



2022 OPERATING PLAN

By the SPP Finance Department

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APPROACH

SPP's 2022 Operating Plan includes descriptions of the major work SPP will undertake to achieve its strategic plan, operate the organization and implement its mission. To carry out SPP's mission and the obligations set forth in its governing documents, SPP must plan and allocate its resources properly and thoroughly. SPP utilizes its robust stakeholder process to ensure accountability, transparency, fiscal responsibility and continuous improvement.

The 2022 Operating Plan outlines both corporate and departmental objectives to inform budget decisions for the coming fiscal year while acknowledging current business, financial, legislative and regulatory environments, which could impact ultimate delivery.

SPP reviews enterprise project requests and approves those that align with and support SPP's value propositions and strategic objectives. For the 2022-2024 budget planning cycle, SPP recommends a portfolio of 21 enterprise efforts for 2022.

SPP OVERVIEW

The SPP mission: Working together to responsibly and economically keep the lights on today and in the future.

SPP oversees the bulk electric grid and wholesale power market in the central United States on behalf of a diverse group of utilities and transmission companies in 17 states.

As a regional transmission organization (RTO), SPP ensures the reliable supply of power, adequate transmission infrastructure and competitive wholesale electricity prices for a 552,000-square-mile region, including more than 70,000 miles of high-voltage transmission lines in the Eastern Interconnection. SPP's services are independently provided on a regional basis, focused on electric reliability, cost-effectiveness and bringing value to SPP members and their customers.

Through SPP's portfolio of Western Energy Services, it also provides contract-based services such as reliability coordination and administration of a real-time balancing market to entities in the Western Interconnection.

SPP's staff of more than 650 professionals works proudly and diligently to ensure almost 19 million people across its service territories have electricity when they need it.

GOVERNING DOCUMENTS

TARIFF

The Federal Energy Regulatory Commission (FERC) directly regulates SPP. FERC must approve all changes to the SPP Open Access Transmission Tariff before implementation. SPP's failure to comply with tariff provisions and/or FERC directives must be reported to FERC and may be subject to penalties and fines.

The tariff defines the majority of the required workload for SPP's operations and engineering departments. Changes to the tariff are primarily within the oversight of the Market Operations Policy Committee (MOPC).

MEMBERSHIP AGREEMENT

The membership agreement is an agreement between SPP and each of its members that obligates SPP to perform outlined services, including those in the tariff. Changes to the scope of responsibilities are primarily within the purview of the MOPC and SPP's board of directors and Members Committee.

BYLAWS

The bylaws describe SPP's organizational operation, specifically outlining duties of the board and its advisory committees. Changes to the bylaws are under the oversight of the Corporate Governance Committee and board of directors.

PROTOCOLS AND BUSINESS PRACTICES

SPP has well-documented business practices detailing the administrative practices SPP follows in administering the tariff, including coordinating the sale of transmission service. SPP also has well-documented market protocols detailing how market participants and SPP are to interact. These documents are developed, monitored and amended through SPP's stakeholder process.

ORGANIZATIONAL STRUCTURE

SPP operates via two distinct organizational structures. The governance structure (Appendix A) begins with the board and cascades into board-level committees and working groups. This organizational structure is populated largely with representatives from SPP's member companies. These groups provide directives on the work SPP is expected to accomplish.

The internal staff structure (Appendix B) illustrates reporting relationships between employees. The staff structure begins with the SPP president and cascades into vice presidents, departmental directors/managers, etc. The staff structure is generally aligned based on functional responsibilities.

FUNDING

SPP funds its ongoing operating costs through charges to its customers under the tariff and customers of specific nontariff services. SPP's operating costs include scheduled principal and interest payments on its outstanding debt but exclude depreciation and amortization expenses. SPP's tariff allows the company to collect up to 100% of its operating costs from a combination of four unique rate schedules charged to its customers.

Under SPP's FERC-filed and approved formula rate design, transmission customers are charged for system dispatch and control costs; auction revenue rights and transmission congestion rights holders are charged for costs to operate the congestion rights markets; generation, load and financial-only participants are charged the common costs to administer the energy markets; and generation and load participants are charged the costs to operate the physical energy markets.

SPP's capital expenditures are funded with borrowings from periodic debt issuances and with 20% equity allocation included in the annual net revenue requirement. SPP's debt issuances are generally unsecured. These issuances have a one-to-two year, interest-only payment period and then fully amortize by the maturity of the notes. SPP is required to obtain regulatory approvals before issuing new debt.

SPP's A rating from Fitch Ratings was last affirmed November 2020. SPP issued notes in August 2018 to fund capital expenditures incurred through 2023. The SPP board authorized the issuance of additional notes in April 2021. It expects these notes to fund in the fourth quarter of 2021.

Managing SPP's cash flow provides short-term liquidity. SPP has a committed \$30 million revolving credit facility with a commercial bank to provide additional liquidity support.

2022 EXPECTED BUSINESS ENVIRONMENT

Some of the opportunities and challenges affecting SPP are related to continued electrification, changing generation mix, transmission planning and cost allocation, evolving energy markets, expansion of SPP services to the west, regulatory issues and cybersecurity risks. The full impact of the February 2021 Winter Weather Event on SPP is the subject of a comprehensive review commissioned by the SPP board of directors. This review is anticipated to identify several opportunities to improve SPP systems and processes.

ELECTRIFICATION

Many projections show U.S. energy consumption will continue to decline, while overall electricity use is expected to increase with technologies such as electric cars and heat pumps. SPP anticipates continued growth in its members' demand response and energy efficiency programs. Over time, these changes will likely cause lower summer peaks, higher winter peaks and a flattening of load shapes due to an annual normalization of electricity use. Consumers will have more choices about how they use energy and interact with the electric grid. While major changes may not materialize over the next year, SPP is incorporating more of these evolving assumptions in its engineering models.

While load in the SPP region has been flat overall for the last several years, there are pockets of load growth. Commercial and industrial customers seeking low-cost, renewable service options are increasingly attracted to the SPP region. Companies such as Google, T-Mobile USA and Facebook have contracted with renewable generators in the SPP footprint to power their data centers or meet carbon emission reduction goals.

CHANGING GENERATION MIX

The generation fleet at SPP's disposal — more than 800 generators participating in its markets — has changed dramatically in the last 10 years. SPP's current generation fuel mix is primarily wind, coal and gas. Coal has been on a continual decline in production and capacity since 2014. No new coal generation is planned, and older plants are being or projected to be retired.

The SPP region has seen a significant increase in renewable energy. In 2008, wind energy made up just 3% and solar a fraction of a percent of SPP's annual energy production. In 2020, wind comprised 31.3% and solar 0.2%. At a given moment, SPP has reliably met as much as 84% of its load with wind. SPP's primary operational challenge is maintaining grid reliability as it becomes increasingly dependent on energy delivered from intermittent resources. The generator interconnection (GI) queue represents new generators "waiting in line" to be analyzed and

connected to the transmission system. Of the more than 84 gigawatts (GW) of pending generator interconnection requests, over 80% is renewable resources.

TRANSMISSION PLANNING AND COST ALLOCATION

Every year SPP works with its members to determine the region's new transmission needs. These projects benefit the region by connecting new generators and demand sources to the transmission system, ensuring low-cost electricity is delivered to consumers and solving power grid issues that, if not addressed, could impact the reliable delivery of electricity.

Determining who should pay for transmission upgrades is a highly debated public policy issue. SPP is challenged to better align its transmission planning processes, Integrated Marketplace and transmission cost allocation methodologies. It is important to address the cost responsibility of loads and generators as well as cost allocation among loads.

Additional future challenges are based on the changing generation mix, including how storage can be used for both transmission reliability and to provide economic benefits through the markets. As load also starts to respond to either reliability needs or economic benefits through the markets, planning will increase in complexity, because load will no longer just be a forecasted demand.

EVOLVING ENERGY MARKETS

Wind — which has zero fuel cost and enjoys significant federal tax incentives — coupled with low natural gas prices continues to enable an economic dispatch of SPP's changing generating fleet that reduces wholesale energy prices and shifts the region away from traditional generation. This economic dispatch is feasible due to SPP's robust transmission system investment and Integrated Marketplace. The Integrated Marketplace has provided more than \$3.5 billion in savings since it launched in 2014.

In 2020, SPP's spot wholesale energy prices remained the lowest in any organized market. SPP's primary financial challenge is ensuring that, given declining wholesale energy prices, resources capable of providing reliability are appropriately compensated and incentivized to offer and deliver these services to the grid. SPP continuously works with stakeholders to enhance the Integrated Marketplace's ability to cost effectively utilize its diverse generation mix, manage grid congestion and reliably respond to changes in load and generation.

WESTERN ENERGY SERVICES

SPP began operating in the Western Interconnection as a North American Electric Reliability Corporation (NERC)-certified reliability coordinator in December 2019, working with customers to keep the lights on and mitigate operational contingencies that threaten reliability. In February 2021, SPP launched its Western Energy Imbalance Service market and administers it on a

contract basis. The market centrally dispatches energy from participating resources every five minutes, enhancing reliability and affordability for western consumers.

In November 2020, SPP announced several utilities would evaluate the benefits of placing western facilities under the terms and conditions of SPP's Open Access Transmission Tariff. An SPP-commissioned study found the move would be mutually beneficial and produce annual savings for both eastern and western members. Additionally, SPP anticipates its wholesale electricity market, resource adequacy program and other regionalized services can help western members achieve renewable-energy goals, reinforce system reliability and leverage new opportunities to buy, sell and trade power.

The interested utilities are working with SPP to evaluate the terms, costs and benefits of putting western facilities under the RTO's tariff. Membership agreements are projected to be executed in 2022.

FEDERAL AND STATE ENERGY POLICIES

SPP regularly monitors and analyzes proposed federal and state legislative actions and determines the potential impact on SPP and its members and stakeholders. At the federal level, SPP has observed broad energy policy trends toward increased renewables, storage development, grid and cybersecurity and electric infrastructure development. Historically, comprehensive federal energy legislation has been slow to become law. The pace at which regulatory rulemakings have been issued also appears to have slowed, with finalized actions often facing lengthy subsequent court challenges.

At the state level, legislative changes happen more quickly. Hundreds of energy-related bills become law each year across the country. These state-level changes both reflect and drive energy development and investment trends. SPP has seen state energy policy trends similar to that at the federal level, as well as continued interest in renewable portfolio standards, retail choice, RTO participation and right of first refusal laws.

Federal and state energy policy trends toward increased renewables, storage development, cybersecurity and grid security and modernization are likely to continue in the coming years. Additionally, as states continue to increase their renewable energy goals and reduce their greenhouse gas emissions, interest in advanced transmission systems, RTOs and possibly even retail choice could continue to grow. The public utilities and large private corporations are also likely to advance policy through independent actions.

REGULATORY

The regulatory department has four main priorities: tariff administration, outreach (federal and state), education and monitoring of regulatory agencies (federal and state). Due to SPP's anticipated growth, the increasing number of new FERC initiatives, required changes to SPP's Open Access Transmission Tariff and tariff administration responsibilities have been steadily

increasing. SPP combines outreach, education and monitoring efforts with FERC, state commissions and other interested stakeholders.

In addition to facilitating the important work of the Regional State Committee and the Cost Allocation Working Group, SPP provides presentations to state commissions within the footprint to ensure they are aware of current SPP activities. The turnover on state commissions is high, requiring SPP to be constantly engaged in education efforts of new members. In addition, SPP's proposed expansion to the Western Interconnection has increased the number of states to monitor. SPP is engaged in outreach to the four states where expansion is currently proposed (Montana, Utah, Colorado and Wyoming) while educating interested entities and other western state commissions on SPP's Western Energy Services.

SPP's responsibilities for outreach, education and monitoring on the federal level are focused on FERC. The election of the Biden administration has brought leadership and priority changes to FERC. In the past six months, the commission has two new members (Commissioner Christie and Commissioner Clements), a new chair (Chairman Glick) and another open seat possible in 2021. FERC Chair Glick has acknowledged that, while FERC operates outside the direction of the president and the other offices of the executive branch, the administration has made a high priority of addressing greenhouse gas emissions and climate change. Glick stated his goal is "to carry out [FERC] responsibilities, which ... leads to reducing greenhouse gas emissions." He stated he would accomplish this goal by focusing on the efficiency of electricity markets and eliminating barriers for newer technologies, such as wind, solar, energy storage and other clean energy technologies. Glick also noted that through FERC's "significant control" over the interstate electric transmission system, another of his goals is "simply to facilitate greater investment in electric transmission." He is looking at how FERC could help improve the interregional transmission planning process and allow for more regional cost allocation of long-distance transmission lines.

CYBERSECURITY RISKS

The threat of ransomware attacks will continue to pose the greatest cyber-related risk to both SPP and all critical infrastructure. SPP will remain focused on advancing its cybersecurity maturity by becoming more secure, vigilant and resilient. The expanding number of threats and threat actors dictates SPP take a proactive view of the advanced threat landscape.

SPP will seek to incorporate threat intelligence that highlights not only technical vulnerabilities but also economic, legal and geopolitical factors as well. SPP will continue to manage cyber risk across the enterprise and up through the supply chain by enhancing its procurement practices with specific vendor cyber risk assessments. SPP will remain committed to identifying and deploying new technologies that will assist in monitoring and detecting anomalies on networks, thereby reducing SPP's overall corporate cyber risk.

CORPORATE AND DEPARTMENTAL 2022 OBJECTIVES

CORPORATE OBJECTIVES

DIVERSITY, EQUITY & INCLUSION (DEI) ADVANCEMENT

A more diverse, equitable and inclusive SPP is about doing the right thing, for the right reason, in the right way. It is also about enhancing SPP's competitive edge in the marketplace for human capital. With these values in mind, SPP made significant steps in advancing its diversity, equity and inclusion (DEI) strategy in 2021. SPP executives approved the charter of the DEI council who will provide oversight, guidance and leadership in the implementation and maintenance of SPP's DEI initiatives.

Another milestone in this initiative is the establishment of business resource groups (BRG). These voluntary, employee-led organizations are composed of employees who share common characteristics and interests with the purpose of fostering a diverse, inclusive workplace aligned with SPP's mission, values, goals, business practices and objectives.

PROMOD REPLACEMENT/UPGRADE

The PROMOD replacement project upgrades the transmission planning adjust production cost software to PROMOD IV. This software upgrade will improve performance, member value and affordability. Staff will have a better toolset to help maintain an economical and optimized transmission system. This upgrade to the PROMOD application is tied to two recommendations from the holistic integrated tariff team (HITT). They are S1 to add technological advances and S2 to include seams, both in support of SPP's strategic plan.

Implementation of the PROMOD upgrade will include procurement, benchmarking with the new and old software, installation, integrations, substantial automation updates required for compatibility and process improvements, testing and process documentation. Automation updates tied to this upgrade are critical to successful implementation.

WINTER WEATHER EVENT IMPROVEMENTS

SPP experienced the most operationally challenging week in its 80-year history the week of Feb. 14-20, 2021. SPP's board of directors approved a plan to assess SPP's performance and that of its member utilities during the February 2021 winter weather event. SPP will evaluate operational, financial, communications and other factors related to the events of the February

winter storm. SPP will present its assessment and recommendations at the July 27, 2021, meeting of the SPP board of directors and members committee. Upon the board's approval, recommendations for improvement will be completed, beginning with the 2022 SPP comprehensive roadmap.

SCRIPT IMPLEMENTATION/DEVELOPMENT

SPP established the strategic and creative re-engineering of integrated planning team (SCRIPT) Aug. 31, 2020, to holistically evaluate all transmission planning and applicable cost allocation processes used in SPP, consider and evaluate options to strategically reengineer those processes and finalize a report with high-level recommendations to the board and members committee for improvements. At its May 2021 meeting, the SCRIPT approved a set of policy recommendations designed to help address SPP's multiyear backlog of generator interconnection requests. Once approved by SPP's Board and FERC, it is expected these policies will be implemented beginning in 2022 with the backlog expected to be cleared by the end of 2024. SPP expects the SCRIPT to complete its work by October 2021, with a number of policy recommendations that will be implemented over the next three-year budget cycle.

REGIONAL COST ALLOCATION REVIEW (RCAR) III

In 2021, SPP will re-engage the regional allocation review task force (RARTF), as required by the tariff, to plan and finalize methodology for the RCAR III study that must be completed in 2022 per Attachment J of the SPP tariff. This RCAR III study will be the first to utilize operational market data for the majority of the highway/byway project analysis while supplementing the remaining projects' analysis utilizing planning models and assumptions.

ORDER 2222 DEVELOPMENT

FERC Order No. 2222 helps usher in the electric grid of the future and promotes competition in electric markets by removing the barriers preventing distributed energy resources (DERs) from competing on a level playing field in the organized capacity, energy and ancillary services markets. SPP will have governing language, process/procedures and significant application/tool changes necessary to facilitate not only compliance with the order, but the design to help ensure future enhancements better optimize the value of DERs. SPP anticipates this project will require substantial technology resources and effort to develop and implement.

SPP will develop and file tariff changes with FERC by the first quarter 2022 to support resources on the distribution grid. It anticipates implementation of the system and procedure changes to both operations and planning by 2024. The changes include communication with the distribution utility and other entities within the SPP market footprint previously not engaged with SPP, potential changes to demand response processes and tariff language and the aggregation of individual DERs into a single resource.

20-YEAR ASSESSMENT

The objective of the 20-year assessment is to develop a long-range, extra high-voltage, 300 kV and above transmission roadmap for the SPP region. The assessment will result in the identification of projects that economically deliver energy within the SPP region while addressing a reasonable range of future industry uncertainty. The resulting library of projects will provide a source of candidate projects that will inform shorter-term planning assessments for injecting longer-term vision into those assessments. The SPP tariff requires completion of a 20-year assessment every five years. 2022 is the last year in the current five-year cycle.

WESTERN EXPANSION

SPP expects two initiatives to gain momentum in 2022. First, several utilities are evaluating the benefits of placing western transmission facilities and load under the terms and conditions of SPP's Open Access Transmission Tariff. The interested utilities are working with SPP to evaluate the terms, costs and benefits of this action. SPP projects these membership agreements will be executed in 2022.

Secondly, SPP is expecting to work with the Northwest Power Pool ("NWPP") in the implementation and subsequent operation of a resource adequacy program for entities affiliated with the Northwest Power Pool ("NWPP"). NWPP is comprised of vertically integrated utilities and generation-only entities, including independent power producers. Smaller load-serving entities that do not own generation generally participate indirectly through the NWPP member system with which they are interconnected. The NWPP membership includes several large utilities in the Pacific Northwest and Canada, including Bonneville Power Administration, Western Area Power Administration, Northwestern Energy, PacifiCorp, Xcel Energy, British Columbia Hydro and Alberta Independent System Operator. The entities are located in the Western Interconnection and are under the jurisdiction of the Western Electricity Coordinating Council (WECC) Regional Entity. NWPP is registered with the North American Reliability Corporation (NERC) as a Reserve Sharing Group (RSG).

IT STORAGE CAPACITY

Demand for storage continues to grow at a high rate. Well-functioning applications and services demand increasing amounts of detailed data. Responsive data retrieval, storage processes and data management are essential to meet user needs and maintain affordability. The storage capacity planning strategy includes assessments of current capacity and areas where capacity can be optimized, future capacity requirements, performance metrics and capacity planning tools. SPP will use this information to formulate actionable recommendations to support capacity needs now and in the future.

HITT RECOMMENDATIONS IMPLEMENTATION

HITT was created to comprehensively review SPP's cost allocation model, transmission planning processes, integrated marketplace services and disconnects or synergies between planning and real-time reliability and economic operations. SPP released the resulting recommendations in July 2019, which consist of items for continual study and evaluation and specific implementations to address the issues considered by the HITT. SPP organized the group's 21 recommendations (actually 26 action items) into the HITT program, and a schedule for staff actions and working group consideration. As of June 2021, SPP has completed 16 initiatives, and expect to complete the remaining efforts by October 2022.

Z2

SPP has two significant legal and regulatory activities underway related to Z2, and one does not have a definitive resolution date due to its legal and/or regulatory track with timelines set by the courts. Legacy Z2 resettlement is on appeal to the D.C. Circuit Court of Appeals. SPP's objective is to participate in the legal process and drive toward a resolution that complies with court and FERC orders. FERC approved revisions to Attachment Z2 effective July 1, 2020, to specify that upgrade sponsors are no longer eligible for transmission revenue credits for new network upgrades.

SEAMS DEVELOPMENT

Throughout the remainder of 2021 and the first half of 2022, SPP expects to coordinate with neighboring transmission planning authorities, transmission service providers, reliability coordinators, and market operators to form seams development plans. These plans will identify mutually agreeable opportunities to reduce seams boundaries, primarily in the operations and planning realms, in order to create additional value for SPP and its respective neighbors.

SPP and MISO began performance of Joint Targeted Interconnection Queue Study in 2021. While that study is expected to be completed by the end of 2021, it is expected that any necessary regulatory development and FERC filings will take place in early 2022.

GRID OF THE FUTURE

SPP expects to begin work on its Grid of the Future strategic opportunity in late 2021 with efforts increasing in early 2022 and continuing throughout the majority of the year. The bulk of this work in 2022 is expected to consist of establishment of a complementary stakeholder group, evaluation of future opportunities and threats, and reporting on conclusions and needed capabilities, tools, and processes.

DEPARTMENTAL OBJECTIVES

Additional details associated with the departmental impact to meet the aforementioned corporate objectives are included in the following departmental objectives.

OPERATIONS

SPP STRATEGIC ROADMAP

In 2020, efforts commenced to develop the SPP's strategic roadmap process. This process allows SPP staff and stakeholders to identify, develop and prioritize initiatives that enhance SPP's reliability capabilities by improving existing tools and processes and developing new ones. Certain initiatives aim to increase reliability and reduce compliance risk through improved congestion management practices, while others address opportunities to utilize the existing grid more efficiently through practices like dynamic line ratings and topology optimization. Another initiative focuses on continued improvement and seeks to evaluate the reliability metrics and assumptions used in SPP's generation assessment process with the goal of ensuring appropriate risks and reliability margins for outage coordination. This roadmap process increases transparency and collaboration, while prioritizing focus on areas with the greatest need.

INTEGRATING NEW TOOLS

The transient security assessment tool (TSAT) is part of the dynamic security assessment suite of tools and has been in production since August 2019. Additional validation of results is ongoing to ensure results are accurate and concise and can be trusted for real-time decision making. TSAT provides operators a time domain analysis to determine the impacts of a fault on the transmission grid. The tool assists SPP personnel in protecting grid reliability for transient instability. SPP will continue to evaluate the accuracy and effectiveness of TSAT. Based on future transmission system conditions, SPP will add new TSAT scenarios as necessary.

Operations is prototyping the Strategic Energy and Risk Valuation Model (SERVM) tool that is utilized in the resource assessment process by planning to deploy more sophisticated statistical analysis in the generation outage process. As referenced in the strategic roadmap section above, SPP continues to improve its outage coordination process. Work has focused on refining the generation assessment process by ensuring the statistical analysis employed is accurate and suitable. Staff is focusing on benchmarking toward historical analysis and implementing new statistical tools and methods.

2021 WINTER WEATHER EVENT

SPP is working on a coordinated response to the 2021 winter weather event geared toward continuous improvement. The comprehensive review steering committee has engaged multiple stakeholder groups to perform a comprehensive review of the event with the goal of making recommendations for improvement as part of the lessons learned effort. While this work is

ongoing, these SPP anticipates recommendations to identify opportunities for improvement in the following areas:

- **Operational aspects:** Operating conditions leading up to and during the event
- **Communication:** Effectiveness of communications between SPP and member operating staff before and during the event
- **Load-shed approach:** Effectiveness of load-shed strategy
- **Import strategy:** Use of imports, their impact on congestion, and SPP resources and opportunities to improve the strategy in future events
- **Seasonal planning:** Effectiveness of winter preparedness
- **Training:** Evaluation of TOP and SPP operator training and preparedness
- **BA and RC operator tools:** Effectiveness of tools
- **BA and RC processes and procedures:** Effectiveness of processes/procedures

As such, each of these improvement areas will be a large part of the SPP operations roadmap for 2022 and beyond.

MARKETS AND RELIABILITY TRAINING SIMULATOR (MRTS)

In 2016, SPP launched a multiyear project to upgrade its dispatcher training simulator (DTS) to a markets and reliability training simulator (MRTS). SPP is working with an external vendor to create a full training and testing simulated environment that performs more closely to real-time production systems. Development is ongoing throughout 2021 and the first two phases are complete. The next phase of the project is the implementation and testing of all software. The completed MRTS will provide realistic simulation training using market systems imperative for SPP operator readiness and increased reliability. This will improve operator training and greatly enhance support of reliability coordination, balancing authority and market operations.

EXPAND AND IMPROVE MARKET FUNCTIONALITY

SPP's footprint continues to see increasing amounts of variable generation penetration. As the grid shifts to a generation fleet with more renewable resources, there are many times when the majority of the day's planned operating capacity is available from a forecastable resource. Due to changes in temperature, humidity, cloud cover and human behavior, these resource forecasts are not always accurate. This phenomenon can lead to SPP relying on capacity that will not actually be supplying energy when needed to meet demand. SPP is working to develop an uncertainty product that accounts for uncertainty in energy production from available capacity to ensure there is enough capacity to be committed to produce energy during these events. The time horizons for this product development have not been determined. Other markets have addressed this issue with products in the 30-minute time horizon. In SPP's analyses to date, results look promising for one or more products in time ranges of up to four hours. The working groups are analyzing the results of SPP's study on uncertainty and are working to develop this product to ensure it meets the needs of SPP and the market.

SPP is developing a ramping capability product to ensure it has enough ramping capability to address potential wind forecast errors and address SPP members and the SPP market monitor concerns SPP's real-time prices are overly volatile due to scarcity pricing. Ramping capability of resources is an essential component of efficiently and economically meeting the energy needs of SPP's market participants. A resource's asset age and technology has impact on its ability to ramp. The SPP market does not directly value the ability to perform ramping functions. This could potentially result in new technology ignoring ramp as a valued product and older assets not necessarily optimizing their offers or maintenance to produce enough ramping capability to meet the region's needs. With the continuing development of forecastable resources, the ability to procure and value excess ramping capability to handle potential errors in renewable forecasts will help ensure a stable, reliable and economic grid for SPP and its members. SPP filed revision request (361 Ramping Capability) with FERC April 21, 2020, and is awaiting the response to begin implementation planning.

Another area of SPP focus to improve and expand market functionality is on fast-start resources. Fast-start resources are essential to the reliable provision of energy. These resources typically have short startup times, low minimum run-time requirements and faster than average ramp rates. These characteristics provide the needed flexibility for managing the operational challenges SPP faces. Although the need for fast-start resources could potentially decrease with the implementation of ramp market products, SPP anticipates continuing to encounter unforeseen circumstances that will require a fast-start market product/service. While SPP has a participation model for fast-start resources, many market participants believe the model's compensation principles are lacking and do not adequately incent participation of fast-start resources. FERC and some stakeholders are concerned about the inclusion of startup and no-load costs into the locational marginal price (LMP) calculation. SPP and its stakeholders have initiated fast-start market product enhancements in the form of RR 375 (FERC Order on Fast-Start Pricing) (filed at FERC and awaiting response) and RR 402 (HITT R3 (Fast-Start Resources) - Enhanced Intra-Day Reliability Unit Commitment) (approved at MWG) and expect to implement these changes after gaining approval from FERC.

The SPP board approved HITT M1 (Improve Congestion Hedging) in July 2019 and directed the market working group to write a policy paper to use counterflow optimization in the auction revenue rights (ARR) allocation. Based on the market rules already in place, there is no use of un-nominated ARRs in SPP's annual ARR allocation. These un-nominated ARRs are often counterflow ARRs, which means these ARRs are a cost-to-the-market participant. SPP has contracted with a consultant to perform the analysis and provide a recommendation to the Strategic Planning Committee (SPC) in 2021.

INFORMATION TECHNOLOGY

The mission of IT is to provide value, in partnership with our stakeholders, through continuous innovation, technology transformation, reliable platforms and excellent customer support. IT leads and supports work for every department within SPP. The IT ecosystem is constantly in flux

to respond quickly to business needs as well as reliability, security, compliance and financial risks.

The major areas of IT focus for 2022 are:

- Risk management
- Quality and efficiency
- Technology and process support
- Affordability

RISK MANAGEMENT

SPP is enhancing security efforts in accordance with its IT cybersecurity architecture roadmap. This work includes:

- Improving vulnerability assessment practices through enhanced scans and assessing all results for any necessary mitigation. This will provide a more detailed analysis of vulnerabilities present in SPP's network and allow for a more focused approach in assessing the risks posed by those vulnerabilities.
- Continuing the implementation of an identity and access management system by finalizing the rollout of SPP's existing identity and access management software product as SPP's identity analytics solution. This system will ensure that users have only the access privileges needed, thereby increasing security and lowering risk.
- Strengthening SPP's information management program by establishing a data governance program. Several projects are being sponsored and prioritized, including hardening sensitive data definitions, updating and enforcing data retention policies, implementing a data-loss prevention platform to prevent sensitive data from being stored in inappropriate locations and tracing the flow of sensitive information through the SPP infrastructure.
- Streamlining intra- and interdepartmental efforts associated with NERC standard CIP-013-1 (supply chain risk management), which helps SPP mitigate identified and potential cybersecurity risks to bulk electric system cyber assets.
- Addressing the 2021 FERC audit findings.
- Implementing, as appropriate, recommendations derived from the cybersecurity strategy assessment conducted by a third-party information security company.

QUALITY AND EFFICIENCY

As the needs of the business change, IT continues to partner with stakeholders across the business to create and implement collaborative solutions that are focused on continuous improvement and efficiency.

Automating the following solutions will reduce the opportunity for human error and related compliance and security risks.

- Patch assessments of security and nonsecurity patches issued by third-party software providers, most of which are driven by critical infrastructure protection (CIP) requirements.
- CIP physical and virtual server builds and decommissions.
- CIP audit evidence collection.

Initiating the following work will increase efficiency.

- Implementing cloud-like infrastructure on premises.
- Standardizing processes and platforms to reduce the SPP software stack, increase efficiency and automation and reduce the time and expense associated with licensing, support and maintenance.
- Re-engineering the hardware, software and services procurement process to clarify and consolidate the various paths by which hardware and software are acquired today, ensure adequate architectural and security oversight and maintain auditable compliance with CIP-010-1 and CIP-013-requirements.

TECHNOLOGY AND PROCESS SUPPORT

SPP continues to evaluate and appropriately implement new technologies that optimize current functionality and add new required functionality. It is prudent for IT to maintain awareness of these evolving technologies with an eye toward integrating them into the SPP infrastructure in support of SPP's strategic initiative of driving value beyond reliability.

- IT is evaluating cloud-based solutions that could allow for more flexibility and efficiency while reducing equipment purchases by delegating responsibility for certain parts of the infrastructure outside of SPP. IT is working with stakeholders and industry analysts to develop a strategy for managing cloud-based security risk as part of its comprehensive risk management program.
- IT is pursuing a strategy of de-coupling SPP's infrastructure stack. Rather than supporting custom software running on custom hardware, SPP is moving toward a common underlying layer of physical components that can be dynamically reconfigured to support business needs. This common physical layer across multiple applications decreases the effort and risks of supporting multiple custom configurations and allows the same physical resources to be leveraged by many applications as needed.

AFFORDABILITY

Physical technology assets (servers, hosts, storage devices and networking equipment) comprise approximately \$42 million of capital hardware inventory. SPP must replace these physical assets on a periodic basis due to technical obsolescence that creates exposure to increased hardware failure rates, discontinued or unaffordable vendor support, operating system incompatibility and the need for improved application performance and connectivity requirements.

In addition to SPP's hardware portfolio, the IT department supports roughly \$160 million of software applications, tools and security products requiring continuous upkeep related to security patches, product upgrades and integration efforts to ensure compatibility across products and systems.

An asset inventory management program is being evaluated by the enterprise architecture group that will reduce exposure to contractual noncompliance fines, reduce risk of purchasing multiple overlapping technologies, reduce risk of infrastructure getting to end of support and expense reduction of automating a manual and error-prone task.

IT will begin research into a cost allocation "show-back" process that will allow SPP staff and stakeholders a more granular view of costs associated with a particular business function or project. This process will provide SPP's analytical oversight of member financial resources additional transparency and education of total costs to support a particular system. SPP expects this effort to take a maximum of three years to implement.

FINANCE

EMERGENCY MANAGEMENT

As SPP emerges from the COVID-19 pandemic, it will look to enhance its emergency management plans based on lessons learned from the pandemic and industry best practices. Additionally, the SPP will update its business continuity plans to accommodate each department's impacts due to adoption of a hybrid work environment. These activities will better prepare SPP to provide its suite of services under extreme conditions, with limited access to facilities or assets and with a workforce that may provide critical services from a remote workplace.

CREDIT POLICY

The 2021 winter storm event and its subsequent documentation provided valuable information to SPP's credit team and its external stakeholders. The Credit Practices Working Group will review and analyze this data and may recommend prudent amendments to the credit policy and tariff.

ENGINEERING

GENERATION INTERCONNECTION (GI) PROCESS

In 2019, the new three-phase GI study process was approved by FERC and was implemented beginning with the DISIS 2017-001 Cluster Study. SPP staff, SPP members and interconnection customers spent much of 2021 working together with the SCRIPT to adjust the three-phase DISIS study with the objective to accelerate the clearing of the GI backlog of almost 558 requests (more than 100 GW). Special studies (affected systems, modification, interim, limited

operations, surplus, ILTCR) now consists of a backlog of approximately 100 studies that must be performed over the next year. This high volume of special studies is expected to continue until the GI backlog has been cleared.

The generation interconnection user forum ("GIUF") was established to educate stakeholders and to identify process improvements to facilitate clearing of the GI queue backlog. An average of 100 people attend the GIUF meeting each month, and Hybrid facility requests (combinations of different types of resources) are becoming more prevalent which will require the adoption of new study procedures and policies to address the unique aspects of hybrid facilities. The generator replacement process was added to Attachment V of the tariff in 2020. This is a procedure to expedite processing of a request to replace an existing generating facility with a replacement generating facility without going through the full DISIS study process.

RESOURCE ADEQUACY PROCESS

In 2018, FERC approved new tariff provisions regarding resource adequacy, which SPP began implementing in 2019. Foremost are a new enforcement process and enhanced data collection and monitoring provisions that ensure load-responsible entities are planning sufficient resource capacity.

The Supply Adequacy Working Group is addressing many initiatives and policies regarding accreditation for wind, solar, storage and hybrid resources. SPP has targeted the new wind and solar accreditation policy and governing documents for MOPC approval in late 2021. SPP has targeted the stand-alone battery accreditation policy and governing documents for MOPC approval in 2022 because the hybrid accreditation is still being developed. Additionally, resource adequacy staff is facilitating changes to conventional generation accreditation based on historical performance.

In response to the 2021 winter weather event, resource adequacy has a number of recommendations and initiatives to investigate and implement within the 2022-2024 period. The initiatives include exploring fuel assurance measures for generating capacity, putting more focus on winter preparedness for generating capacity, studying the need for a separate winter season planning reserve margin and exploring the need to account for extreme weather events that may occur in the future.

TRANSMISSION PLANNING

The transmission planning and interregional coordination teams will be working with MISO to perform a coordinated system plan in 2022. This study is performed as part of the 2022 Integrated Transmission Plan and a hopeful outcome will include seams-related transmission projects. A coordinated system plan with AECL is targeted for 2022 as well.

Transmission planning will lead or support six of 22 projects slated for 2022 including: DERs FERC Order 2222, Electric Storage Resources/Hybrids, SCRIPT, HITT (T1), ProMod upgrade, and West RTO.

PROCESS INTEGRITY

NERC AND NAESB STANDARDS

In 2022, SPP process integrity will work with stakeholders to pass a maximum of three new standards at NERC and one at the North American Energy Standards Board (NAESB) to address new technologies. Process integrity will take advantage of opportunities at NERC, NAESB, the ISO RTO Council and FERC to advocate or sponsor projects to improve standards and practices that will make improvements tied to the corporate efforts under winter weather events.

CUSTOMER SERVICES

To assist our stakeholders in managing the impact of travel-related costs, SPP will offer 2022 training deliverables virtually when deemed appropriate. Virtual training will account for more than half of 2022 deliveries. SPP will evaluate in-person training to ensure the impact of travel-related costs (e.g., travel expenses and overtime) are kept to a minimum.

SPP's customer training provides approximately 500 NERC credential maintenance hours to ensure stakeholder operators have access to a minimum of 70 continuing education hours. This strategically aligns with their three-year reliability coordinator NERC certification renewal requirements. All SPP market enhancement training, system modifications and processes/protocol updates requiring education will be facilitated virtually before implementation. Specifically, 2022 customer training deliverables will include:

- 2021 winter event recommendations and identified improvements
- PROMOD replacement/upgrade education
- SCRIPT implementation/development education
- HIIT adoption/implementation education
- FERC Order No. 2222 education
- RTO West education

2022 PROJECTS

SPP’s project review and prioritization committee (PRPC) reviews enterprise project requests and approves those that align with and support SPP value propositions and strategic objectives. Generally, business owners develop business cases, with the support of the PMO and the sponsoring director. In some cases, the PRPC recognizes that while it is too early to submit a detailed business case, there is awareness of looming enterprise efforts that will require coordinated planning and accordingly will have an impact on resources available for project work. In that case, the PRPC has included such efforts even when a business owner has not submitted a business case for consideration. For the 2022-2024 budget planning cycle, the PRPC recommends a portfolio of 21 enterprise efforts for 2022.

2022-2024 LIST OF PRIORITIZED PROJECTS/ PROGRAMS

SPP classifies projects (or in some cases programs) in the following descriptive categories:

- **Previous:** projects previously prioritized, including two with updated business cases
- **New:** new submissions with estimated scope, budget and/or timelines
- **Unknown:** submissions with unknown scope, budget and timelines

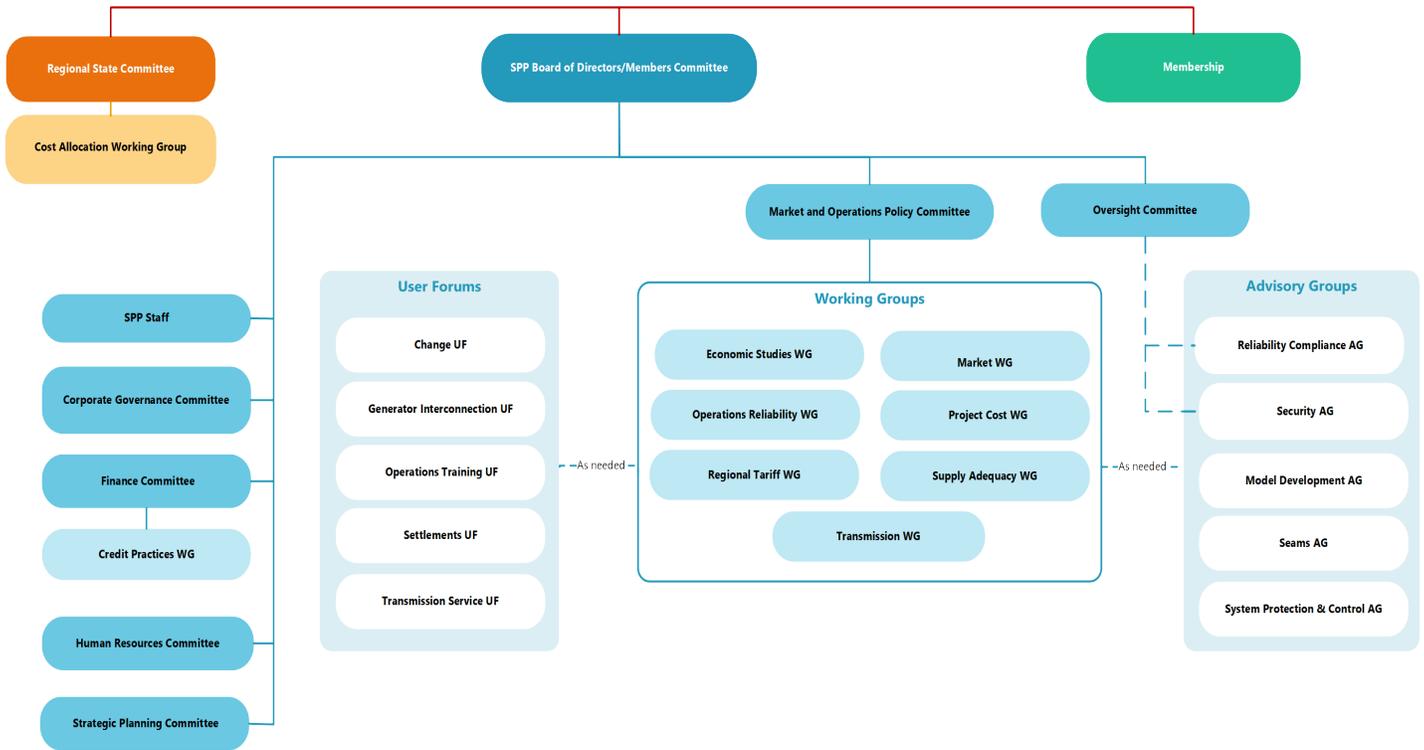
Together, this portfolio of projects and programs addresses stakeholder requests and regulatory directives.

PRIORITY	PROJECT	CATEGORY
1	Fast-Start Resource Logic	Previous
2	EMS, CMT & Markets Upgrade	Previous
3	FERC Order 2222	Unknown
4	HITT Program	Previous
5	West RTO	Unknown
6	HITT Uncertainty Product Development	Previous
7	ICCP Hardware & Software Upgrade	Previous
8	Freeze Date Replacement	Previous
9	Electric Storage & Hybrid Resources	New
10	Z2 FERC Remand Order	Unknown
11	PROM)D Upgrade	Previous

12	HITT M1 Improve Congestion Hedging	New
13	SCRIPT	New
14	Identity and Access Management (IAM) – User Lifecycle Management (ULM) Integration	New
15	Interface Pricing and Pseudo Tie Modeling	Previous
16	HITT Multi-Day Unit Commitment	New
17	Netezza Replacement	New
18	Data Loss Prevention	New
19	Data Aging and Archiving	New
20	ITSM Solution Phase 2 – Implementation	New
TBD	Winter Weather Event Improvements ¹	Unknown

¹ Winter weather event improvements was an effort added very late in the project review and budget process. It currently does not have a business case nor a budget pending regulatory direction but is included for transparency and consistency.

APPENDIX 1: SPP WORKING GROUPS



APPENDIX 2: SPP STAFF ORGANIZATION

