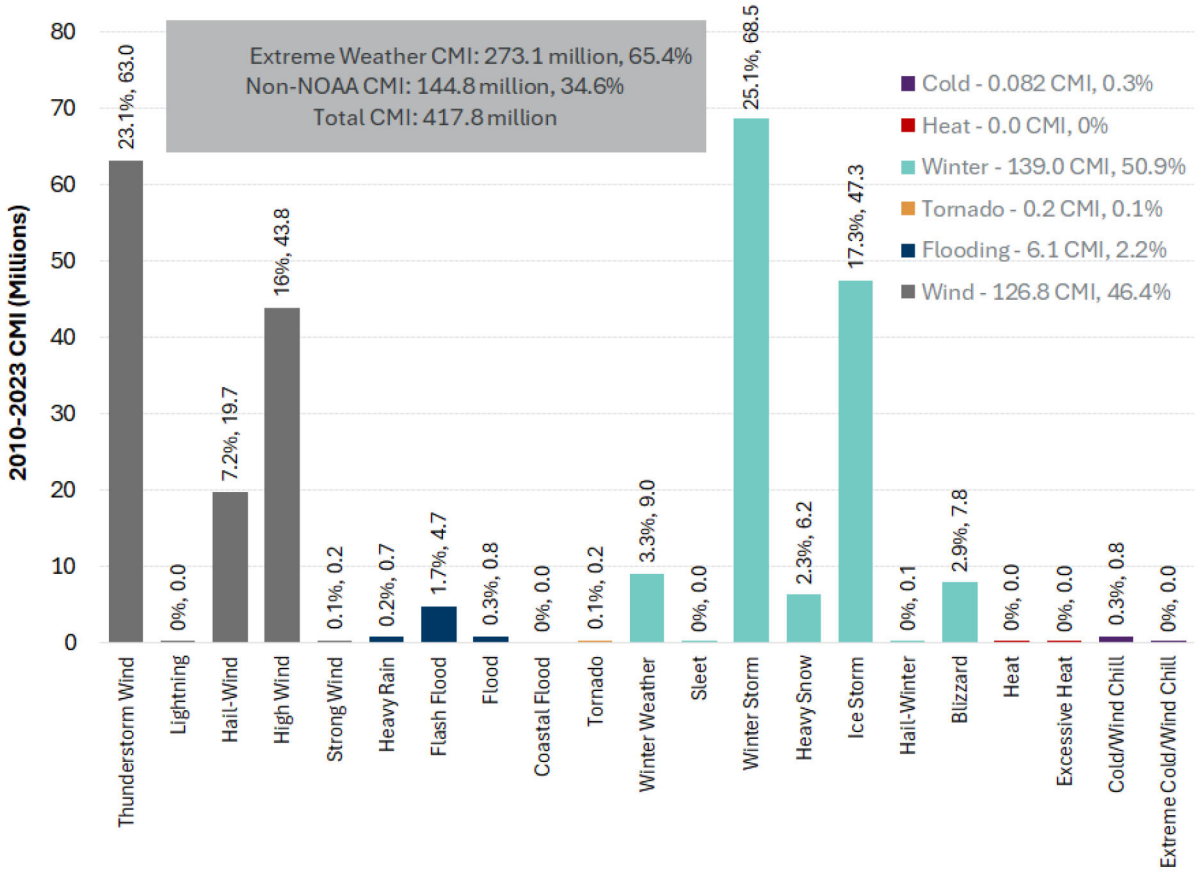
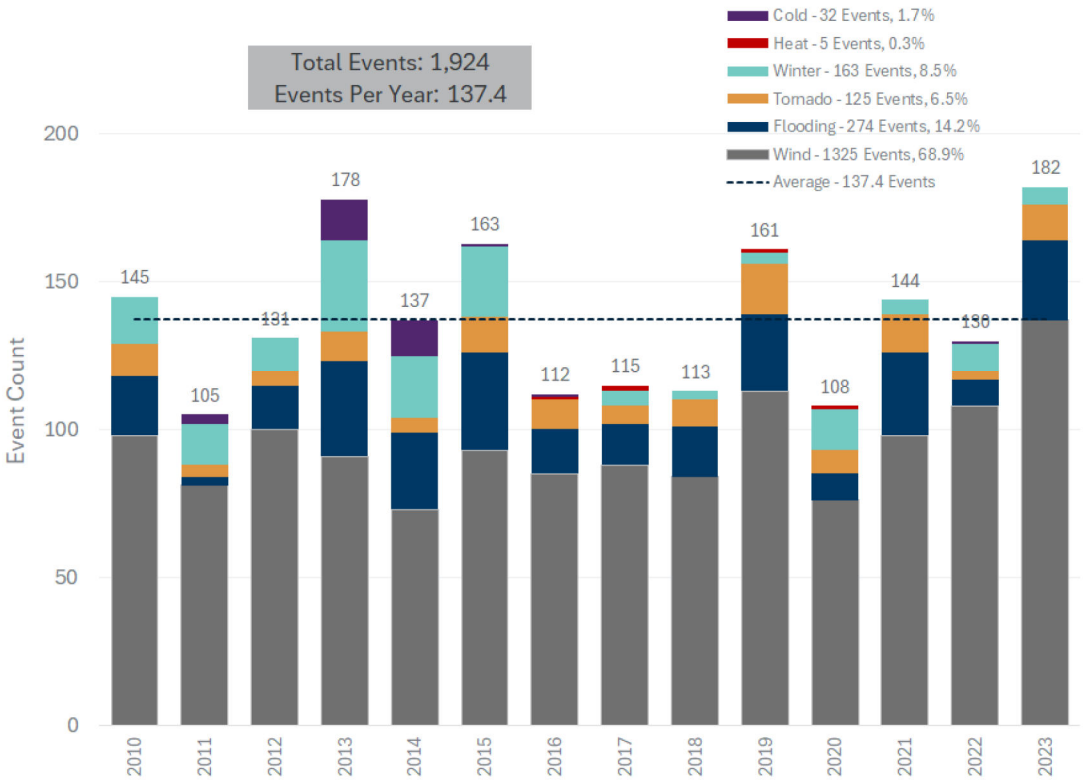


Figure 2 – NOAA Events Identified in SPS's Outage Records (2010-2023)



In addition to the direct impacts of these weather events to the SPS System, some events also increase the likelihood of wildfires. SPS's service area is completely encompassed by areas experiencing significantly increased wildfire risk over the last 50 years. The predominant fuels in the region are finer fuels such as grasses and small woody shrubs that during dry, windy conditions are highly susceptible to fire risk. And as extreme weather conditions become more frequent, SPS must prepare for increasing wildfire activity.

C. Method of Determining SRP Programs and Measures

The Resiliency Rule encourages utilities to work with independent consultants to develop and evaluate measures proposed within the SRP. SPS engaged 1898 & Co. to conduct a thorough analysis of weather and other resiliency events that impact SPS's Texas service area, to support development of this Plan. SPS and 1898 & Co. collaborated on measures focused on weather-based resiliency, including investment activities to support wildfire resiliency. 1898 & Co. performed a cost benefit analysis of the Distribution Overhead Hardening, Distribution System

Protection Modernization, and Operational Flexibility SRP measures based on the estimated costs of the projects and a benefit-cost ratio ("BCR") analysis.

1898 & Co. utilized a resilience and risk-based planning approach to identify, prioritize, and perform benefit modeling to support the development of the SRP. The resilience and risk-based planning approach utilizes a suite of planning models that collectively comprise the Integrated Resilience and Risk Investment Model. The 1898 & Co. model includes foundational data, including a catalogue of the historical resiliency events that impacted the SPS System and information from SPS's asset register, including equipment age and characteristics, to determine the unique vulnerabilities of SPS's System. The model's actionable investment activities prioritize resilience and risk-based investments based on available data, analytics models, and benefit-cost analyses.

This approach calculates the resilience and risk improvement at the investment activity, program, protection zone, and measure levels. Resilience and risk benefits for resilience investment activities are estimated from a customer-centric perspective in alignment with subsection (c)(2)(A)(iii) of the Resiliency Rule. The customer benefits are shown in terms of the decrease in utility restoration costs, the decrease in the number of customers impacted, and the duration of the overall outage. The results of 1898 & Co.'s modeling are shown in Table 1 below, with the Distribution System Protection Modernization measure showing the highest average BCR at 3.0, and the Communication Modernization measure showing the lowest average BCR at 1.8.

Table 1: Benefit-Cost Evaluation Summary Table[2]

Measure / Program	Avg. BCR	SRP Investment (2024$)	Benefits (2024$)	% Improvement in CMI
Distribution Overhead Hardening Measure (Distribution Circuit Hardening Rebuild Program)	4.7	$232.5M	$1,094.5M	58%
Distribution System Protection Modernization: Mainline Automated Reclosing Deployment Program	4.2	$79.7M	$333.0M	37%
Distribution System Protection Modernization: Lateral Reclosing Deployment Program	1.8	$2.0M	$3.5M	21%
Communication Modernization[3]	N/A	$104.6M	$104.6M	N/A
Total	**3.4**	**$418.8M**	**$1,431M**	**N/A**

SPS also engaged EDM International ("EDM") a consulting firm specializing in wildfire mitigation to help SPS assess wildfire risk to the SPS System and to develop a strategy for prioritizing programs that would maximize wildfire mitigation. EDM developed a geospatial Wildfire Risk Map[4] of the SPS service area that allows SPS to visualize and understand the wildfire risk level across the different regions of its service area. Figure 3 below depicts the wildfire threat levels within SPS's service area. The map depicts the threat level by tiers, with Tier 1 representing

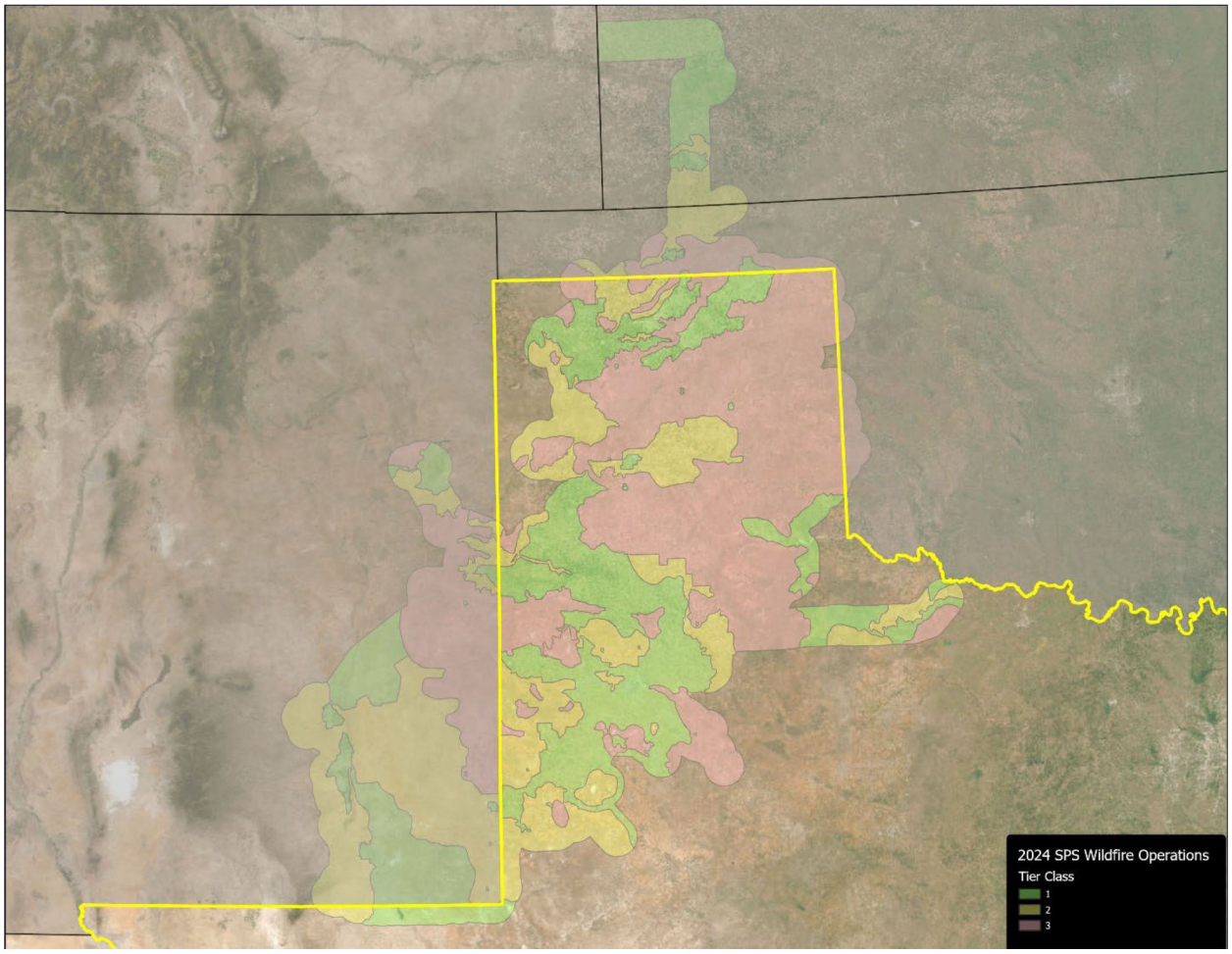
[2] Table 1 presents proposed SRP investments in 2024 dollars, as opposed to the SPS cost estimates presented in Attachment B, which are nominal values that include annual escalation over the three-year investment period. As explained by Mr. De Stigter, 1898 & Co.'s Resilience & Risk Investment Model uses present values to make an apples-to-apples comparison between the present costs of investments against the present value of their benefits over a 50-year expected life.

[3] The Communication Modernization investment enables the full effectiveness of the Mainline Automated Reclosing Deployment program. Section 6.2.4.1 of the 1898 & Co. Report shows a BCR of 4.3 for the mainline automation program. The combined BCR for Communication Modernization and Mainline Automated Reclosing Deployment is 1.8.

[4] In general, the terms Wildfire Risk Map and Wildfire Operations Map are used interchangeably in this SRP and direct testimony.

areas of low wildfire risk, Tier 2 representing areas of moderate wildfire risk, and Tier 3 representing areas of high wildfire risk.

Figure 3 – SPS Wildfire Risk Map



This analysis evaluates the landscape wildfire risk relative to populated areas and developed assets in SPS's service territory to assist SPS with the prioritization and operationalizing of wildfire risk mitigation efforts. This approach prioritizes system vulnerabilities and weather-based resiliency events with the highest likelihood of occurrence. For example, as shown in the 1898 & Co. Report, over 85 percent of the distribution overhead hardening and distribution system protection modernization measures will be focused on areas of SPS's system with the highest wildfire risk.

D. Programs and Measures

SPS's SRP is organized into five measures: (1) Distribution Overhead Hardening, (2) Distribution System Protection Modernization, (3) Communication Modernization, (4) Operational Flexibility, and (5) Wildfire Mitigation. Table 2 below shows the various programs and activities planned and the total budget that SPS has allocated to each measure. More detailed budget information is included in the program descriptions under each relevant measure in Section IV.

SPS ultimately selected the measures and programs proposed in this SRP based on several factors, including (1) mitigating the effects of resiliency events that impact the SPS System; (2) leveraging the BCR as reported by 1898 & Co., which incorporates the historical performance of feeders in the analysis; and (3) optimizing the overall size of the SRP, with consideration for the costs to customers and SPS's ability to execute on the full portfolio of proposed investments in years 2025-2028. SPS proposes to prioritize investments considering the wildfire risk in the area, as determined by the Wildfire Risk Map developed in coordination with EDM, and the BCR, as determined by 1898 & Co.'s analysis. The BCR values associated with projects are derived, in large part, from the historical performance of SPS's facilities during resiliency events.

The proposed measures in the Plan include new or expanded programs and activities to mitigate the effects of resiliency events that pose a material risk to the safe and reliable operation of the SPS System and are distinguishable from existing programs and activities. A summary of the activities and programs within each measure, the resiliency events to be mitigated by each proposed measure, and the estimated capital investment and O&M expenses for each measure is presented in Attachment B ("Summary Table").

E. Expected Benefits and Proposed Metrics

SPS engaged 1898 & Co. to analyze and quantify the expected benefits of certain of the resiliency measures proposed in this SRP, which are described in greater detail in the 1898 & Co. Report (attached hereto as Attachment A). 1898 & Co. used a resilience and risk-based planning approach to identify and prioritize distribution system resiliency investments utilizing an Integrated Resilience & Risk Investment Model developed by 1898 & Co. 1898 & Co. performed the resiliency benefit-cost analysis for resilience investment activities and estimated their

quantifiable benefits for the following SPS measures: (1) Distribution Overhead Hardening; (2) Distribution System Protection Modernization; and (3) Communication Modernization. SPS's Plan also includes Operational Flexibility and Wildfire Mitigation measures, which were not evaluated by 1898 & Co. but are addressed in other parts of SPS's filing.

The Distribution Overhead Hardening measure is designed to mitigate resiliency events that pose a risk to infrastructure structural vulnerabilities, including wind, tornado, and winter events. Hardened facilities will provide significant improvement for customers as hardened facilities will fail less frequently, allowing crews to restore the system more quickly. Quantified benefits for the measure are shown in terms of avoided restoration costs and from avoided customer outages.

The Distribution System Protection Modernization measure includes investment to minimize the impact of disruptive weather-based events. Distribution System Protection Modernization changes the number of customers impacted by the same infrastructure failures and leads to a benefit of reduced or avoided customer outages. Specifically, (a) it provides additional sectionalization of circuit mainlines so that fewer customers experience an outage when an event occurs on the circuit mainline; (b) automated feeder transfer schemes minimize customer downtime during disruptive events; and (c) lateral reclosers avoid sustained outages from nuisance events. The measure also will mitigate the risks to both structural and electrical vulnerabilities on the system.

The Communication Modernization measure will modernize the grid and integrate operational technology and information technology to decrease customer outages and manage other system risks. SPS will make investments in communications systems to enable communication between devices to enable remote device operations. This measure will support future capabilities of the Distribution System Protection Modernization measure; therefore, it indirectly supports mitigation of the same weather events that are mitigated by that measure. The Communication Modernization measure will allow the Automated Recloser Deployment program within the Distribution System Protection Modernization measure to be more effective at minimizing outages for customers and managing other system risks.

The Operational Flexibility measure includes (a) the acquisition of additional mobile substations that will allow SPS to quickly restore service when a substation transformer is damaged or destroyed by a resiliency event and to maintain continuity of service during the substation upgrades proposed in the SRP and (b) the installation of new automated transmission switches that will enhance SPS's ability to sectionalize the transmission system, reducing the frequency and duration of outages and the impact of outages on SPS's wholesale and end-use customers.

Finally, the specific Wildfire Mitigation measure includes both (a) Situational Awareness investments, like AI cameras and wildfire modeling tools to more effectively detect and predict wildfire threats, and (b) Physical Mitigations programs, like increased defensible space around poles and detailed visual inspections that will reduce the likelihood of SPS's infrastructure igniting a catastrophic wildfire. Along with other resiliency investments in the SRP, these programs will help create a safer environment for communities across the SPS service area by reducing the likelihood of fire ignition, protecting SPS's facilities from wildfire damage.

In addition to simply projecting benefits from the investment, the Resiliency Rule requires that each measure include a proposed metric or criteria for evaluating the effectiveness of the measure. SPS proposes metrics that apply to various measures in its SRP, as summarized below.

Table 2 –Metrics for Evaluating Effectiveness					
Metric	**Distribution Overhead Hardening**	**Distribution System Protection Modernization**	**Communication Modernization**	**Operational Flexibility**	**Wildfire Mitigation**
Underperforming Area Count	X	X	X		
Rolling 10-Year Average SAIDI	X	X	X	X	
Storm Restoration Duration	X	X	X		
Average Hardened Protection Zone (AHPZ) CI vs Average Protection Zone (APZ) CI Comparison by County (Hardened Only)	X				
AHPZ CI Percentage Improvement	X				
RAN Tower Completion			X		
End Device Connectivity			X		
Units Completed in DSAP					X
Transmission Inspections					X

These metrics are intended to capture performance improvements from SPS's proposed investments in this Plan, specifically showing how the impacts from severe weather events over time are lessened due to the hardening investments and protection modernization. Additionally, they will capture how SPS's investments in wildfire mitigation are reducing the impacts of fires on our system.

In sum, the SRP is a comprehensive and evidence-based plan developed in collaboration with third-party experts to address the specific needs of our customers, given the unique

characteristics of SPS's Texas service area. The Plan utilizes decades of quantitative, qualitative, and historical data to prioritize risks by events and geography and recommends targeted investments to reduce the impact of severe weather events and wildfire. The analysis from third-party consultants 1898 & Co. and EDM supports the conclusion that these investments are cost-beneficial and in the public interest.

The remainder of this Plan is organized as follows:

- Section II discusses the resiliency events addressed by the SRP;
- Section III discusses SPS's approach to improving system resiliency, including the work performed by 1898 & Co. and EDM;
- Section IV discusses SPS's proposed resiliency measures in this Plan; and
- Section V discusses SPS's proposed metrics for evaluating the effectiveness of its Plan.

II. DESCRIPTION OF RESILIENCY EVENTS AND RISKS ADDRESSED BY THE SRP

The Resiliency Rule requires that a resiliency plan "define, identify, and describe each type of resiliency event and any associated resiliency-related risks the plan is designed to prevent, withstand, mitigate, or more promptly recover from."[5]

SPS's service area is affected by weather-based resiliency events as well as wildfire. SPS and other public utilities are also increasingly facing cybersecurity resiliency events. This Plan includes measures designed to prevent, withstand, mitigate, or more promptly recover from risks posed by each of these events. To understand the weather-based events affecting the resiliency of its system, SPS worked with 1898 & Co. to analyze historic weather data. EDM provided an analysis of historic wildfire data.

A. Weather-Based Resiliency Events Addressed in SRP

1. Weather-Based Resiliency Events in SPS's Service Area

SPS's service area faces numerous types of significant, impactful extreme weather events that can cause forced outages on SPS equipment. These include: (1) Wind, (2) Flooding, (3) Tornado, (4) Winter, (5) Heat, and (6) Cold. SPS engaged 1898 & Co. to comprehensively evaluate the types of extreme weather events that impact the SPS service area. 1898 & Co. began its evaluation by consulting the National Oceanic and Atmospheric Administration ("NOAA") database of non-named weather-based events dating back to 1998 to identify the extreme weather events that have historically impacted the SPS service area and the frequency of those impacts. The NOAA database records events at the county or sub-county level, which allowed 1898 & Co. to collect data on how each type of weather event impacted specific locations in SPS's service area over time. 1898 & Co. identified 21 types of extreme weather events that pose resiliency risks to SPS's service area, divided among seven event categories.

[5] 16 TAC § 25.62(c)(2)(B).

Table 3 below identifies the weather-based resiliency events that pose risks to the SPS service area.

Table 3: Weather-Based Resiliency Events in SPS Service Area

Extreme Weather	
Wind	11. Sleet
1. Thunderstorm Wind	12. Winter Storm
2. Lightning	13. Heavy Snow
3. Hail-Wind	14. Ice Storm
4. High Wind	15. Hail-Winter
5. Strong Wind	16. Blizzard
Flood	**Heat**
6. Flood	17. Heat
7. Heavy Rain	18. Excessive Heat
8. Flash Flood	**Drought**
Tornado	19. Drought
9. Tornado	**Cold**
Winter	20. Cold/Wind Chill
10. Winter Weather	21. Extreme Cold/Wind Chill

Table 4 below defines each of the weather-based resiliency events. These definitions are taken from NOAA's storm data preparation guidelines.

Table 4: Extreme Weather Resiliency Events[6]

No.	Resiliency Event Category	Resiliency Event Type	Definition
1	Wind	Thunderstorm Wind	Winds, arising from convection (occurring within 30 minutes of lightning being observed or detected), with speeds of at least 50 knots (58 mph), or winds of any speed (non-severe thunderstorm winds below 50 knots) producing a fatality, injury, or damage.

[6] *National Weather Service Instruction 10-1605* (July 26, 2021), *available at* https://www.weather.gov/media/directives/010_pdfs/pd01016005curr.pdf.

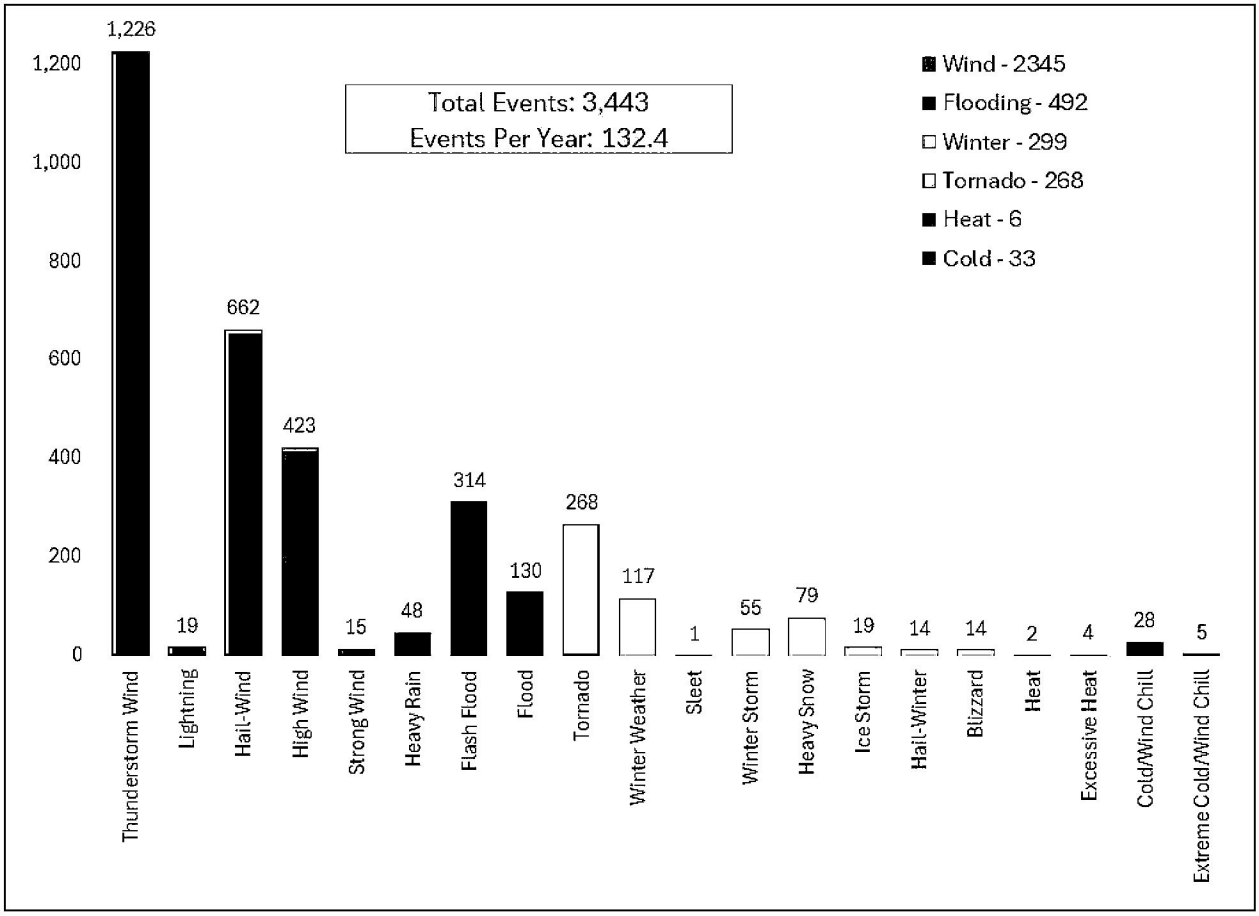
2		Lightning	A sudden electrical discharge from a thunderstorm, resulting in a fatality, injury, and/or damage.
3		Hail-Wind	Hail is defined as, Frozen precipitation in the form of balls or irregular lumps of ice. Hail of any size may be reported, in hundredths of an inch, although the smallest measure in the hail conversion table is 0.25 inches. This report uses "Hail-Wind" to refer to hail that occurs not in connection with a winter-weather event and not during the months of December, January, and February.
4		High Wind	Sustained non-convective winds of 35 knots (40 mph) or greater lasting for 1 hour or longer, or gusts of 50 knots (58 mph) or greater for any duration (or otherwise locally/regionally defined).
5		Strong Wind	Non-convective winds gusting less than 50 knots (58 mph), or sustained winds less than 35 knots (40 mph), resulting in a fatality, injury, or damage.
6	Flood	Flood	Any high flow, overflow, or inundation by water which causes damage.
7		Heavy Rain	Unusually large amount of rain which does not cause a Flash Flood or Flood event, but causes damage, e.g., roof collapse or other human/economic impact.
8		Flash Flood	A life-threatening, rapid rise of water into a normally dry area beginning within minutes to multiple hours of the causative event (e.g., intense rainfall, dam failure, ice jam). Six inches or more of swiftly moving water flowing over a road or bridge, posing a threat to life or property is one of many suggested guidelines for determining if an event was a Flash Flood.
9	Tornado	Tornado	A violently rotating column of air, extending to or from a cumuliform cloud or underneath a cumuliform cloud, to the ground, and often (but not always) visible as a condensation funnel.
10	Winter	Winter Weather	A winter precipitation event that causes a death, injury, or a significant impact to commerce or transportation, but does not meet locally/regionally defined warning criteria. A Winter Weather event could result from one or more winter precipitation types (snow, or blowing/drifting snow, or freezing rain/drizzle).
11		Sleet	Sleet accumulations meeting or exceeding locally/regionally defined warning criteria (typical value is ½ inch or more). Per the National Weather Service, 27 the Southern Region weather criteria for sleet in the State of Texas is ½ inch or more.
12		Winter Storm	A winter weather event that has more than one significant hazard (i.e., heavy snow and blowing snow; snow and ice; snow and sleet; sleet and ice; or snow, sleet and ice) and meets or exceeds locally/regionally defined 12 and/or 24-hour warning criteria for at least one of the precipitation elements.
13		Heavy Snow	Snow accumulation meeting or exceeding locally/regionally defined 12 and/or 24 hour warning criteria. This could mean values such as 4, 6, or 8 inches or more in less than 12 hours or less; or 6, 8, or 10 inches in 24 hours or less. Heavy snow criteria range from 1 inch per event in the southernmost portions of Texas to 4 inches in 12 hours and 6 inches in 24 hours in the northernmost portions.
14		Ice Storm	Ice accretion meeting or exceeding locally/regionally defined warning criteria (typical value is ¼ or ½ inch or more)." The ice accumulation criteria for the southern portion of Texas is 1/8 or more, while the criteria is ¼ inch or more throughout the remainder of the state.

15		Hail-Winter	Hail is defined as, Frozen precipitation in the form of balls or irregular lumps of ice. Hail of any size may be reported, in hundredths of an inch, although the smallest measure in the hail conversion table is 0.25 inches. This report uses "Hail-Winter" to refer to hail that occurs in connection with a winter-weather event, and/or during the months of December, January, and February.
16		Blizzard	A winter storm which produces the following conditions for three (3) consecutive hours or longer: (1) sustained winds or frequent gusts of 30 knots (35 mph) or greater, and (2) falling and/or blowing snow reducing visibility frequently to less than ¼ mile.
17	Heat	Heat	A period of heat resulting from the combination of high temperatures (above normal) and relative humidity. A Heat event occurs and is reported in Storm Data whenever heat index values meet or exceed locally/regionally established advisory thresholds. Heat advisory thresholds range from heat index/temperature levels of 100°F and above to heat index/temperature levels of 110°F and above in Texas.
18		Excessive Heat	Excessive Heat results from a combination of high temperatures (well above normal) and high humidity. An Excessive Heat event occurs and is reported in Storm Data whenever heat index values exceed locally/regionally established excessive heat warning thresholds. Excessive heat warning thresholds range from heat index/temperature levels of 105°F and above to heat index/temperature levels of 115°F and above in Texas.
19	Drought	Drought	Drought is a deficiency of moisture that results in adverse impacts on people, animals, or vegetation over a sizeable area.
20	Cold	Cold/Wind Chill	Period of low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined advisory (typical value is -18°F or colder) conditions.
21		Extreme Cold/Wind Chill	A period of extremely low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined warning criteria (typical value around -35°F or colder).

The NOAA event data shows that 3,443 weather-based resiliency events occurred in SPS's service area from 1998 through 2023, the most recent year for which data is available.[7] Figure 4 below shows the number of occurrences in SPS's service area since 1998, broken down by event type. The most frequent events are Thunderstorm Wind, Hail-Wind, High-Wind, Flash Flood, and Tornado.

[7] 1898 & Co. did not evaluate drought events because their durations are so long that they are difficult to correlate to an outage.

Figure 4: Extreme Weather Events in SPS's Service Area Since 1998



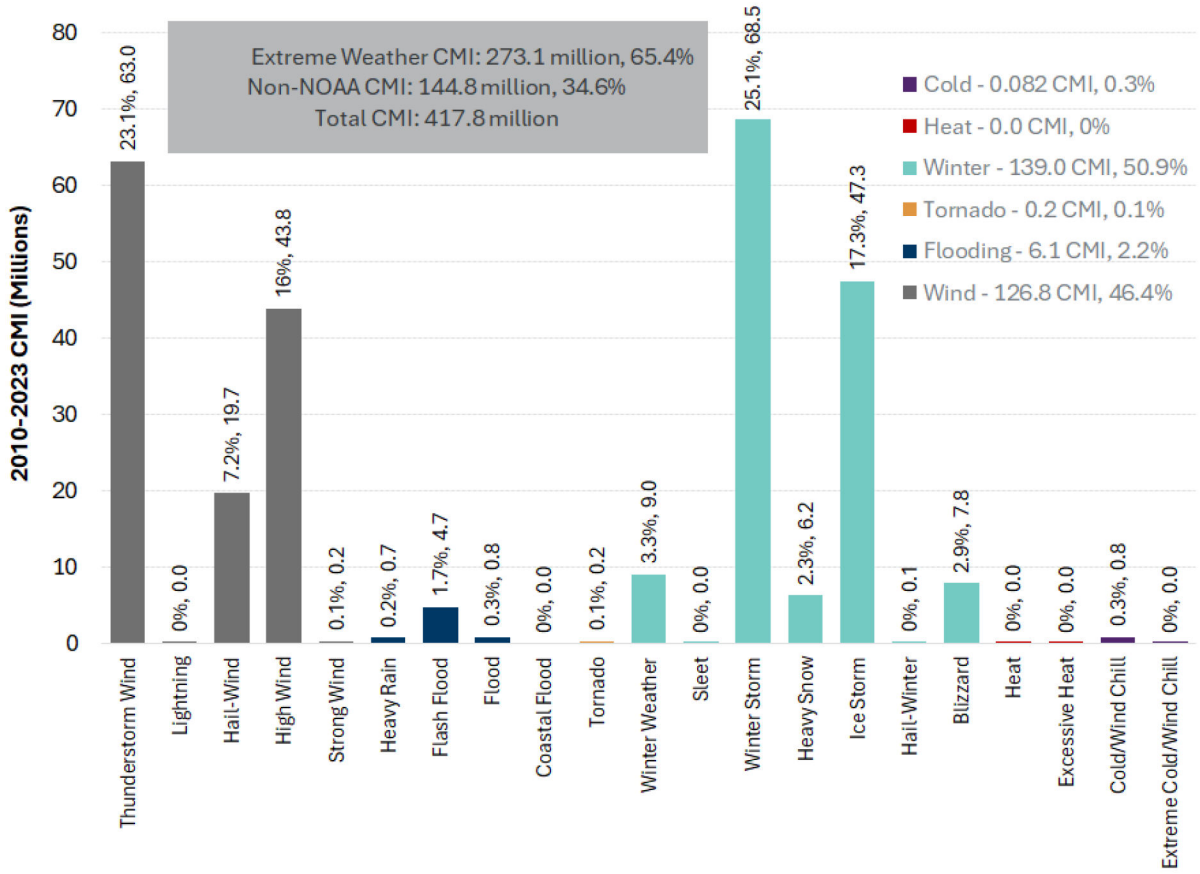
2. Risks Posed by Weather-Based Resiliency Events

The weather-based resiliency events identified by 1898 & Co. pose a number of risks to the SPS system that can result in customer outages. For example, Wind events can cause conductor contact and blow vegetation, debris, or other objects into energized facilities. Wind events can cause structural overloads, potentially toppling poles, snapping conductor, or directly damaging appurtenant equipment. They can also cause galloping conductor when combined with ice or snow. Winter events can cause structural overloads as ice accumulates on facilities and surrounding vegetation. They can also significantly delay restoration efforts, prolonging outages for customers. Heat and Cold events are often accompanied by increased power usage, which can cause thermal overloads on SPS equipment and limit the system capacity available for load transfers, further limiting SPS's ability to restore service. Flood events often have localized impacts that restrict access to structures during an outage event. Approximately 41 percent of the poles on the SPS

system have limited accessibility following heavy rain events. Tornado events, including the surrounding winds that accompany tornados, can also destroy poles, conductor, and other equipment located in their paths.

To quantify the risks that weather-based resiliency events pose to the SPS system, 1898 & Co. correlated the weather-based resiliency events in the NOAA data with outages recorded in SPS's Outage Management System ("OMS"), which data dates to 2010. 1898 & Co. identified over 1,924 NOAA events during which an outage was recorded on SPS's system. 1898 & Co. used data from the OMS to determine the number of Customer Minutes Interrupted ("CMI"), or the total number of minutes that SPS customers collectively were without service during an outage, associated with each resiliency event. 1898 & Co.'s correlation analysis shows that approximately 65.4 percent of all outage minutes recorded since 2010—over 273 million CMI occurred during a weather-based resiliency event. Of those events, Winter Storm, Thunderstorm Wind, Ice Storm, High Wind, and Hail-Wind events had the greatest customer impact, as measured in CMI. In other words, a substantial majority of the customer outages on the SPS system were associated with weather-based resiliency events, and Wind and Winter events were responsible for over 90 percent of those outages. Figure 5 below shows the CMI associated with each type of weather-based resiliency event from 2010 to 2023.

Figure 5: CMI Mapped to NOAA Events (2010-2023)



Finally, 1898 & Co. used the frequency and outage data from NOAA and SPS's OMS data to rank the weather-based resiliency events based on their annual average CMI per event. The ranking shows that Wind and Winter events make up the eight most impactful event types on the SPS System. While Winter events occur less frequently than many other events, they cause a significant number of customer outages when they do occur. Wind events are responsible for a similar amount of CMI compared to Winter events, but they occur much more frequently, so their impacts are spread over a greater number of events. This ranking helped SPS to prioritize the weather-based resiliency events based on their overall customer impact, which guided SPS's selection of the measures and programs to include in the Plan, as described in more detail in Section III. This analysis of weather-based resiliency events allowed SPS to tailor this Plan to prevent, withstand, mitigate, and more promptly recover from the resiliency events with the greatest impact to the SPS service area and its customers.

Table 5: Prioritization of Resiliency Events

No.	Event Category	Event Type	1998 – 2023 Avg Events / Year	Annual Average CMI	Event Frequency Rank	Event Impact Rank
1	Winter	Winter Storm	2.12	68,545,688	9	1
2	Wind	Thunderstorm Wind	47.15	62,993,196	1	2
3	Winter	Ice Storm	0.73	47,320,875	12	3
4	Wind	High Wind	16.27	43,781,368	3	4
5	Wind	Hail-Wind	25.46	19,724,513	2	5
6	Winter	Winter Weather	4.50	8,988,880	7	6
7	Winter	Blizzard	0.54	7,813,848	15	7
8	Winter	Heavy Snow	3.04	6,232,480	8	8
9	Flooding	Flash Flood	12.08	4,664,246	4	9
10	Cold	Cold/Wind Chill	1.08	816,310	11	10
11	Flooding	Flood	5.00	794,983	6	11
12	Flooding	Heavy Rain	1.85	680,936	10	12
13	Tornado	Tornado	10.31	246,922	5	13
14	Wind	Strong Wind	0.58	246,510	14	14
15	Winter	Hail-Winter	0.54	130,885	15	15
16	Wind	Lightning	0.73	35,559	12	16
17	Heat	Heat	0.08	32,855	19	17
18	Winter	Sleet	0.04	13,068	20	18
19	Heat	Excessive Heat	0.15	9,591	18	19
20	Cold	Extreme Cold/Wind Chill	0.19	6,307	17	20
21	Drought	Drought	Not Quantified – Data Not Available to estimate equipment failures and customer outages			

B. Wildfire Risk

Catastrophic wildfires can be devastating to communities and the environment and have become a matter of national priority for utilities, government agencies, legislators, regulators,

customers, investors, ratings agencies, insurers, and other stakeholders. The growing threats from an increased frequency of fire weather conditions, aging infrastructure, and increased development in wildland areas have made preventing wildfires, mitigating ignition risks, and protecting facilities a significant priority for utilities operating in portions of the U.S., including Texas. Wildfire presents a clear and present danger to the safety, reliability, and resiliency of utility systems and the communities served by these facilities. The 2024 Texas Panhandle wildfires are indicative of these conditions and threats.

Understanding the wildfire risk relative to SPS's assets is fundamental to SPS's wildfire prevention and protection efforts. Wildfire risk varies across SPS's geographic service territory. The risk at any given location depends on the fuels, terrain, fire behavior patterns, prevailing weather patterns, proximity of developed areas, and other factors.

Below are general descriptions of Texas wildfire history and characteristics, the increased frequency of wildfire weather conditions and acres burned by wildfires in Texas and the U.S., and recent challenges experienced during wildfire resiliency events in and around SPS's service area.

1. Texas Wildfire Overview

All of the largest wildfires recorded in Texas history have occurred since 1988. Five of the fifteen largest wildfires in Texas history have occurred in, or very near, SPS's service territory.[8] Ninety percent of the 30 largest wildfires in Texas have occurred between January and May, primarily in the grass-dominant Texas Plains. Factors that drive the dormant wildfire season in Texas are grass fuel loading produced during the previous growing season, drought conditions, and seasonal temperature and precipitation. Emerging drought following a wetter-than-normal growing season has produced the most active dormant fire seasons in past years.[9] Each year, the Texas A&M Forest Service and the National Weather Service watch for an extremely dangerous fire weather phenomena known as a Southern Plains Wildfire Outbreak ("SPWO"). The

[8] Historical Fire Statistics, Texas A&M Forest Service, *available at* https://fire-information-tfsgis.hub.arcgis.com/pages/historical-fire-statistics

[9] *2023 Texas Dormant Wildfire Season Expected to be Normal to Below Normal*, Texas A&M Forest Service, (Dec. 1, 2022), *available at* https://ticc.tamu.edu/Documents/PredictiveServices/Outlooks/2023_Dormant_Fire_Season_Outlook_Final.pdf.

environment conducive to a SPWO is characterized by dry vegetation, dry west-southwest winds across an area with low relative humidity, above average surface temperatures, an unstable atmosphere and clear, sunny skies. Historically, SPWO events happen more often during La Niña years. This is because La Niña conditions translate to warmer than normal, and drier than normal, conditions for Texas during the winter and spring months, thereby increasing the potential for high impact wildfire weather and SPWO events. An SPWO event is a force of nature, and much like a hurricane or tornado, it cannot be stopped. Since 2005, SPWO fires account for 3 percent of reported wildfires, but 49 percent of the acres burned.[10]

As winter months and freezing temperatures move in, the growing season ends and grasses cure, turn brown, and become dormant. During this phase, grasses are not actively growing, meaning they are not replenishing and maintaining their moisture levels as they do when they are green. Freeze-cured grasses dry out very quickly and are susceptible to ignition from any spark, which in turn could grow into a wildfire. Grass wildfires can spread very quickly and put residents and communities in the path of danger.[11] Once grass is dry it has a high probability of ignition during periods of low relative humidity and high winds. Depending upon grass height and continuity, a wildfire can grow to over 2,000 acres in size within one hour during periods of high winds. Flame lengths can reach upwards of 34 feet.[12] Wind-driven wildfires characterized by the fire behavior described above challenge even the most robust initial fire suppression attack. High winds also tend to limit the effectiveness of aerial firefighting resources and can cause them to be grounded.

2. Increased Frequency of Wildfire Weather Conditions

To better understand growing wildfire risks across the U.S., a recent national study analyzed historical trends in fire weather, including the analysis of weather data from 476 weather stations across 245 climate divisions during a 50-year period between 1973 and 2022. The study defined fire weather as a combination of three meteorological conditions (i.e., high sustained wind

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[10] *Preparing for Wildfires, Southern Plains Wildfire Outbreak,* Texas A&M Forest Service, https://tfsweb.tamu.edu/spwo/.

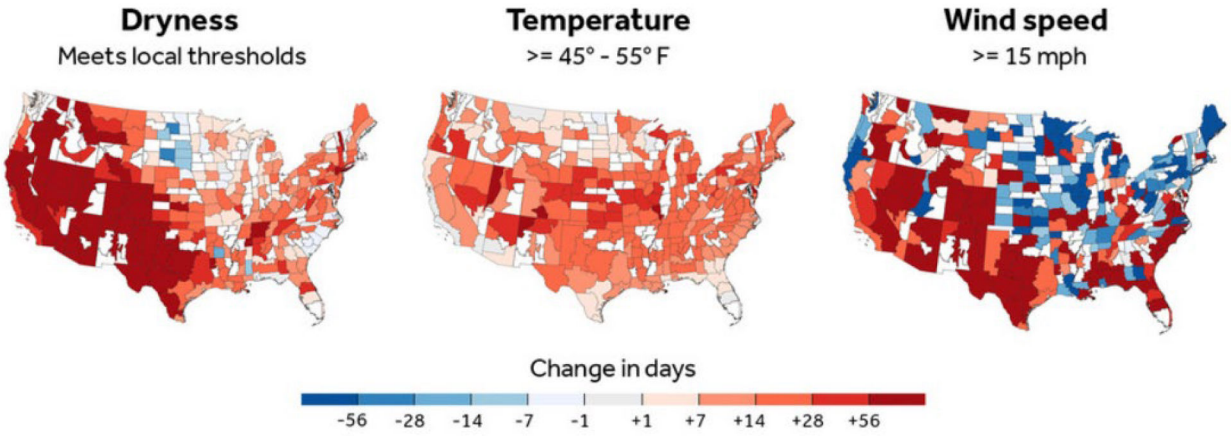
[11] *Id.*

[12] Behave Plus 6.0.0 is a fire behavior prediction and fuel modeling system, https://www.frames.gov/behave/home.

speeds, high ambient air temperatures, and low relative humidity) facilitative for the spread of wildfire. While wind speed, temperature, and humidity are the primary contributors to fire behavior, spread, and suppression difficulty, other environmental factors such as fuel types, fuel densities, and topography can also impact wildfire risk and danger.[13] Figure 6 below depicts the change in average fire weather days from 1973 to 2022, on which the aforementioned three fire weather conditions met or exceeded their corresponding thresholds in each climate division.

Figure 6 – Average Annual Change in the Number of Days on which Each of The Three Critical Fire Weather Meteorological Conditions Thresholds were Met or Exceeded

(1973-2022)

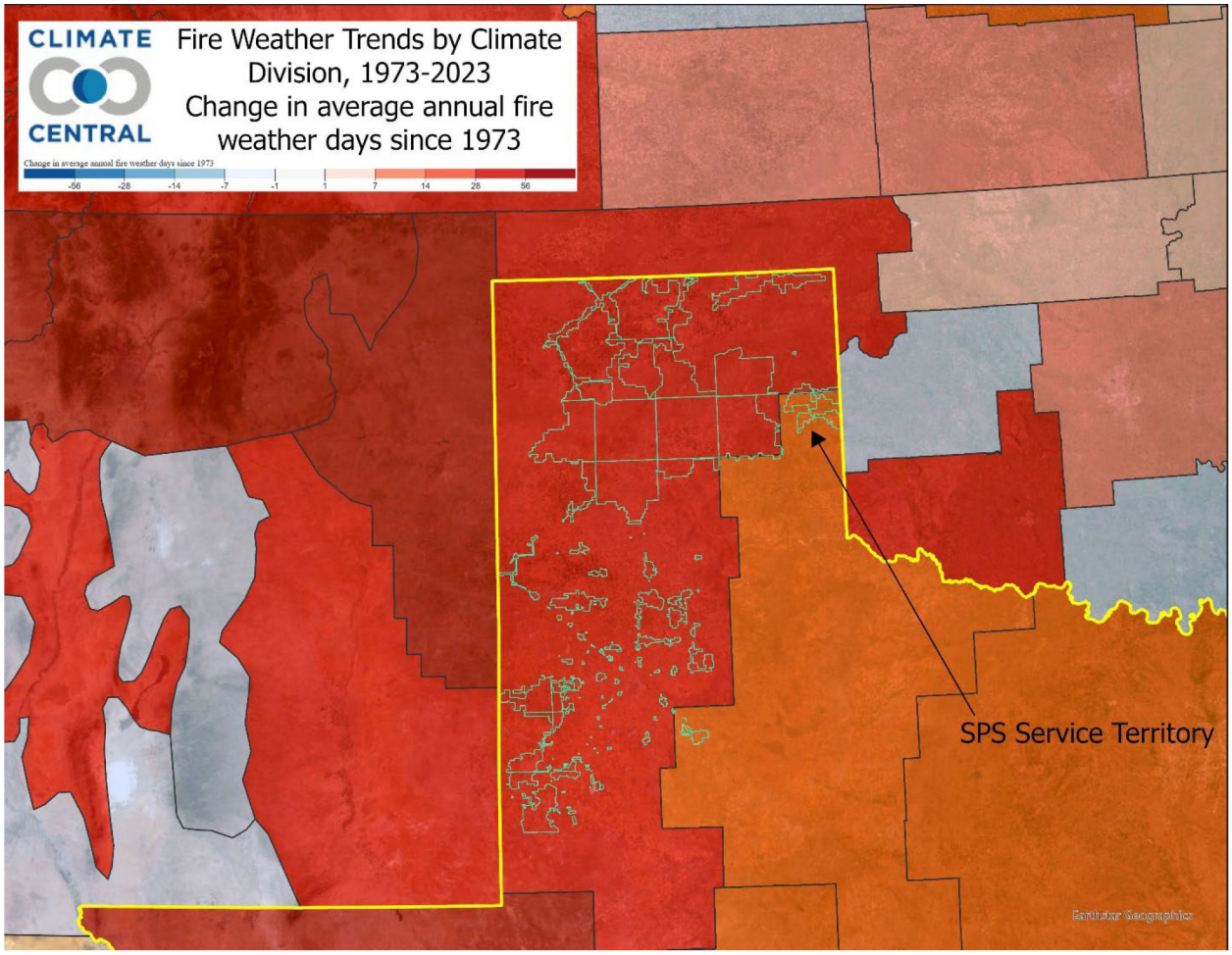


The study concluded that Texas has experienced some of the greatest increases in the average number of annual fire weather days since 1973, with some Texas climate divisions now experiencing approximately two more months of fire weather or more than twice the number of fire weather days now compared to 50 years ago. Figure 7 below depicts the change in average annual fire weather days since 1973 specific to the climate regions in and around SPS's Texas service area.[14]

[13] Wildfire Weather: Analyzing the 50-year shift across America, Climate Central at 3 (May 2023), https://assets.ctfassets.net/cxgxgstp8r5d/1RwlNCKT1zYQFz5NtKW9ue/9a843df6ca96446b1f507a1acabfe0bc/FINAL-Fire_Weather_2023__EN_.pdf.

[14] Wildfire Weather: Analyzing the 50-year shift across America, Climate Central at 6 (May 2023), https://assets.ctfassets.net/cxgxgstp8r5d/1RwlNCKT1zYQFz5NtKW9ue/9a843df6ca96446b1f507a1acabfe0bc/FINAL-Fire_Weather_2023__EN_.pdf.

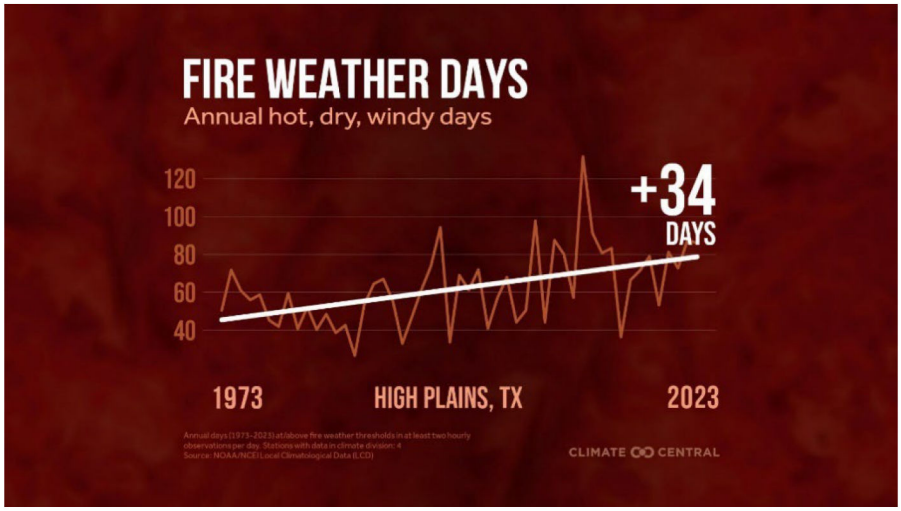
Figure 7 – Change in Annual Number of Fire Weather Days (1973-2022) for Climate Divisions in SPS's Texas Service Area



SPS's service area is completely encompassed by areas experiencing significantly increased wildfire risk over the last 50 years. SPS's service area is located in the High Plains and Low Rolling Plains climate divisions as identified by NOAA's National Centers for Environmental Information. The study identified High Plains, Texas as one of the top 20 national locations with the greatest change in fire weather days during the analysis period with an average increase of 34 annual fire weather days (see Figure 8).[15]

[15] Data used to create the below graphic can be accessed here: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fclimatecentral-web-assets.s3.amazonaws.com%2F2024FireWeather%2F2024FireWeather_DataDownload.xlsx&wdOrigin=BROWSELINK.

Figure 8 – Change in Annual Number of Fire Weather Days in the High Plains, Texas Climate Division (1973-2022)



Low Rolling Plains, Texas was in the top 30 locations experiencing an average annual increase of 20 fire weather days (see Figure 9).[16]

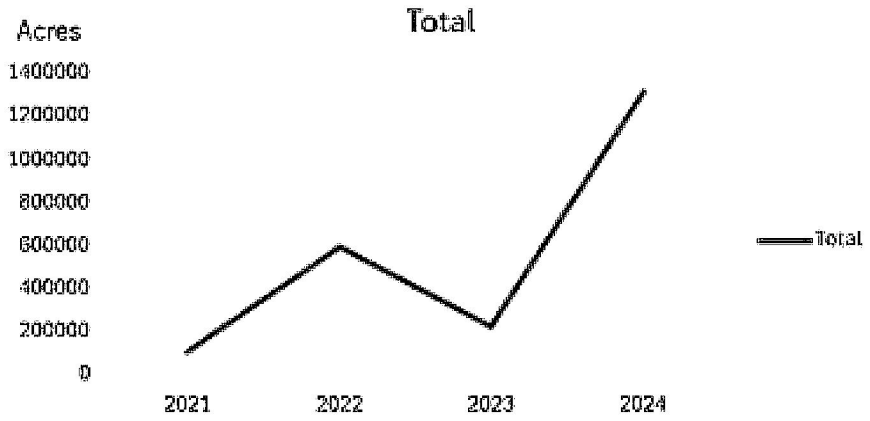
Figure 9 – Change in Annual Number of Fire Weather Days in the Low Rolling Plains, Texas Climate Division (1973-2022)

[16] *Id.*

3. Increased Acreages Burned and Frequency of Wildfire Occurrences

A study of recent historical Texas wildfire data indicates a significant increase in the number of acres burned over the previous four years, as depicted in Figure 10.[17]

Figure 10 – Acres Burned in Texas Wildfires (2021 – Year-to-Date 2024)



These data are consistent with other national data that show an upward trend in the number of acres burned by wildland fires across the U.S. Figure 11 below depicts data from the National Interagency Fire Center ("NIFC"). The trendline shows a significant increase in the total number of acres burned in the U.S. in recent decades.[18] Compared to recent years, the U.S. experienced a significant decrease in acres burned in 2023; however, there is a significant increase of acres burned in 2024. For the period between January 1 and December 13, 2024, wildland fires burned 8,509,953 acres. This is approximately two million acres above the 10-year average year-to-date number of acres burned.[19]

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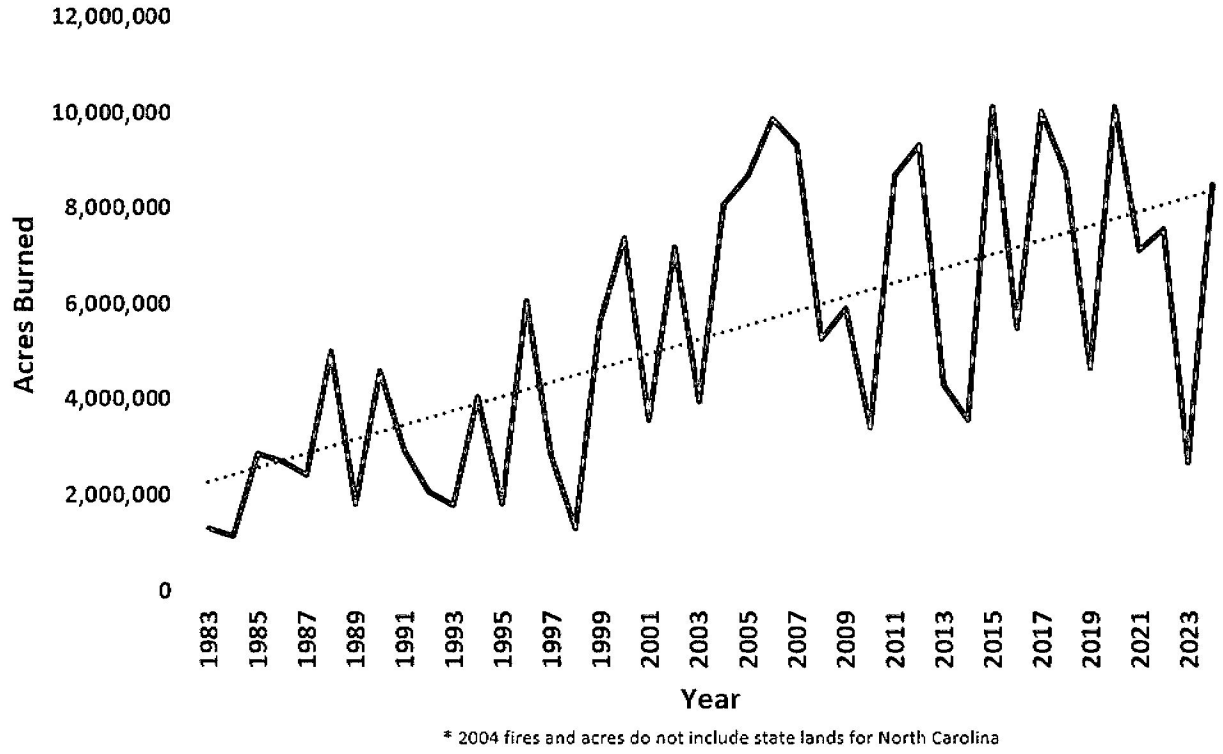
[17] The graph below was created by using the data from the following website: https://services3.arcgis.com/T4QMspbfLg3qTGWY/arcgis/rest/services/WFIGS_Interagency_Perimeters/FeatureServer/0.

[18] *Wildfires and Acres*, National Interagency Fire Center (2023), https://www.nifc.gov/fire-information/statistics/wildfires

[19] *National Fire News*, National Interagency Fire Center (December 2024), *available at* https://www.nifc.gov/fire-information/nfn.

Figure 11 – Annual Number of Acres Burned in U.S. Wildland Fires

(1983 – Year-to-Date 2024)



As extreme weather conditions become more frequent, SPS can expect more frequent and disruptive wildfire events.[20] In their Potential Impacts of Climate Change on U.S. Wildfire Risk by Mid Century of Sept 2021, the Society of Actuaries Research Institute predicts that the Texas Panhandle will experience a 120 percent to 250 percent increase in mean annual acres burned, and a 90 percent to 120 percent increase in the mean number of wildfires.[21] Improved situational awareness, grid hardening, and other pre-planning will help reduce the negative impacts to SPS customers and stakeholders from these kinds of resiliency events.

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[20] Alexandra Hart, *More Frequent – and Worsening – Extreme Weather Events are Ahead for Texas*, Texas Standard, (April 25, 2024), *available at* https://www.texasstandard.org/stories/more-frequent-and-worsening-extreme-weather-events-are-ahead-for-texas/.

[21] *Potential Impacts of Climate Change on U.S. Wildfire Risk by Mid Century*, SOA Research Institute, (September 2021), https://www.soa.org/4a8096/globalassets/assets/files/resources/research-report/2021/climate-change-impacts-to-us-wildfire-risk.pdf.

4. Recent Wildfire Resiliency Events and Subsequent Wildfire Risk

The Smokehouse Creek Fire, the single largest wildfire in Texas history, and the Grape Vine Creek, Windy Deuce, and Reamer Creek fires are all indicative of recent utility-related wildfire resiliency events.[22] Collectively, these wildfires burned over one million acres across the Texas Panhandle and Oklahoma in February 2024. Challenges that hindered response times and firefighting efforts were identified in the aftermath of the fires, including a lack of readily available fire-suppression air support, partially ineffectual agency and first-responder communication and coordination, and faulty equipment and infrastructure.[23] The Texas Panhandle fires reinforce the need for SPS's enhanced wildfire prevention and protection programs to increase the safety and resiliency of the electric system for the communities SPS serves. SPS's Wildfire Mitigation measure and its supporting programs are designed to help address and mitigate some of these aforementioned challenges.

It is important to note that landscape wildfire risk persists in the aftermath of the Texas Panhandle fires. The predominant fuels in the region are finer fuels such as grasses and small woody shrubs. Native grasses usually survive wildfires. When a fire sweeps through, it takes the dead plant material from the surface, but grass grows back quickly because most of the plant is below ground and escapes long-term damage. The key to grass growth is the amount of rainfall, not whether there has been a wildfire. Moreover, a fire can improve the quality of the forage by clearing out old vegetation and allowing for increased growth of grass types with more protein.[24]

C. Cybersecurity Risks

Cybersecurity is a top priority for SPS. One of SPS's long-term strategic objectives is to modernize its electric facilities and equipment by deploying upgraded information technology ("IT"), operational technology ("OT"), and communications devices and applications. Upgrading aging, analog devices on the SPS system with modern digital and communications-enabled

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[22] *Investigative Committee on the Panhandle Wildfires*, Texas House of Representatives at 15 (May 1, 2024), *available at* https://www.house.texas.gov/pdfs/committees/reports/interim/88interim/House-Interim-Committee-on-The-Panhandle-Wildfires-Report.pdf

[23] *Id.*

[24] *Rangeland Grasses Recover Quickly After Fire*, United Stats Department of Agriculture, *available at* https://agresearchmag.ars.usda.gov/2017/sep/grasses/.

replacements can provide value to SPS's customers, make the SPS system more reliable, and increase customer engagement. For example, in 2022, the Commission approved SPS's deployment of an Advanced Metering System, which allows SPS to collect more granular data and exercise more precise control over retail delivery systems and operations.[25] Similarly, in this Plan, SPS proposes to deploy hundreds of communications-enabled protective devices that require reliable, secure network communications to automate switching operations, transfer customer load, enable remote control of device settings, and allow SPS to remotely monitor system conditions. While these enhancements present promising opportunities, they are accompanied by new vulnerabilities that must be carefully managed.

The electric grid is critical infrastructure that is vital to the U.S. economy.[26] As such, it presents an attractive target for bad actors seeking to exploit vulnerabilities for political or financial purposes.[27] The proliferation of connected devices on the electric grid increases SPS's reliance on communications infrastructure outside its control, which in turn increases the potential attack surface for cyber-attacks.[28] In January 2024, the U.S. Department of Energy expressly acknowledged the importance of this threat, defining cyber-resilience for critical energy infrastructure as one of the five pillars of its Cybersecurity Strategy.[29]

Recent events validate concerns regarding the risk of cyber-attacks on electric utility infrastructure. In September, Reuters reported that cyber-attacks targeting U.S. utilities surged 70

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[25] *Application of Southwestern Public Service Company for Approval of Advanced Metering System (AMS) Deployment Plan, AMS Surcharge, and Non-Standard Metering Service Fees*, Docket No. 52451, Order (Jul. 14, 2022).

[26] U.S. Department of Energy-Office of Electricity, *Communications in the Electric Grid* at 3 (Nov. 2023), *available at* https://www.energy.gov/sites/default/files/2023-11/Communications_in_the_Electric_Grid_An_Evolving_%20Interdependent_Ecosystem_between_the_Grid_and_Communications_Utilities-r1.pdf

[27] *Id.*

[28] *Id.*

[29] *U.S. Department of Energy Cybersecurity Strategy* at 7-8 (Jan. 2024), *available at* https://www.energy.gov/cio/articles/doe-cybersecurity-strategy-2024.

percent in 2024.[30] This includes multiple attacks that caused operational issues for Texas public utilities serving over 2 million people. One such attack targeted utility systems in Hale Center and Muleshoe, both of which are located in SPS's service area.[31] SPS's extensive, and often remote, critical infrastructure can make SPS systems a particularly attractive target for cyber-attacks.

Documented cybersecurity breaches like the Colonial Pipeline event in 2021 illustrate how damaging cyber-attacks can be for critical infrastructure systems and markets. In 2021, Colonial Pipeline was forced to shut down one of the largest pipeline systems in the U.S., over 5,500 miles of pipeline, after hackers gained access to the Colonial Pipeline IT network, stole 100 gigabytes of data, and infected the network with ransomware that affected multiple computer systems. Colonial Pipeline was only able to regain control of the network after paying the hackers a multi-million-dollar ransom. By that time, the attack had resulted in widespread fuel shortages and a spike in gas prices.

In a 2021 congressional report, the National Academy of Sciences observed that stopping directed attacks targeting critical energy infrastructure will require "sophisticated, multifaceted defenses."[32] But grid operators often have limited control over cyber-security defenses for communications over public networks. For example, while SPS has a robust cybersecurity framework for OT/IT communications, it is completely reliant on public carriers to secure communications transmitted through a public cellular network. SPS's data is not prioritized on these networks, and SPS has no ability to monitor the communications once they are transmitted to the public network. This creates a potential vulnerability in SPS's cybersecurity defenses that could be exploited by bad actors.

In November 2024, the Federal Bureau of Investigation ("FBI") and Cybersecurity & Infrastructure Security Agency ("CISA") warned that state-sponsored hackers had for months

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[30] *See Cyberattacks on US Utilities Surged 70% This Year, Says Check Point*, Reuters (Sep. 11, 2024), *available at* https://www.reuters.com/technology/cybersecurity/cyberattacks-us-utilities-surged-70-this-year-says-check-point-2024-09-11/.

[31] *Rural Texas Towns Report Cyberattacks that Caused One Water System to Overflow*, Texas Tribune (Apr. 19, 2024), *available at* https://www.texastribune.org/2024/04/19/texas-cyberattacks-russia/.

[32] National Academy of Sciences, *The Future of Electric Power in the United States* at 225 (2021), *available at* http://nap.nationalacademies.org/25968

infiltrated public cellular networks and other telecommunications infrastructure, placing user data at risk of interception or alteration.[33] CISA issued another statement on December 18, 2024, warning that all "highly targeted individuals should assume that all communications between mobile devices" are at risk. As explained above, public utility infrastructure is increasingly being targeted by cyber-attacks in an effort to disrupt the operation of critical infrastructure. An attack targeting SPS's OT/IT communications could potentially disrupt service for thousands of SPS customers. Accordingly, this Plan includes investments to mitigate the risks that cybersecurity threats pose to SPS, its systems, and its customers.

[33] *See Joint Statement from FBI and CISA on the People's Republic of China (PRC) Targeting of Commercial Telecommunications Infrastructure* (Nov. 4, 2024), *available at* https://www.cisa.gov/news-events/news/joint-statement-fbi-and-cisa-peoples-republic-china-prc-targeting-commercial-telecommunications.

III. SPS'S APPROACH TO IMPROVING SYSTEM RESILIENCY

A. Measure Selection

1898 & Co. assisted SPS in the selection, design, and scoping of the proposed measures. As described in more detail in the 1898 & Co. report, included as Attachment A, 1898 & Co. used the Integrated Resilience and Risk Investment Model to evaluate the effectiveness and quantify the expected benefits for potential resiliency investments included in their evaluation. For each investment activity, 1898 & Co. calculated expected customer benefits by monetizing the value of (1) the reduction in the frequency and duration of outages (measured as CMI) and (2) avoided restoration costs. 1898 & Co. compared these benefits with the estimated costs of each investment to calculate the BCR. The BCR value represents 1898 & Co.'s sophisticated modeling of resiliency events, infrastructure vulnerabilities, rebuild costs, quantified customer benefits, and other factors to provide a reliable measure of the net benefit of resiliency investments for customers.

Ultimately, SPS selected the measures, programs, and activities presented in this SRP based on several objectives, including (1) mitigating the impacts of resiliency events with the greatest impacts on the SPS system and its customers, as determined by SPS's operational experience and the 1898 & Co. analysis; (2) furthering SPS's long-term resiliency objectives, including mitigating wildfire risks and modernizing system protection capabilities; (3) leveraging the BCR, which accounts for the historical performance of the system during resiliency events; and (4) optimizing the overall size of the Plan, with consideration for the costs to customers and SPS's ability to execute on the full portfolio of proposed investments between 2025 and 2028.

The proposed measures consist of new programs that will work in conjunction with existing programs and activities to make the SPS system more resilient and expansions of ongoing resiliency-related investments.

B. Project Prioritization and Implementation

SPS will prioritize execution of individual projects within each measure based on (1) the wildfire risk in an area, prioritizing work in areas designated as Wildfire Risk Tier 3 and Tier 2 by the Wildfire Risk Map developed in collaboration with EDM and (2) the BCR value for all projects with quantified benefits. This approach ensures that SPS is prioritizing work based on the

landscape/population wildfire risk and the historical performance of feeders, while providing further support to advance existing initiatives beyond what would be feasible outside of the SRP. SPS intends to implement this prioritization strategy at the circuit level by grouping investments so that all protection zones on a circuit that are targeted for investment under any of the five measures are addressed together. Based on this approach, several programs across various measures will be completed at the same time. This will promote the efficient use of work crews to save time and labor costs in the implementation of the Plan, which will aid SPS in its ability to fully execute on the SRP investments.

SPS is prioritizing wildfire mitigation efforts to address assets and vegetative fuels located in areas that have an elevated risk for wildfire danger and increased risks to human life and property. Areas prioritized for wildfire risk mitigation are based on risk levels established by the Wildfire Operations Map and the iterative approach to assess the landscape/population wildfire risk in SPS's service area discussed in Section IV.G.2 of this SRP. SPS has used its Wildfire Operations Map to prioritize its Wildfire Mitigation measure programs and supporting activities in the heightened wildfire risk areas located in its Texas service area (i.e., Wildfire Tiers 2 and 3). SPS will continue to use the Wildfire Operations Map to guide the implementation of the approved programs and activities.

C. Ongoing Resiliency Approach

SPS's commitment to resiliency did not begin with this SRP. As detailed in the Annual Summary Report on Infrastructure Storm Hardening,[34] SPS's storm hardening philosophy is to install overhead lines that meet or exceed the needs of its service area. This section describes several of SPS's ongoing programs, initiatives, and standards that contribute to system resiliency. Several of these initiatives are based on inspection and as-needed replacement of existing facilities and equipment to proactively identify defects or vulnerabilities and prevent failures before they occur. These ongoing programs will work in conjunction with the measures proposed in the SRP to further enhance the resiliency of the SPS system.

[34] *See* Reports of Storm Hardening, Project No. 39339, SPS Storm Hardening Report at 2 (May 1, 2024).

1. Construction Standards

In 2014, SPS updated its construction standards, transitioning from Grade C to Grade B construction for all new and rebuilt overhead facilities. Grade B is the highest grade of construction under the National Electric Safety Code ("NESC") and results in the highest strength and largest safety factors for overhead distribution facilities. Historically, this standard was used for transmission lines and was not typical for distribution lines. Extending the Grade B standard to all new and rebuilt distribution facilities means that all overhead lines installed since 2014 are hardened to SPS's highest standard, making them better able to withstand and mitigate resiliency events that impact the SPS service area.

2. Wood Pole Inspection and Treatment

As a part of the Wood Pole Inspection and Treatment Program, SPS has invested approximately $109 million to replace over 21,000 wooden poles since 2020. Regularly inspecting the health of poles is a crucial element of asset health management, because wooden poles decay with time and exposure to elements and wildlife. To manage pole health, SPS conducts frequent assessments and maintains a continuing pole replacement schedule. The Wood Pole Inspection and Treatment Program provides for a ground line inspection and remedial protective treatment for wood distribution and transmission poles. Wood poles are on a rotating cycle for inspection, with all wood poles receiving a visual inspection every 12 years and poles older than 10 years old receiving an invasive ground line inspection, assessment, and remedial treatment to arrest any existing deterioration and prevent future damage. Poles receiving an invasive inspection are assessed for remaining strength. Poles found to be compliant with the NESC guidelines receive remedial treatments and remain in service. Poles found to not be compliant with the NESC guidelines are prioritized for either replacement with Grade B construction or for ground line reinforcement to bring the pole into compliance. Because pole failures contributed to the largest amount of CMI from 2020-2022,[35] pole inspections have played, and will continue to play, an

[35] *See CY 2022 Electric Utility Service Quality Report Under 16 TAC § 25.81*, Project No. 54467, Southwestern Public Service Company's Report in Response to the Commission's December 14, 2023 Order in Docket No. 55614 at 3-4 (December 15, 2023).

important role in identifying and mitigating pole failures. Poles that have been upgraded since 2014 will not be addressed as a part of this SRP.

3. Routine Overhead System Maintenance

Through this program, SPS performs circuit assessments and any necessary rebuilds to resolve identified defects. This program reviews the entire SPS distribution system on a three-to-five-year cadence. Aspects of the underground system are reviewed as a part of the program; however, the primary focus is the assessment of overhead pole equipment including crossarms, cutouts, arrestors, conductor, jumpers, insulators, and other supporting equipment and hardware. SPS began this program in 2017 and has completed two full rounds of patrols, while currently nearing completion on the third round. Since 2017, SPS has addressed defects at over 49,000 locations.

4. Feeder Performance Improvement Program ("FPIP")

The FPIP program identifies the worst performing feeders in SPS's service territory and creates capital projects to improve their reliability. SPS compiles an annual list of distribution feeders, ranks them based on multiple reliability metrics, and completes a detailed engineering analysis to identify beneficial upgrades. Consistent with the Resiliency Rule, all activities proposed in this SRP are incremental to this program.

5. Advanced Capital Projects Initiative

SPS's Advanced Capital Projects initiative identifies facilities and areas of the system that need additional hardening based on specific input from SPS personnel regarding issues such as line condition, operating concerns, flexibility, and customer impact.

6. Fault Location Isolation and Service Restoration Project ("FLISR")

Under the FLISR project, SPS uses data from its Advanced Distribution Management System ("ADMS") to identify distribution feeders for modernization and equips selected facilities with automated field devices such as reclosers. SPS selects facilities based on the number of outages impacting the feeder mainline over the prior year, prioritizing the feeders with the greatest number of mainline outages. The devices installed under FLISR are integrated with the ADMS, allowing SPS to remotely monitor system conditions and control device settings.

IV. PROPOSED RESILIENCY MEASURES

This SRP is an integrated portfolio of measures and investments designed to collectively mitigate the risks posed to SPS's System by the resiliency events described above. SPS organized the SRP into five measures:

(1) Distribution Overhead Hardening

(2) Distribution System Protection Modernization

(3) Communication Modernization

(4) Operational Flexibility

(5) Wildfire Mitigation

SPS developed these five measures to address risks associated with resiliency events that pose a risk to the safe and reliable operation of the SPS System. As described above, these categories of resiliency events include Wind, Flood, Tornado, Winter, Heat, Cold, and Wildfire. Each SRP measure described in this section includes programs, activities, standards, services, procedures, practices, structures, or equipment used to address the risks these resiliency events pose to the SPS System. Implementing these measures will advance SPS's efforts to harden and modernize the grid, and integrate operational and information technology, which will better equip the SPS System to prevent, withstand, mitigate, and more promptly recover from the identified resiliency events and associated risks. Customers will benefit from a reduction in the frequency and duration of outages, reduced system restoration costs, and improvements in overall service reliability. Customers will also benefit from reductions in wildfire risk, general safety benefits, and improved service in areas of lower performance. The Commission's approval of this SRP will significantly enhance SPS's efforts to build a more resilient electric system.

A. Distribution Overhead Hardening

The Distribution Overhead Hardening Measure includes a comprehensive look at each protection zone along the feeder, identifies deficiencies in the construction, and rebuilds all facilities needed to upgrade the zone to SPS's current standards. This measure includes replacing distribution poles, conductor, line transformers, and open wire secondary; trussing/reinforcing distribution poles; adding new poles to mitigate long span-lengths; wrapping poles to mitigate

external wildfire risks in areas of heightened wildfire risk; and replacing arrestors and transformer fuses with non-expulsion alternatives to prevent ignitions in areas of heightened wildfire risk as a part of the Distribution Overhead Hardening measure.

Overhead distribution lines are a central focus of this SRP, as SPS's distribution system consists of 93 percent overhead lines and 7 percent underground lines.[36] SPS's service territory covers a vast, primarily rural, area with distribution lines often traveling great distances between customers. Many of these lines were built with long spans between supporting structures to reduce the number of poles needed to cover the distance. Long span lengths combined with large open areas with high wind conditions and icing potential make conductor more susceptible to galloping and contact, which can lead to overall fatigue and increased loading on the supporting structures.

1. Resiliency Events Mitigated

The Resiliency Rule requires that, for each measure, the utility must identify "one or more risks posed by resiliency events that the measure is intended to prevent, withstand, mitigate, or more promptly recover from."[37] In this section, SPS describes the resiliency events and risks this measure is designed to address.

The Distribution Overhead Hardening measure will enhance the structural integrity of SPS's overhead infrastructure to prevent, withstand, and mitigate the weather-based resiliency events and wildfire risks described in Section II above. This measure will mitigate risks posed by (1) Wind, (2) Flood, (3) Tornado, (4) Winter, (5) Heat, (6) Cold, and (7) Wildfire.

Pole replacements, additions, and reinforcement under this measure will reduce span lengths and make the rebuilt facilities more capable of surviving a Wind, Flood, Tornado (unless in the direct path of a tornado), and Winter events that can cause structural overloading. Conductor upgrades will increase structural integrity and provide additional capacity to prevent thermal overloads and facilitate load transfers during Heat and Cold events. The additional structural integrity from these activities will reduce the likelihood of conductor contact or broken equipment

[36] *See CY 2022 Electric Utility Service Quality Report Under 16 TAC § 25.81*, Project No. 54467, Southwestern Public Service Company's Report in Response to the Commission's December 14, 2023 Order in Docket No. 55614 at 4 (December 15, 2023).

[37] 16 TAC § 25.62(c)(2)(A).

igniting a wildfire. Replacing fuses and arrestors with non-expulsion alternatives in areas of heightened wildfire risk will also reduce ignition risk, and pole wraps in areas of heightened wildfire risk will protect facilities from external wildfire damage.

2. Description of Program in the Distribution Overhead Hardening Measure

The Resiliency Rule requires that the resiliency plan "must be organized by measure" and include "a description of any activities, actions, standards, services, procedures, practices, structures, or equipment associated with each measure."[38] This section provides a description of the Overhead Hardening measure in compliance with this requirement.

The Distribution Circuit Hardening Rebuilds program within the Distribution Overhead Hardening measure is designed to increase the resiliency of the SPS System through comprehensive rebuilds to increase the structural integrity and carrying capacity of overhead facilities.

Facilities hardened under this measure will be rebuilt to Grade B construction standards. This will allow the hardened facilities to withstand or mitigate many resiliency events that pose a risk to the SPS System. Where full rebuilds are the recommended solution, SPS will shorten span lengths beyond what is required by Grade B standards to prevent conductor contact during high-wind events.

In designing the Distribution Overhead Hardening Measure, SPS and 1898 & Co. considered (1) the wide range of resiliency event types, frequencies, and impacts, which pose varied risks to the system; (2) the makeup of the system, including customer counts and types, infrastructure age and condition, and significant deviations from current design standards; and (3) the cost of investments to address vulnerabilities and improve the resiliency of infrastructure, including partial and full rebuilds to the current hardening standards.

As shown in the 1898 & Co. report, approximately $1.8 billion of potential Distribution Overhead Hardening work has a BCR greater than 1.0. The BCR for all projects included in the

[38] 16 TAC § 25.62(c)(2).

SRP is at least 3.22, meaning the benefits of every project completed under this measure will exceed its costs more than three times over.

2.1 Description of Distribution Circuit Hardening Rebuilds Program

The Distribution Overhead Hardening measure is comprised of a single program: Distribution Circuit Hardening Rebuilds program. The program is comprised of seven discrete activities.

Details of the activities described below outline the guidelines given to 1898 & Co. to generate project estimates. Specific project scopes will be refined following a field review and engineering analysis prior to design and construction.

2.2 Descriptions of Activities within the Distribution Overhead Hardening Measure:

2.2.a Pole Replacements and Installations, Long Span Length Reduction

SPS will install new poles to address long span lengths and replace existing poles based on their age. New span lengths will be determined according to the conductor size to reduce loading on the supporting poles and prevent conductor contact during high-wind events. Table 6 below outlines the standards for span length under this measure. SPS will replace poles installed prior to 1980, which are now nearing their average approved service lives of 53 years.

Table 6 – Span Lengths

Wire Size	Additional Pole Needed for Spans Greater Than
#2	240ft
2/0	280ft
4/0	300ft
336 ACSR	290ft

2.2.b Pole Trussing

In locations where SPS finds that the addition of a new pole is not necessary to mitigate long span lengths or replacement is not identified based on age, poles that meet the below criteria will be trussed to reinforce the strength of the pole. Trussing adds new physical supports to the pole, which is particularly beneficial to harden areas of the overhead distribution system where span lengths exceed SPS's current standard but are not long enough to justify the addition of a new pole.

Figure 12: Image of Trussing

Table 7 – Truss Range	
Wire Size	**Truss Poles for Span Lengths Between**
#2	-
2/0	245ft - 280ft
4/0	230ft - 300ft
336 ACSR	215ft - 290ft

2.2.c Conductor Replacements

SPS will replace vulnerable conductor and secondary wire to meet current construction standards. This activity will target small-wire primary conductor, open-wire secondary, and other conductor installed prior to when the current design standards took effect. Small-wire primary includes conductor that is 4 American Wire Gauge ("AWG") or smaller, which is an outdated standard and provides limited carrying capacity. Due to its age, small-wire conductor often is brittle and typically has been spliced multiple times. Small-wire primary will be replaced with primary conductor of a larger size and carrying capacity. Where primary conductor is selected for replacement, SPS anticipates that a full rebuild of the protection zone will be required, including all poles installed prior to 2014.

Open wire secondary is composed of uninsulated conductor, installed pole to pole, that are located below the primary conductor(s) on the overhead distribution system. It is highly susceptible to damage from weather events due to exposure to vegetation. Outages associated with open wire secondary often require substantial time to repair and place back in service. Open wire secondary will be replaced with lashed cable where the primary conductor has been selected for replacement.

Figure 13: Image of Open Wire

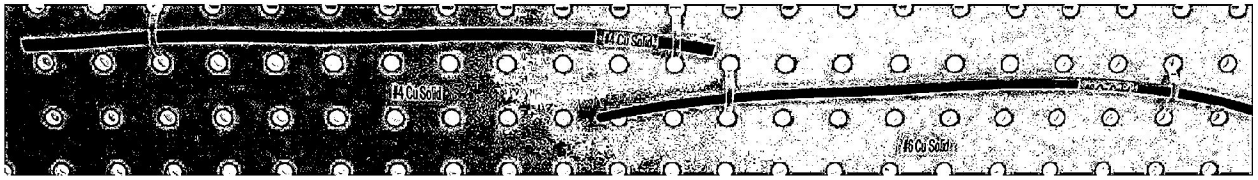
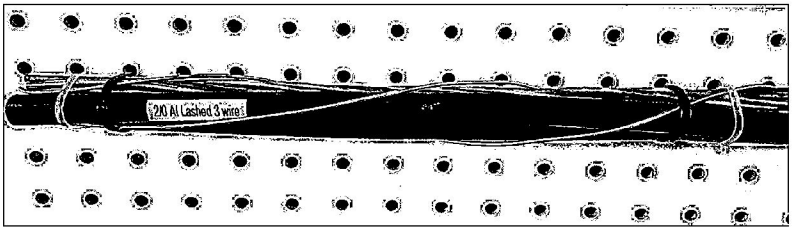


Figure 14: Image of Lashed Cable



2.2.d Line Transformer Replacements

SPS will replace line transformers that are approaching their end-of-life in protection zones hardened under the Distribution Overhead Hardening measure.

2.2.e Wildfire Pole Wraps

This activity involves wrapping poles in fire retardant material to mitigate the risk of pole damage from wildfires. SPS will install pole wraps on all poles that are located in areas of heightened wildfire risk.

2.2.f Expulsion Fuse Replacement

SPS will replace expulsion fuses and associated fuse cutouts with non-expulsion equivalents to mitigate the risk of wildfire ignition. Non-expulsion fuses reduce wildfire ignition risk because they do not emit sparks when they operate. SPS will replace fuses and fuse cutouts in protection zones selected for rebuilds under this measure that are located in areas of heightened wildfire risk.

Figure 15: Expulsion Fuse Sparking

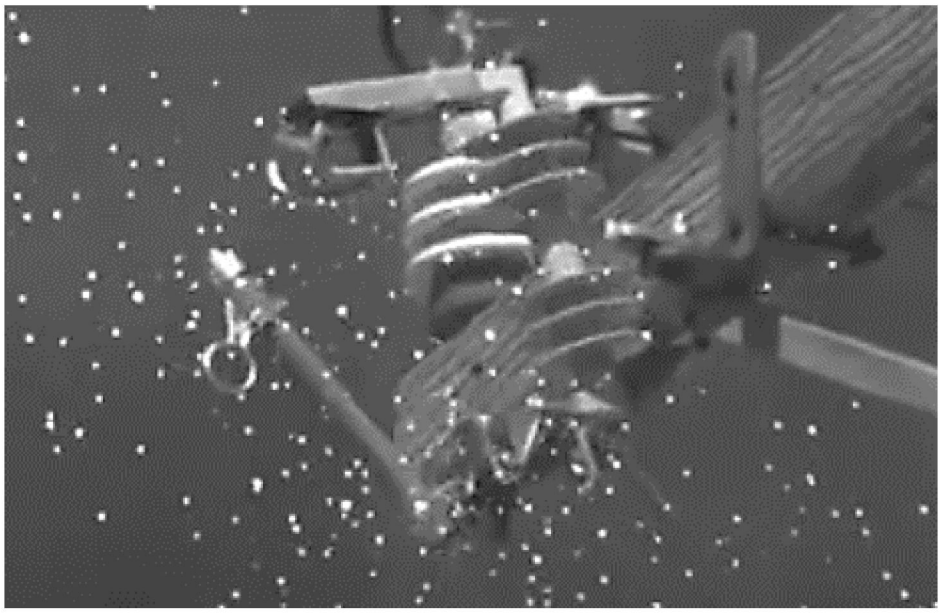
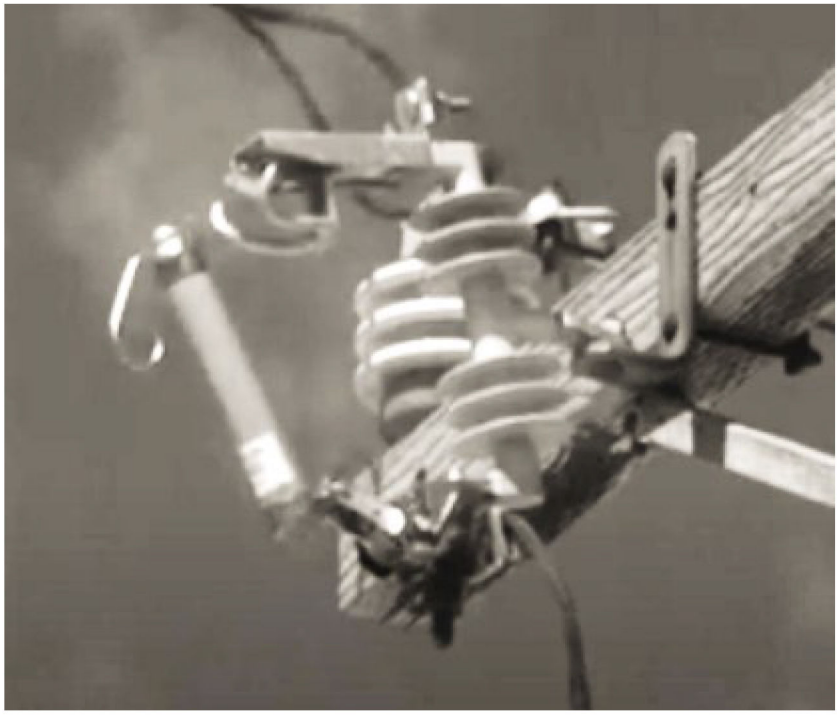


Figure 16: Non-expulsion Fuse in Operation

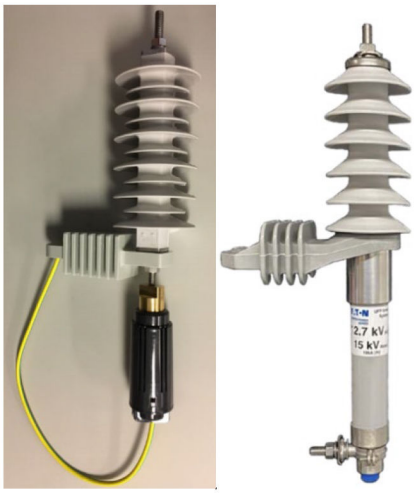


2.2.g Wildfire Arrestor Replacement

SPS will replace wildfire arrestors on in-line transformers with non-expulsion equivalents to mitigate the risk of wildfire ignition. Non-expulsion arrestors reduce wildfire ignition risk because they do not emit sparks when they operate. SPS will replace arrestors in protection zones selected for rebuilds under this measure that are located in areas of heightened wildfire risk.

Figure 17: Standard Arrestor

Figure 18: Wildfire Arrestors



3. Evidence of Effectiveness and Expected Benefits

The Resiliency Rule requires an SRP to "include evidence of the effectiveness of the measure in preventing, withstanding, mitigating, or more promptly recovering from the risks posed by the identified resiliency event."[39] Evidence that is quantitative, performance-based, or provided by an independent entity with relevant experience is afforded greater weight.[40] Further, the SRP must "explain the expected benefits of the resiliency measures including, as applicable, reduced system restoration costs, reduction in the frequency or duration of outages for customers, and any improvement in the overall service reliability for customers, including the classes of customers served and any critical load designations."[41]

SPS engaged 1898 & Co. to evaluate the effectiveness and expected benefits for the Distribution Overhead Hardening measure. 1898 & Co. comprehensively evaluated the SPS overhead system to identify potential hardening projects. Each project consists of the full set of equipment additions, upgrades, and replacements necessary to bring a protection zone into full compliance with SPS's current hardening standard. The results of this evaluation are provided in Section 6.1.4 of the 1898 & Co. report. Table 8 below summarizes the results of the benefit-cost analysis for the projects included in the Plan.

Table 8 Distribution Overhead Hardening Projects

Average BCR	Minimum BCR	Average CMI Reduction	Avoided Restoration Costs
4.7	3.22	58%	76%

The Distribution Overhead Hardening projects included in the Plan have an average BCR of 4.7, with a minimum of 3.22. This means that the expected customer benefits for every project that SPS proposes are at least three times greater than the estimated costs. 1898 & Co. estimates

[39] 16 TAC § 25.62(c)(2)(A)(iii).

[40] *Id.*

[41] 16 TAC § 25.62(c)(2)(A)(iii).

that the projects included in the Plan will result in a 58% average reduction in CMI and a 76 percent average reduction in system restoration costs.

These results are quantitative evidence that the Distribution Overhead Hardening measure will be effective in preventing, withstanding, mitigating, or more promptly recovering from the risks posed by the identified resiliency events. The results further demonstrate that the Distribution Overhead Hardening measure will provide benefits for SPS customers in the form of reduced frequency and duration of customer outages, reduced system restoration costs, and improvement in the overall reliability of service.

In addition to the quantified benefits, the Distribution Overhead Hardening measure will also provide qualitative benefits for SPS customers, including improved safety, improved reliability of service during and after a resiliency event, reduced wildfire ignition risks, and reduced susceptibility to outages caused by wildfire damage, consistent with leading utility wildfire management strategies, as EDM concluded.

4. Proposed Implementation of Measure

The Resiliency Rule requires an SRP to include "implementation details for each of the plan's measures, including estimated capital costs, estimated operations and maintenance expenses, an estimated timeline for completion, and, when practicable and appropriate, estimated net salvage value (value of the retired asset less depreciation and cost of removal) and remaining service lives of any assets expected to be retired or replaced by resiliency-related investments."[42]

SPS will conduct work in the Distribution Overhead Hardening measure throughout the duration of the SRP period, beginning in 2025 and continuing through 2028. SPS will harden approximately 170 protection zones, prioritizing projects for rebuilds based on the wildfire risk in the area and the BCR. Individual project scopes will be refined following a field review and engineering analysis prior to design and construction.

[42] 16 TAC § 25.62(c)(2)(E).

Table 9 – Distribution Overhead Hardening Implementation Distribution Circuit Hardening Rebuilds Program Estimated Scope of Work	
Activity	**Count**
Pole Replacements and Installations	**10,865 Poles Replaced**
Pole Installations (Long Span Length Mitigation)	**5,289 Poles Installed**
Pole Trussing	**1,688 Trusses**
Primary Conductor Replacements	**783 Miles**
Open Wire Secondary Replacements	**11 Miles**
Line Transformer Replacements	**515 Transformers**
Pole Wraps	**14,264 Wraps**
Wildfire Transformer Fuse Replacements	**452 Fuses**
Non-Expulsion Fuse Replacements	**173 Arrestors**

Table 10 – Distribution Overhead Hardening Budget					
Program: Distribution OH Hardening Measure	**2025**	**2026**	**2027**	**2028**	**Total Plan**
Capital	$19.5 M	$56.1 M	$75.7M	$101.7M	$253.0
O&M	$0	$0	$0	$0	$0
Total Estimated Spend	$19.5 M	$56.1 M	$75.7M	$101.7M	$253.0M

5. Metrics for Evaluating Effectiveness of Distribution Overhead Hardening Measure

The Resiliency Rule requires that "[e]ach measure in the resiliency plan must include a proposed metric or criteria for evaluating the effectiveness of that measure in preventing, withstanding, mitigating, or more promptly recovering from the risks associated with the resiliency event it is designed to address."[43]

The metrics SPS proposes to evaluate the effectiveness of this measure include identification of underperforming areas, the average duration of outage events, average storm restoration durations, comparison of hardened vs. non-hardened protection zones, and hardened protection zone improvement. Please see Section V of this Plan for details on the evaluation metrics.

6. Reasonable Alternatives Considered

The Resiliency Rule requires that an SRP "explain the selection of each measure over any reasonable and readily-identifiable alternatives."[44]

[43] 16 TAC § 25.62(c)(2)(C).

[44] 16 TAC § 25.62(c)(2)(A)(v).

As an alternative to the Distribution Overhead Hardening measure, SPS considered overhead-to-underground conversions and staying on the same inspect, test, replace cycle supported by existing programs. When reasonably targeted, undergrounding can provide cost effective resiliency benefits to customers. As a general matter, however, undergrounding is not a cost-effective alternative to overhead hardening in most of SPS's service area. Undergrounding facilities can range from five to ten times the cost per mile of fully rebuilding the lines overhead and faces significant voltage losses as the distance between substations increases. Staying on the same inspect, test, and replace cycle that SPS operates under today would not provide the additional resiliency benefits identified by 1898 & Co. SPS identified the Distribution Overhead Hardening measure as being the most cost-effective solution for the projects selected as part of the Plan. This measure will address all issues on the protection zone at one time, whereas existing programs only identify and address point failures and miss opportunities to bring the entire zone to the current standard. This approach will reduce CMI for all customers in the protection zone, as the failure of a single asset in a protection zone results in the failure of the entire protection zone.

7. Measure Distinction from Existing Programs

Pursuant to the Resiliency Rule, if a utility's resiliency plan measures are similar to programs and measures the utility is already implementing, the plan "must distinguish the measures in the resiliency plan from these programs and measures and, if appropriate, explain how the related items work in conjunction with one another."[45]

The Wood Pole Inspection and Treatment program and the Routine Overhead Maintenance program involve periodic inspections and replacements of individual assets. These programs are intended to prevent point failures based on asset condition, not to provide comprehensive hardening for a protection zone. Circuit rebuilds under FPIP address only the worst performing feeders on the SPS system. The Distribution Overhead Hardening measure will target specific protection zones for comprehensive rebuilds to harden the entire zone against the risks posed by weather-based resiliency events and wildfire. The wildfire-specific activities in areas of heightened wildfire risk are not part of the existing programs. And because SPS is selecting protection zones

[45] 16 TAC § 25.62(c)(2)(D).

for rebuilds based on the BCR, this measure will target the facilities that provide the greatest net resiliency benefit for customers, not necessarily those with the worst historical performance.

Despite these differences, the Distribution Overhead Hardening measure will work in conjunction with the existing programs in several ways. First, work completed under the existing programs will reduce the costs associated with this measure because SPS will not replace facilities installed since 2014 that meet current standards. Second, the work completed under this measure has the potential to reduce the scope of the capital maintenance required under the existing programs because all assets in the targeted protection zones will have been upgraded to the current standard. Finally, if any circuits are selected for rebuilds under this measure that would otherwise have been eligible for improvement under FPIP, that will allow FPIP to address additional low-performing feeders.

8. Additional Information Required by the Resiliency Rule

The Resiliency Rule requires an SRP to state whether a measure (1) "is a coordinated effort with federal, state, or local government programs or may benefit from any federal, state, or local government funding opportunity"[46] or if the measure (2) "may require a transmission system outage to implement."[47]

The Distribution Overhead Hardening measure is not a coordinated effort with any federal, state, or local government program. Potential opportunities for government funding may exist in the future but none are applicable to this measure at this time.

The Distribution Overhead Hardening measure should not require any transmission outages to implement. If, however, an outage is required, SPS commits to coordinate the outage with the Southwest Power Pool.

B. Distribution System Protection Modernization

While the Distribution Overhead Hardening measure is designed to provide resilience improvement by having fewer infrastructure failures, this measure is designed to improve

[46] 16 TAC § 25.62(c)(2)(A)(iv).

[47] 16 TAC § 25.62(c)(2)(A)(vi).

absorptive capacity by decreasing the absolute impact of infrastructure failures when they occur. As explained in Section 6.2.1 of the 1898 & Co. report, improving absorptive capacity does not decrease the number of failures, but it does lessen the impact of those failures.

The Distribution System Protection Modernization measure includes two programs to reduce the customer impacts of outages: (1) Mainline Automated Reclosing Deployment and (2) Lateral Reclosing Deployment.

The Mainline Automated Reclosing Deployment program includes activities such as installing additional reclosers on the circuit to sectionalize mainline, installing reclosers at ties between circuits, installing communications equipment on existing reclosers, replacing reclosers with equipment that can accept communications, and replacing substation breakers and relay panels with modern equipment that can accept communications and be remotely operated. SPS will perform protection studies to optimize protection schemes and device placement. Additionally in heightened wildfire risk areas, SPS will install fault indicators, replace tap level fuses with non-expulsion alternatives, and modernize protection schemes. Communications-enabled relays, breakers, and reclosers installed under this program connect to SPS's ADMS through the communications upgrades completed under the Communication Modernization measure. Under the Lateral Reclosing Deployment program, SPS will install reclosers on select lateral circuits.

Details of the program activities described below outline the guidelines given to 1898 & Co. to generate project estimates. Specific project scopes will be refined following a field review and engineering analysis prior to design and construction.

Modernizing protection schemes in areas of heightened wildfire risk involves the implementation of enhanced powerline safety settings ("EPSS"), which is an industry leading protection standard in areas susceptible to wildfires. EPSS is an operational mitigation that modifies settings in relays and recloser controls on the distribution system (both within the substation and outside the substation on the feeder) to create a wildfire-specific operating mode. When EPSS is activated, relays and reclosers are more sensitive to electrical faults and react faster to those faults compared to normal device settings. When activated, EPSS also disables reclosing in relays and reclosers that would normally be set to automatically reclose after tripping because

of a fault. Ultimately, EPSS allows for powerlines to remain in service during periods of elevated wildfire risks, but with protection settings that reduce ignition risk.

SPS will perform the work in the Distribution System Protection Modernization measure on circuits with a BCR greater than or equal to 0.9. As noted in the 1898 & Co. report, their evaluation did not include an analysis of safety-related benefit streams or benefits related to reduced wildfire risks. Thus, for investments with a BCR between 0.9 and 1.0, mitigating general safety risks and other qualitative considerations provide sufficient direct benefits that the total benefits are in excess of costs. This measure will mitigate general safety risks and will also provide qualitative benefits for SPS customers in the form of wildfire risk mitigation, which will be achieved through the enabling of EPSS, addition of non-expulsion equipment, and installation of fault indicators.

Details of the program activities described below outline the guidelines given to 1898 & Co. to generate project estimates. Specific project scopes will be refined following a field review and engineering analysis prior to design and construction.

1. Resiliency Events Mitigated

The Resiliency Rule requires that, for each measure, the utility must identify "one or more risks posed by resiliency events that the measure is intended to prevent, withstand, mitigate, or more promptly recover from."[48]

Like the Distribution Overhead Hardening measure, the Distribution System Protection Modernization measure addresses the resiliency risks associated with Wind, Flood, Tornado, Winter, Heat, Cold, and Wildfire events. However, in contrast to the Distribution Overhead Hardening measure's focus on preventing and withstanding those risks, this measure will focus on mitigating and more promptly recovering, primarily through the use of reclosers and communications equipment to enable sectionalization, load transfer, and remote monitoring and control of the SPS system. This measure includes two programs: Mainline Automated Reclosing Deployment and Lateral Reclosing Deployment.

[48] 16 TAC § 25.62(c)(2)(A).

2. Description of Programs in the Distribution System Protection Modernization Measure

The Resiliency Rule requires that the resiliency plan "must be organized by measure" and include "a description of any activities, actions, standards, services, procedures, practices, structures, or equipment associated with each measure."[49] This section describes the Distribution System Protection Modernization measure in compliance with that requirement of the Rule.

2.1 Description of Mainline Automated Reclosing Deployment Program

The Mainline Automated Reclosing Deployment program includes the deployment of mainline reclosers, breakers, relays, and the controls necessary to increase sectionalization and enable automated feeder switching.[50] When an outage occurs, sectionalization minimizes the number of downstream customers initially impacted by using reclosers to isolate the fault. Automated feeder switching reconfigures the system to transfer customer load to facilities with sufficient capacity to minimize customer downtime.

Based on historical experience, SPS has estimated needing to install a minimum of one recloser every 10 circuit miles to coordinate devices and detect faults on the system. However, fewer or additional installations may be needed to optimize distribution protection schemes for sectionalization. As SPS is modernizing the protection scheme, all tie reclosers will be installed with, or upgraded to include communications capabilities. Substation upgrades will be performed at the stations that directly serve the upgraded protection schemes.

The Mainline Automated Reclosing Deployment program is comprised of eight activities described below.

[49] 16 TAC § 25.62(c)(2).

[50] The "mainline" refers to the portion of a feeder that is directly protected by the substation breaker or an automated feeder switch.

2.1.a Description of Sectionalizing Recloser Installation Activity

SPS will install additional reclosers to sectionalize mainline facilities and enhance the resiliency of the system during extreme weather events. Sectionalization provides operational flexibility and allows for shorter restoration times.

Sectionalizing the distribution system enables the isolation of faults and restoration of service to sections of the distribution system that were not directly impacted by the fault. This mitigates the impact of equipment damaged during extreme weather events, such as faults caused by broken conductor in specific sections of the distribution system. Additional reclosers on the circuit can also mitigate risks of overloading the equipment caused by extreme temperatures via redirecting power flows and transferring load between facilities.

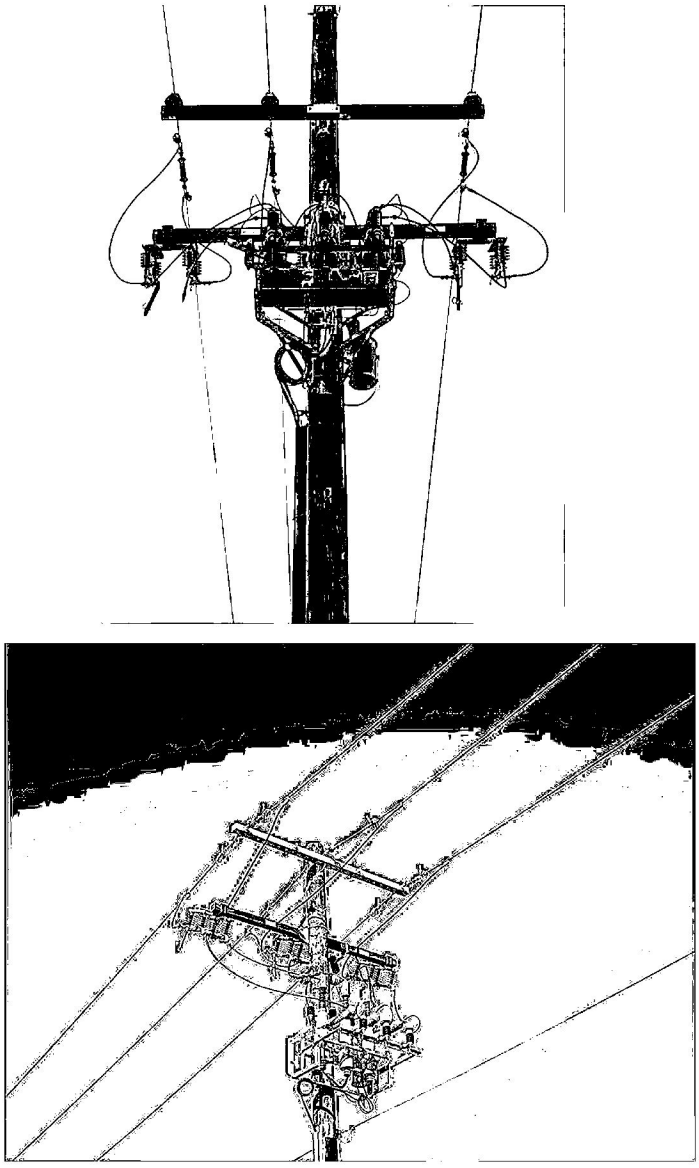
2.1.b Description of Tie Recloser Installation Activity

SPS will install mid-point (tie) reclosers to facilitate load transfers, as depicted in Figure 4-6 of the 1898 & Co. Report. Historically, an open switch was installed between circuits and a field employee must be deployed to manually transfer load during an outage or potential overload. SPS will replace that switch with a recloser so that lines on either side of the tie point can be transferred remotely through the ADMS. As full modernization of the circuit takes place, all reclosers on the circuit will have the ability to open or close as needed to sectionalize the circuits from both directions. This will allow fewer customers to be impacted by an outage event.

2.1.c Description of Existing Recloser and Communication Replacements Activity

In addition to installing sectionalizing and mid-point (tie) reclosers, SPS will replace existing reclosers without sufficient control capabilities with equipment that can accept communications. Reclosers already equipped with communications and control capabilities will not be replaced. Necessary communications upgrades will be performed to enable remote operation and remote control of device settings.

Figure 19: Image of Existing Recloser vs. Replacement



2.1.d Description of Substation Relay Panel Replacements Activity

SPS will convert legacy electromechanical solid-state relays to microprocessor relays capable of communications and EPSS. If no RTU or modem exists at the substation, SPS will connect a cellular modem as each relay is converted.

2.1.e Description of Substation Breaker Replacements Activity

At substations where SPS is replacing or resetting relays under this measure, SPS will replace distribution circuit breakers classified as "end of life" (50+ years) as part of the same

project. This is consistent with industry practice, as it allows the entire portion of the substation to be modernized at once and better ensures the system relay and protection system as a whole will function properly. Consolidating the breaker and relay work is more cost-effective than replacing the circuit breaker on a subsequent project.

2.1.f Description of Fault Indicator Installation Activity

SPS will install wildfire fault indicators at fused tap locations in areas of heightened wildfire risk that do not currently have such capabilities. This will enhance SPS's ability to identify faulted segments during patrol following an outage or when wildfire conditions dictate alternative operating of the system.

2.1.g Description of Non-Expulsion Fuses Activity

SPS will replace tap-level fuses on circuits that are entirely or partially located in areas of heightened wildfire risk with non-expulsion alternatives to mitigate ignition risk. Non-expulsion fuses mitigate wildfire ignition risk because they do not emit sparks when they operate.

2.1.h Description of EPSS Activity

SPS will implement EPSS as a part of the modernization of settings on circuits upgraded in areas of heightened wildfire risk.

2.2 Description of Lateral Recloser Deployment Program

SPS will replace fuses with lateral reclosers in areas without heightened wildfire risk. Like the Mainline Automated Reclosing Deployment program, this program will involve installing reclosers at strategic locations on the SPS System to enhance sectionalization. However, under this program, SPS will install reclosers on lateral circuits (i.e., circuits that would be typically protected by a fuse). These devices will not remotely communicate with the ADMS, meaning SPS cannot remotely adjust automated reclosing settings or enable EPSS. In times of high wildfire risk, these are critical features of reclosers that have the ability to communicate remotely. There are no additional activities within the Lateral Recloser Deployment program.

3. Evidence of Effectiveness and Expected Benefits

The Resiliency Rule requires an SRP to "include evidence of the effectiveness of the measure in preventing, withstanding, mitigating, or more promptly recovering from the risks posed by the identified resiliency event."[51] Evidence that is quantitative, performance-based, or provided by an independent entity with relevant experience is afforded greater weight.[52] Further, the SRP must "explain the expected benefits of the resiliency measures including, as applicable, reduced system restoration costs, reduction in the frequency or duration of outages for customers, and any improvement in the overall service reliability for customers, including the classes of customers served and any critical load designations."[53]

SPS engaged 1898 & Co. to evaluate the effectiveness and expected benefits for the Distribution System Protection Modernization measure. 1898 & Co. comprehensively evaluated the SPS distribution system to identify potential modernization projects. Each project consists of the full set of equipment additions, upgrades, and replacements necessary to fully modernize the protection scheme on that circuit (for mainline projects) or protection zone (for lateral projects). This includes optimizing the number of customers between reclosers to maximize customer benefits. 1898 & Co. quantified the benefits for each project by recalculating historical outage

[51] 16 TAC § 25.62(c)(2)(A)(ii).

[52] *Id.*

[53] 16 TAC § 25.62(c)(2)(A)(iii).

records to account for the sectionalization, load transfer, and automated reclosing capabilities of a fully modernized circuit.

The recalculated outage records provide the quantified benefits of the measure in terms of reduced frequency or duration of outages (measured as a reduction in CMI) and avoided restoration costs. 1898 & Co. monetized the avoided CMI using the DOE ICE Calculator to calculate the BCR value for each program. The results of this analysis are provided in Section 6.2.4 of the 1898 & Co. report.

Table 11 below summarizes the results of the benefit-cost analyses for the Mainline Automated Reclosing Deployment and Lateral Reclosing Deployment projects included in the Plan.

Table 11 Distribution System Protection Modernization

Program	Average BCR	Minimum BCR	Average CMI Reduction	Avoided Restoration Costs
Mainline Automated Reclosing Deployment	4.2	0.9	37%	68%
Lateral Reclosing Deployment	1.8	0.9	21%	100%

The Mainline Automated Reclosing Deployment projects included in the Plan include all projects with a BCR of 0.9 or higher and have an average BCR of 4.2. 1898 & Co. estimates that the projects included in the Plan will result in a 37% average reduction in CMI and a 68% average reduction in system restoration costs.

The analysis shows that approximately $79.7 million, or 37 percent, of the total potential investment in the Mainline Automated Reclosing Deployment program has a BCR of 1.0 or greater. The quantified benefits for these projects are approximately $330 million, resulting in a BCR of 4.3.

These results are quantitative evidence that the Distribution System Protection Modernization measure will be effective in preventing, withstanding, mitigating, or more promptly recovering from the risks posed by resiliency events. They demonstrate that the Distribution System Protection Modernization measure will provide benefits for SPS customers in the form of reduced outage duration, reduced system restoration costs, and improvement in the overall reliability of service.

In addition to the quantified benefits, this measure will also provide qualitative benefits for customers, including through installation of fault indicators, non-expulsion fuses, and enablement of EPSS. Customers will benefit from reduced wildfire ignition risk reduction, improved safety, and improved reliability during and after a resiliency event.

4. Proposed Implementation of Measure

The Resiliency Rule requires an SRP to include "implementation details for each of the plan's measures, including estimated capital costs, estimated operations and maintenance expenses, an estimated timeline for completion, and, when practicable and appropriate, estimated net salvage value (value of the retired asset less depreciation and cost of removal) and remaining service lives of any assets expected to be retired or replaced by resiliency-related investments."[54]

SPS will execute the Distribution System Protection Modernization measure throughout the duration of the SRP's three-year period, beginning in 2025 and continuing through 2028. SPS will modernize approximately 151 protection zones, prioritizing projects for upgrades based on the wildfire risk in the area and the BCR. Individual project scopes will be refined following a field review and engineering analysis prior to design and construction.

[54] 16 TAC § 25.62(c)(2)(E).

Table 12 – Distribution System Protection Modernization Estimated Scope of Work		
Program	**Activity**	**Count**
Mainline Automated Reclosing Deployment	**Sectionalizing Recloser Installations**	**402 Reclosers**
	Sectionalizing Recloser Replacements	**53 Reclosers**
	Tie Recloser Installations	**226 Reclosers**
	Existing Recloser Communication Installations	**28 Communication Installs**
	Substation Relay Panel Replacements	**65 Relays Replaced**
	Substation Relay Panel Reconfigurations	**86 Relays Reconfigured**
	Substation Breaker Replacements	**16 Breakers**
	Fault Indicator Installations	**963 Fault Indicators**
	EPSS Feeder Upgrades	**151 Feeders**
	Wildfire Fuse Replacements	**2,567 Fuses**
Lateral Reclosing Deployment*	**Lateral Recloser Installation**	**62 Lateral Reclosers**

*Activity counts are based on 1898 & Co. analysis. SPS will refine project scopes following a field review and engineering analysis prior to design and construction.

Table 13 – Distribution System Protection Modernization Budget					
Program: Distribution System Protection Modernization Measure	**2025**	**2026**	**2027**	**2028**	**Total Plan**
Capital	$8.1M	$19.4M	$28.3M	$36.5M	$92.3M
O&M	$0	$0M	$0M	$0M	$0M
Total Estimated Spend	$8.1M	$19.4M	$28.3M	$36.5M	$92.3M

5. Metrics for Evaluating Effectiveness of Distribution System Protection Modernization Measure

The Resiliency Rule requires that "[e]ach measure in the resiliency plan must include a proposed metric or criteria for evaluating the effectiveness of that measure in preventing, withstanding, mitigating, or more promptly recovering from the risks associated with the resiliency event it is designed to address."[55]

The metrics SPS proposes to evaluate the effectiveness of this measure include identification of underperforming areas, the average duration of outage events, and average storm restoration durations. Please see Section V of this Plan for details on the evaluation metrics.

6. Reasonable Alternatives Considered

The Resiliency Rule requires that an SRP "explain the selection of each measure over any reasonable and readily-identifiable alternatives."[56]

No viable and cost-effective alternatives exist to sectionalize the distribution system. The 1898 & Co. analysis considered various alternatives around the level of sectionalization (customer pod size) and the number of reclosers needed to optimize protection schemes and provide the maximum customer benefit that is technically feasible. SPS selected the optimal configuration for each circuit.

7. Measure Distinction from Existing Programs

Pursuant to the Resiliency Rule, if a utility's resiliency plan measures are similar to programs and measures the utility is already implementing, the plan "must distinguish the measures in the resiliency plan from these programs and measures and, if appropriate, explain how the related items work in conjunction with one another."[57]

The Distribution System Protection Modernization Measure will work in conjunction with the FLISR program, which is described in Section III.C above. In December 2021, SPS activated the ADMS, which has many core and advanced functions that include FLISR. SPS began its multi-

[55] 16 TAC § 25.62(c)(2)(C).

[56] 16 TAC § 25.62(c)(2)(A)(v).

[57] 16 TAC § 25.62(c)(2)(D).

year deployment of FLISR in 2023, including the deployment of additional automated field devices such as reclosers that are integrated with the ADMS. FLISR reviews and selects projects for upgrades based strictly on the historical performance of the mainline of the feeder.

The work proposed in the Distribution System Protection Modernization measure is incremental to FLISR work and will broaden SPS's deployment of communications-enabled field devices to circuits with demonstrated net benefits for customers. This measure also includes additional work in the substation that is not part of the FLISR program.

8. Additional Information Required by the Resiliency Rule

The Resiliency Rule requires an SRP state whether a measure (1) "is a coordinated effort with federal, state, or local government programs or may benefit from any federal, state, or local government funding opportunity[58] or if the measure (2) "may require a transmission system outage to implement."[59]

The Distribution System Protection Modernization measure is not a coordinated effort with any federal, state, or local government program. Potential opportunities for government funding may exist in the future but none are applicable to this measure at this time.

The work performed under this measure should not require any transmission outages to implement. If, however, a transmission outage is required, SPS commits to coordinate the outage with Southwest Power Pool.

C. Communication Modernization

The Resiliency Rule requires that the resiliency plan "must be organized by measure" and include "a description of any activities, actions, standards, services, procedures, practices, structures, or equipment associated with each measure."[60] This section provides a description of the Communication Modernization measure in compliance with that requirement of the Rule.

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[58] 16 TAC § 25.62(c)(2)(A)(iv).

[59] 16 TAC § 25.62(c)(2)(A)(vi).

[60] 16 TAC § 25.62(c)(2).

The Communication Modernization measure consists of investments in private communications infrastructure to modernize SPS's operational technology ("OT") communications, including building out a private LTE ("pLTE") cellular network. Modernizing communication and protection systems is a high priority for SPS. The proliferation of connected devices presents exciting opportunities to provide value for customers through applications such as automated switching, EPSS, and advanced metering. These devices require a reliable, and reliably available, communications network to connect them to SPS's ADMS. Unfortunately, public cellular networks provide inadequate coverage across much of SPS's rural, sparsely populated service area to deploy the devices on a widespread basis. Additionally, reliance on a third-party cellular network presents cybersecurity risks for SPS's critical infrastructure.

Building out a pLTE network is essential to fully enable the operational capabilities of the protective relays, breakers, and reclosers proposed in the Distribution System Protection Modernization measure. Without it, these devices cannot communicate with the ADMS or be remotely monitored or controlled. Migrating system communications to a pLTE network will also make the SPS system more resilient and secure against the threat of cyber-attacks because SPS will maintain visibility and control over network access, data traffic, and security protocols.

In designing the Communication Modernization measure, SPS considered: (1) the technology enhancements needed to fully deploy new capabilities across the SRP, (2) the level of investment needed to support the other resiliency measures; and (3) SPS's long-term objectives for OT and system communications and existing capabilities gaps.

In addition to the investments in pLTE infrastructure, the Communication Modernization measure includes supporting investments in optical ground wire ("OPGW"), to provide data transport (i.e., "backhaul") between the pLTE network and the ADMS, and remote terminal units ("RTUs"), to provide visibility into substation operations.

1. Resiliency Events Mitigated

The Resiliency Rule requires that, for each measure, the utility must identify "one or more risks posed by resiliency events that the measure is intended to prevent, withstand, mitigate, or more promptly recover from."[61]

The Communication Modernization measure mitigates resiliency risks associated with Wind, Flood, Tornado, Winter, Heat, Cold, and Wildfire events by enabling the remote monitoring and control of the protective devices proposed under the Distribution System Protection Modernization measure. This measure also mitigates cybersecurity resiliency risks.

2. Description of Program in the Communication Modernization Measure

The Resiliency Rule requires that the resiliency plan "must be organized by measure" and include "a description of any activities, actions, standards, services, procedures, practices, structures, or equipment associated with each measure."[62] This section provides a description of the Communication Modernization measure in compliance with that requirement of the Rule.

Under this measure, SPS will invest in private communications infrastructure to extend pLTE and private fiber networks across its service area. These investments are critical to SPS's long-term objectives for resiliency, wildfire mitigation, and cybersecurity. SPS will construct 49 new pLTE towers at existing SPS substations and microwave installations, add approximately 83 miles of new OPGW and install 4 RTUs to terminate the OPGW. The RTUs will be installed at SPS substations with a pLTE tower to provide backhaul between the pLTE network and the ADMS.

The pLTE network, private fiber network, and public carrier network, which will continue to be used as a backup, will provide three layers of redundancy to prevent any single event from disrupting SPS's system communications. The RTUs will provide visibility into system conditions and remote-control capabilities at the substations where they are installed.

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[61] 16 TAC § 25.62(c)(2)(A).

[62] 16 TAC § 25.62(c)(2).

The pLTE network will increase communications availability, provide greater visibility into the state of the SPS electric system, enable remote operation and control of connected devices, and allow SPS to exercise greater control over network security and reliability. Existing public carrier networks do not provide coverage across large portions of SPS's service area. This prevents SPS from being able to effectively deploy communications-enabled devices such as protective relays, breakers, and reclosers in these areas. These protective devices are central to SPS's efforts to make the system more resilient. Connected reclosers can be remotely controlled to sectionalize the distribution system, isolate faults, and transfer customer load when a thunderstorm, ice storm, or other resiliency event causes an outage. Communicating relays allow SPS to remotely monitor system conditions and activate EPSS settings to mitigate wildfire ignition risks. In order to provide these capabilities, devices need access to a secure, reliable communications network.

In addition to the benefits for weather-based resiliency events and wildfire, the Communication Modernization measure will also make SPS's OT communications, and therefore SPS's electric system, more secure against risks posed by cybersecurity threats.

Sending system communications through public networks makes SPS reliant on third-party carriers to adequately secure their network communications. SPS's data is not prioritized, and once data is transmitted, SPS loses the ability to monitor it until it is received by SPS's backend systems.

Migrating to the pLTE network will subject communications to SPS's robust cybersecurity protections. Bad actors will have fewer attack vectors to infiltrate the network because only approved devices will have access. SPS will implement rogue-device protection to prevent unauthorized access, as well as encryption and multi-factor authentication to make end-use devices more secure. The network will be protected by end-to-end monitoring of all data traffic and devices and will be a zero-trust environment, allowing SPS to implement additional security controls such as Internet Protocol Security (IPSec) tunnels to encrypt and authenticate data traffic. These security measures will prevent or mitigate potential cyber-threats from disrupting the safe and reliable operation of the SPS electric system.

The Communication Modernization measure is comprised of a single program: Private Circuit Communications Deployment, which program includes three distinct activities.

2.1 Description of Activities within the Private Circuit Communications Deployment Program

2.1.a Private LTE Network Buildout

The pLTE network buildout consists of 49 pLTE tower installations. This work is intended to provide coverage in areas of high wildfire risk, enabling device connection where previously not possible. The following figures show the planned locations of the proposed pLTE towers and network coverage over SPS's distribution system:

Figure 20 – Texas North

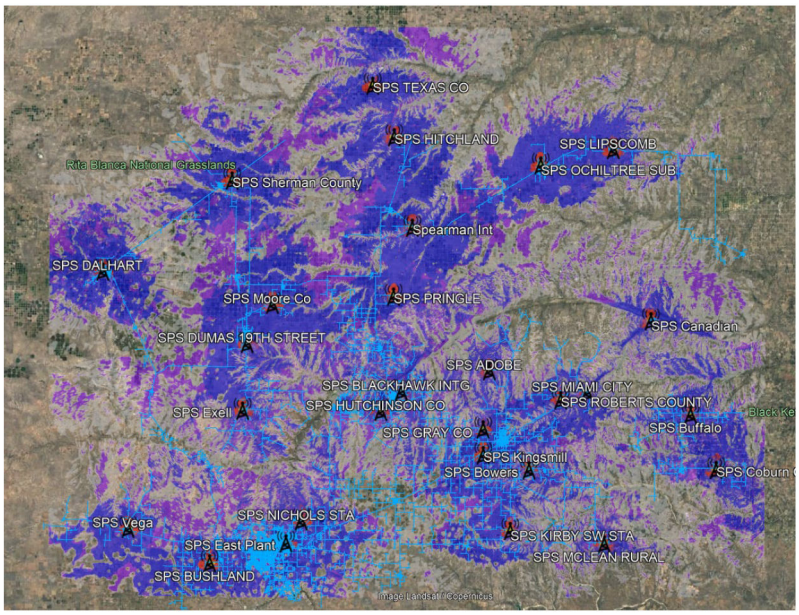
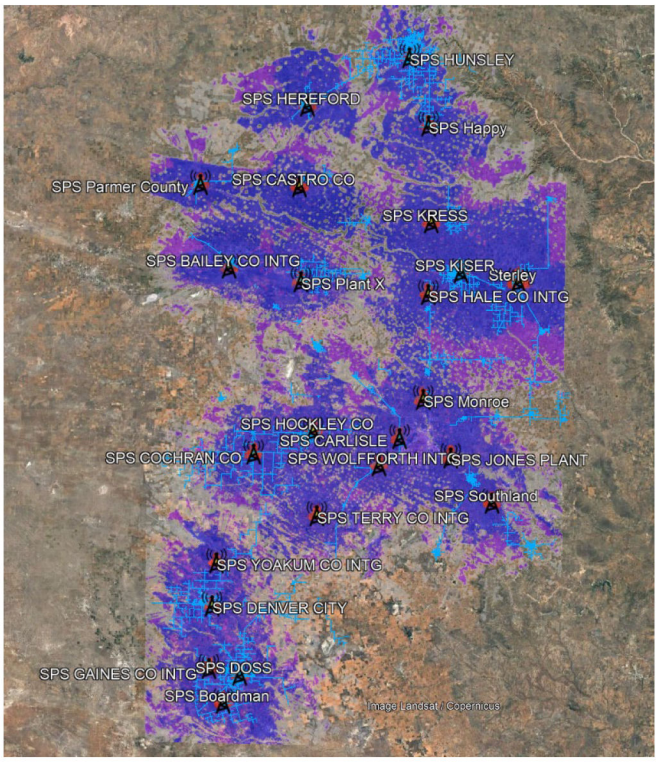


Figure 21 – Texas South



2.1.b Private Fiber Optic

Private fiber provides high-speed and reliable backhaul communication from pLTE towers to the core network. SPS will install OPGW, a type of private fiber optic cable, on transmission lines, terminating into RTUs at substations where pLTE towers are installed.

2.1.c RTU Installation

SPS will install RTUs where not already existing to enable data transmission to the control center. This work is necessitated by pLTE deployment and is incremental to SPS's existing OPGW and RTU installation plan.

3. Evidence of Effectiveness and Expected Benefits

The Resiliency Rule requires an SRP to "include evidence of the effectiveness of the measure in preventing, withstanding, mitigating, or more promptly recovering from the risks posed by the identified resiliency event."[63] Evidence that is quantitative, performance-based, or provided by an independent entity with relevant experience is afforded greater weight.[64] Further, the SRP must "explain the expected benefits of the resiliency measures including, as applicable, reduced system restoration costs, reduction in the frequency or duration of outages for customers, and any improvement in the overall service reliability for customers, including the classes of customers served and any critical load designations."[65]

SPS engaged 1898 & Co. to evaluate the effectiveness and expected benefits for the Communication Modernization measure.

The benefits of this measure are twofold: (1) it will make the SPS system more secure against cybersecurity risks and (2) it will unlock the full benefits of the communications-enabled protective devices installed under the Mainline Automated Reclosing Deployment program.

First, migrating communications from third-party cellular carriers to pLTE will make the SPS system more secure against cyber-attacks by allowing SPS to monitor and maintain control

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[63] 16 TAC § 25.62(c)(2)(A)(ii).

[64] *Id.*

[65] 16 TAC § 25.62(c)(2)(A)(iii).

over network access and data traffic. The pLTE network will also make the SPS system more secure by providing a third layer of redundancy for communications, in addition to the public cellular and private fiber networks, preventing any single event from disrupting system communications.

The Communication Modernization measure will also benefit customers by enabling the full benefits of the investments proposed under the Mainline Automated Reclosing Deployment program. SPS's ability to fully and effectively utilize communications-enabled protective devices requires the investment in a pLTE network. Accordingly, 1898 & Co. modeled the costs and benefits for the Communication Modernization measure and Mainline Automated Reclosing Deployment program together, calculating a combined BCR of 1.8. In other words, the customer benefits of combining the Mainline Automated Reclosing Deployment program and the Communication Modernization measure, including a reduction in the frequency or duration of outages, reduced system restoration costs, and improvement in general reliability, are almost double their combined investment costs.

In addition to these quantified benefits, the Communication Modernization measure will provide qualitative benefits for SPS customers, including protecting the SPS system against cybersecurity threats and reducing wildfire ignition risk by providing the communications required to remotely monitor and control field devices and remotely enable EPSS.

4. Proposed Implementation of Measure

The Resiliency Rule requires an SRP to include "implementation details for each of the plan's measures, including estimated capital costs, estimated operations and maintenance expenses, an estimated timeline for completion, and, when practicable and appropriate, estimated net salvage value (value of the retired asset less depreciation and cost of removal) and remaining service lives of any assets expected to be retired or replaced by resiliency-related investments."[66]

SPS will begin building out its pLTE and private fiber networks under this measure in 2025 and continue throughout the three-year implementation period. This is anticipated to include erecting 49 pLTE towers at existing SPS substations and microwave installations, stringing 83

[66] 16 TAC § 25.62(c)(2)(E).

miles of OPGW on existing transmission lines, installing 4 RTUs at existing SPS substations, and terminating the OPGW into the newly installed RTUs (6 terminations in total). The planned implementation schedule is provided in the table below.

Table 14 – Communication Modernization Implementation					
	2025	**2026**	**2027**	**2028**	**Total Plan**
PLTE Towers	0	16	15	18	49
OPGW Line Miles	0	7	44	32	83
RTU Installations	0	1	2	1	4
OPGW Terminations	0	2	2	2	6

The total estimated cost for the Communication Modernization measure is $112.6 million. There is no incremental O&M associated with the proposed Communication Modernization investments.

Table 15 – Communication Modernization Budget					
	2025	**2026**	**2027**	**2028**	**Total Plan**
Capital	$0M	$34.2M	$37.0M	$41.4M	$112.6M
O&M	$0M	$0M	$0M	$0M	$0M
Total Estimated Spend	$0M	$34.2M	$37.0M	$41.4M	$112.6M

*SPS does not currently anticipate incurring any costs for this measure in 2025. However, depending on the timing of SRP approval, SPS may begin initial engineering work in late 2025.

5. Metrics for Evaluating Effectiveness of Communication Modernization Measure

The Resiliency Rule requires that "[e]ach measure in the resiliency plan must include a proposed metric or criteria for evaluating the effectiveness of that measure in preventing, withstanding, mitigating, or more promptly recovering from the risks associated with the resiliency event it is designed to address."[67]

The metrics SPS proposes to evaluate the effectiveness of this measure are the completion of cellular tower construction and the connectivity of end devices on the cellular network. Please see Section V of this Plan for details on the evaluation metrics.

6. Reasonable Alternatives Considered

The Resiliency Rule requires that an SRP "explain the selection of each measure over any reasonable and readily-identifiable alternatives."[68]

There are few alternatives to a private network for communicating with field devices in areas with inadequate public cellular coverage. Installing repeaters to extend a public cellular signal is not scalable given the size of SPS's distribution system. Even if it were, the costs to connect each repeater and protective device connected to the network would likely make this option cost-prohibitive. Another alternative is to restrict SPS's deployment of communications-enabled protective devices to areas with adequate cellular coverage. This alternative is unacceptable because it would prevent SPS from providing many of its customers with the resiliency benefits of distribution automation and EPSS. Further, relying on third-party providers for OT communications is a less secure alternative for the reasons described above. SPS also considered partnering with public cellular providers for alternative solutions, but their solutions are still evolving and focus on usage/data plans, resulting in high O&M costs.

The only viable alternative to RTU installation is to install a cellular modem to connect each relay. This alternative would fail to capitalize on the existing OPGW infrastructure, is not

[67] 16 TAC § 25.62(c)(2)(C).

[68] 16 TAC § 25.62(c)(2)(A)(v).

financially viable, and would still require a public cellular network. There are no viable alternatives to OPGW backhaul.

7. Measure Distinction from Existing Programs

Pursuant to the Resiliency Rule, if a utility's resiliency plan measures are similar to programs and measures the utility is already implementing, the plan "must distinguish the measures in the resiliency plan from these programs and measures and, if appropriate, explain how the related items work in conjunction with one another."[69]

SPS has been deploying private fiber for communications between substations and control systems, as well as microwave installations for point-to-point communications for many years. These solutions provide a different set of capabilities from pLTE and neither can feasibly provide communications to field devices across the distribution system.

SPS currently relies on circuit-level communications and public cellular networks to enable communication between devices across most of its system. These solutions will continue to play a role in providing backup communications or communications in areas not covered by the pLTE network. The Communication Modernization measure is distinct from these approaches because it involves development of an integrated private communications network.

SPS recently began initial development of its pLTE network. One tower was recently activated and will begin connecting to devices in late 2024 or early 2025. The second tower is expected to be activated in 2025. These are the only two pLTE installations currently planned, and neither is included in the 49 towers proposed in the SRP. SPS is unlikely to build any additional towers outside of the SRP until at least 2029. A deployment at the scale proposed in the SRP would take many years beyond that.

8. Additional Information Required by the Resiliency Rule

The Resiliency Rule requires an SRP to state whether a measure (1) "is a coordinated effort with federal, state, or local government programs or may benefit from any federal, state, or local

[69] 16 TAC § 25.62(c)(2)(D).

government funding opportunity"[70] or if the measure (2) "may require a transmission system outage to implement."[71]

The Communication Modernization measure is not a coordinated effort with any federal, state, or local government program, and SPS will not benefit from any government funding opportunities in completing this work.

Installation of the OPGW will require transmission outages. The other activities within this measure should not require transmission outages. SPS commits to coordinate all outages with SPP.

D. Operational Flexibility

The Resiliency Rule requires that the resiliency plan "must be organized by measure" and include "a description of any activities, actions, standards, services, procedures, practices, structures, or equipment associated with each measure."[72] This section provides a description of the Operational Flexibility measure in compliance with that requirement of the Rule.

The Operational Flexibility measure consists of two programs that will make the SPS system more resilient by providing additional flexibility in managing power disruptions when an outage occurs. Under the Mobile Substation Equipment Procurement program, SPS will procure additional mobile substation equipment to enable quicker restoration of power during equipment failures at SPS substations. Under the Installation of Transmission Switches programs, SPS will install additional transmission switches to increase SPS's ability to sectionalize and isolate faults on the transmission system, reducing the customer impacts of outages and accelerating service restoration for customers by isolating damaged sections. These programs will allow SPS to mitigate and more promptly recover from outages caused by resiliency events.

1. Resiliency Events Mitigated

The Resiliency Rule requires that, for each measure, the utility must identify "one or more risks posed by resiliency events that the measure is intended to prevent, withstand, mitigate, or more

[70] 16 TAC § 25.62(c)(2)(A)(iv).

[71] 16 TAC § 25.62(c)(2)(A)(vi).

[72] 16 TAC § 25.62(c)(2).

promptly recover from."[73] This section identifies the resiliency events the Operational Flexibility measure is proposed to address.

The Operational Flexibility Measure is designed to mitigate and more promptly recover from the risks posed by weather-based resiliency events, including Wind, Flood, Tornado, Winter, Heat and Cold events. Specifically, this measure will address risks that result in outages on the transmission system and at SPS substations.

2. Description of Programs in the Operational Flexibility Measure

The Resiliency Rule requires that the resiliency plan "must be organized by measure" and include "a description of any activities, actions, standards, services, procedures, practices, structures, or equipment associated with each measure."[74] This section provides a description of the Overhead Hardening Measure in compliance with that requirement of the Rule.

The Operational Flexibility measure is comprised of two programs: Mobile Substation Equipment Procurement and Installation of Transmission Switches.

2.1 Description of Mobile Substation Equipment Procurement Program

SPS will procure additional mobile substation equipment to better ensure that adequate inventory is available across a variety of equipment types, voltage ratings, and capacity ratings to respond to a wide range of failures and events. Mobile substation equipment includes the transformers, circuit switchers, and voltage regulators that allow SPS to quickly respond to a substation outage while a permanent repair or replacement is undertaken. Mobile substation equipment is typically mounted on a trailer so that it can be mobilized and delivered to the site quickly.

Any weather-based resiliency event that damages a substation can potentially cause damage or destruction of the substation transformer. When this happens, mobile substation equipment is often the only means to quickly restore service to customers. This is particularly

[73] 16 TAC § 25.62(c)(2)(A).

[74] 16 TAC § 25.62(c)(2).

important for customers served from a single transformer, whose load cannot be transferred to an alternate substation.

Maintaining a sufficient supply of mobile substation equipment of the appropriate voltages and capacities allows SPS to restore service in the time it takes to deploy, connect, test, and energize the mobile unit—typically about 18-24 hours. Permanent repairs or replacements of substation transformers often take months to complete, and procurement lead times for substation transformers have increased significantly over the last several years. Lead times that were in the range of 10-18 months just a few years ago are now typically 24-36 months, resulting in longer timelines to plan a replacement for equipment once the replacement decision is made. Longer lead times mean a larger inventory of mobile substation equipment is necessary to provide the tools and flexibility needed to quickly respond to outages caused by resiliency events.

SPS already operates mobile substation equipment but has identified the need for additional equipment. Procuring the equipment proposed under this program will allow SPS to respond to resiliency events even when existing units are deployed for service restoration or capital projects. Over the past three years, SPS has employed an average of 20 mobile substation installations per year. This is up from previous years due to existing equipment age, material lead times, updates to employee safe-working distances, and other factors.

A larger fleet of mobile substation equipment will also support resiliency by increasing SPS's ability to complete the work proposed in this Plan efficiently and with minimal disruption to customers. Many of the substations proposed for investment under the SRP measures are islanded, without adequate ties to transfer the customer load to other assets. SPS will deploy mobile substation equipment to reduce the number of customer outages required to perform the work. For example, Van Buren Substation has four feeders identified for relay and breaker replacements as part of the Distribution System Protection Modernization measure. Mobile substation equipment will be required to efficiently complete the replacements and not introduce additional risk for customers while the work is completed.

Overall, increased mobile equipment quantities help ensure that SPS can respond to resiliency events quickly, can respond to more events—and more widespread events—