The Power of Relationships
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75 YEARS OF SOUTHWEST POWER POOL

Nathania Sawyer with Les Dillahunty
# Contents

Acknowledgements ................................................................. 9  
Foreword ................................................................................. 11  
Introduction: Illuminating History ........................................... 13  
  Early Utility Structure ........................................................... 13  
Chapter 1: It All Started with Aluminum (1941–1945) ................. 17  
  Preparing for Production ....................................................... 18  
  Pooling Resources ............................................................... 19  
  Getting Down to Business ..................................................... 21  
  Success! ................................................................................. 25  
Chapter 2: Postwar Growth and Declining Costs (1945–1970) ....... 29  
  Supply and Demand ............................................................. 31  
  Defense Power Administration ............................................. 33  
  Peacetime Power ................................................................. 34  
  Lights Out ............................................................................. 38  
  Reliability ............................................................................. 40  
  Regional Reliability Organization ........................................ 40  
  Clean Air and Endangered Species ...................................... 43  
  Shifting from Consumption to Conservation ......................... 44  
  National Energy Act of 1978. ............................................... 45
### Contents

#### Chapter 4: Centralized Markets and the Move to Formality (1990–1997)
- Three-Mile Island .................................................. 46
- Pool Power .......................................................... 48
- Computerization ................................................... 49
- The Long, Hot Summer ............................................. 51
- Least Cost Utility Planning ...................................... 52
- SPP Transitions ..................................................... 55

- SPP Turns 50 .......................................................... 59
- Regional Transmission Groups .................................. 59
- Southwest Power Pool, Inc. ....................................... 62
- Next Hour Energy Exchange ..................................... 64
- Transmission Rating Criteria and System Operator Certification ................................................. 65

#### Chapter 6: The Bumpy Road to RTO Status (1997–2004)
- Order 888 — Standards of Conduct ......................... 67
- Order 889 — Open Access Same-time Information System ......................................................... 68
- Staying Focused ....................................................... 69
- Independent System Operators ................................. 71
- Regional Security Coordination ............................... 72
- Tariff Talks ............................................................ 74
- A Very Scary Halloween .......................................... 76
- Regional Transmission Tariff ................................... 77
- Growth Spurt ........................................................ 79

#### Chapter 6: The Bumpy Road to RTO Status (1997–2004)
- MAPP Merger Attempt .......................................... 83
- FERC Order 2000 .................................................. 84
- ISO/RTO Filing No. 1 ............................................. 85
- MISO Merger Attempt No. 1 ................................. 86
- Board of Directors Reorganization ......................... 86
- RTO Filing No. 2 ................................................... 87
- Southeast or Midwest? .......................................... 89
- MISO Merger: Attempt No. 2 ............................... 89
- Regrouping .......................................................... 91
- RTO Filing No. 3: Third Time is the Charm .............. 93
When I began working on this book, I felt very much like the blind men describing the elephant — every part I touched seemed different from the others, and I struggled to understand how they all fit together.

Staying with the elephant theme, I applied the answer to the proverbial question, “how do you eat an elephant?” and approached the challenge one bite of information at a time — many, many, many bites.

I have enjoyed the benefit of a lot of work done by a lot of people long before I joined the project. First and foremost, I have to thank Les Dillahunty for all of the preliminary work he did to pull together information and document SPP’s history. My job would have been infinitely harder if I had not had the benefit of his knowledge and his organizational skills.

Les headed up the editorial board for the project and ensured I received valuable feedback from the members — Nick Brown, Dave Christiano, Jim Eckelberger, Trudy Harper, Mel Perkins and Mike Ross.

The SPP officers, directors and members whom I interviewed were generous with their time and gracious about explaining complex issues and technical aspects of the electric industry. The collective knowledge of this group is staggering, and every conversation made me want to learn more.

I especially want to thank the SPP staff members who have been so patient, helpful and supportive during this process, especially Ronda Walters, who knew where all the boxes
were buried from her work to create the SPP history walls; Danni Wilson, who exemplified SPP’s welcoming spirit every time she signed me in the building and tracked down people for me; David Avery, who first approached me about working on this project; and Derek Wingfield and Dustin Smith, who facilitated my every need — no matter how strange.

Happy anniversary! And, thank you all for giving me this opportunity to be a tiny part of the SPP story.

Nathania Sawyer
May 2016
It’s natural when undertaking an effort like this one — chronicling the entire, 75-year history of our company — to get sentimental for the “good old days”: years long-past that were simpler, easier and by extension better.

It’s true the early days of SPP were not as complex. As you read the following chapters you’ll see much of our company’s evolution has been in the direction of ever-increasing complexity, whether with regard to the electric grid we manage or the constantly shifting landscape of regulatory requirements and stakeholder interests we navigate.

By the same token, you could argue that it was much easier to do our work in decades past than it is today. It’s hard to believe these days — given the number of contracts, regulatory filings, and other legal documents we execute on a daily basis and the effort it takes to manage them all — that we operated for half a century with little more than handshakes among colleagues securing our role in a maturing industry.

Certainly there is much to miss about our early days, and no one could be blamed for a bit of nostalgia, but we must draw the line at thinking that makes our past any better than our present. For all the increased complexity and risk with which we’re now faced, we have to our credit today more experience, past success, lessons learned, tried and proven processes, advanced technology and trusted partners than ever before.

It is the last of those assets — our relationships — which we chose to make the centerpiece of this historical account, because without them none of the others would be possible.
SPP has long distinguished itself through our relationship-based approach to doing business. SPP exists because of our stakeholders. Period. Without their support — logistically, financially, politically, and often even emotionally — we would not be where we are today, if we were anywhere at all.

Many of our friends and colleagues, both present and past, are named in these pages for their contributions to our growth and maturation, and it is our pleasure to memorialize them here. Many other names are missing, though not because they were forgotten or unappreciated. There have simply been too many men and women with significant roles in our story to list them in print.

To all of you, though — whether featured in the following pages or not, a past or current employee of SPP, one of our many stakeholders, or just a reader with an interest in our company and its role in our nation’s critical infrastructure — know that your relationship to our company is valued, because SPP’s value depends on you.

Reliability is job one for SPP. We exist to help our members keep the lights on, today and in the future. We do so not through hard work, innovation, or efficiency, though each is a necessary component of our success. For SPP, reliability is accomplished through strong, healthy relationships with those we serve.

It is because of the strength of the relationships we have today that there is reason to be even more excited about our future than our present. So as you read these pages, we invite you to consider not only where we’ve come from but also where we’re going.

Here’s to getting started on the next 75 years.

Nick Brown
President and Chief Executive Officer

Jim Eckelberger
Chairman of the Board of Directors
Introduction: Illuminating History

Over time, the history of an organization that has been around for 75 years tends to get compressed and abridged. Origins become footnotes, and decisions that took years to make seem simple when presented in summary.

The simple version of the story goes like this: A group of companies came together to fill a wartime need, learned the advantages of pooling resources, and lived happily ever after. In reality, nothing about Southwest Power Pool’s history is simple. It covers decades of complicated issues, juggles competing national priorities and requires understanding complicated technical information.

Despite the complexities of the industry, the underlying theme of the organization’s history is simple and is expressed best in the current mission statement: “Helping our members work together to keep the lights on … today and in the future.”

This book barely scratches the surface of the history of the electric industry and all of the influences that have shaped it. But, viewing SPP in a broader context that considers the insights of members, directors and staff sheds some light on how this member-driven group formed and grew into the unique organization it is today.
EARLY UTILITY STRUCTURE

The electric utility industry developed from small suppliers who served customers using low-voltage lines during the latter part of the 19th century into monopolies controlled by a handful of holding companies by the mid-1930s. Technologies such as alternating current transformers and steam turbines allowed savvy entrepreneurs to take advantage of economies of scale as they bought and consolidated the smaller companies.

Progressive-Era reformers began to push for regulation of the growing industry at the state level, and by 1914, 43 states had policies in place to govern the electric utilities. States began to grant monopoly franchises with exclusive service territories while requiring the companies to provide service at regulated prices.

By the 1920s, holding companies — businesses that bought partial or total interest in the utilities — owned most of the electric companies. Large holding companies began buying up other, smaller ones, and the resulting, pyramid-shaped systems — in some cases upwards of 10 layers deep — passed each layer’s increasing costs and fees on to end-use customers.

By 1929, 16 groups controlled more than 90 percent of the nation’s output. Reports of widespread abuses including stock manipulation, excessive financial charges, distorted earnings reports and exorbitant fees made the holding companies targets for reform-minded politicians.

During his presidential campaign in 1932, Franklin Roosevelt demanded transparency from the public utilities and called for the holding companies to be regulated by the Federal Power Commission, which had been established in 1920 to regulate hydropower.

New Deal experiments with government-owned utilities such as the Tennessee Valley Authority and Bonneville Power Authority became the yardsticks for rate-setting, and the government sought to close the gap by controlling the holding companies. After several large holding-company systems had collapsed, the Federal Trade Commission investigated the situation. That investigation led to the passage of the Public Utility Holding Company Act of 1935, which required holding companies to register and report financial information.

“[When Edison, the father of the American Nation, the greatest living benefactor of mankind, snatched up the spark of Prometheus in his little pear-shaped bulb, it meant that fire had been discovered for the second time, that mankind had been delivered again from the curse of night.]”

— Emil Ludwig
Act of 1935 (PUHCA). PUHCA gave the Federal Power Commission authority to regulate wholesale rates for electric power transmitted between states, and it gave the Securities and Exchange Commission responsibility for regulating the holding companies.

As a result of PUHCA, many utility companies declined to participate in interstate operations to avoid federal regulation. The issues of public versus private ownership and federal versus state regulation intensified toward the end of the Great Depression — until the beginnings of World War II shifted the nation’s focus and forced a truce between the competing interests.

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This 1926 map shows the early interconnections of the electric utility industry.
“Pouring of aluminum at Reynolds Metal Plant at Arkadelphia, Clark County, Arkansas (Jones Mill).” Item 1247, from the Collections of the Arkansas State Archives
In his 1940 address to Congress, President Franklin Roosevelt said, “These are ominous days — days whose swift and shocking developments force every neutral nation to look to its defenses in the light of new factors: The brutal force of modern offensive war has been loosed in all its horror. New powers of destruction, incredibly swift and deadly, have been developed; and those who wield them are ruthless and daring. No old defense is so strong that it requires no further strengthening, and no attack is so unlikely or impossible that it may be ignored.”

President Roosevelt monitored the developments in Europe for some time while quietly assessing America’s resources for wartime production. In August 1938, the Associated Press reported: “President Roosevelt gave attention today to the problem of safeguarding the life-line of the nation’s industry — electric power — in time of war. He conferred with Assistant Secretary of War Louis Johnson and Basil Manly, member of the Federal Power Commission, whom the President had designated previously to make a survey of the power situation in the whole eastern industrial area.”

In January 1941, President Roosevelt issued Executive Order 8629, creating the Office of Production Management and the Office for Emergency Management. The order charged the new organizations “to increase, accelerate and regulate the production and supply of
materials, articles and equipment and the provision of emergency plant facilities and services required for the national defense.” Ultimately, this order encompassed everything from raw materials to electricity and other utilities necessary to run the plants.

**PREPARING FOR PRODUCTION**

President Roosevelt knew airplane production would be critical to any war effort, so he set a production goal of 50,000 airplanes per year, which meant expanding the production of aluminum, the primary metal used in aircraft.

At the time, the only U.S. producer of primary aluminum was the Aluminum Company of America (Alcoa), which operated four reduction plants located in Tennessee, North Carolina and New York with a total annual capacity of 300 million pounds. Preliminary military estimates indicated a need for 513 million pounds of aluminum per year, but that number quickly increased to 1.64 billion pounds.

When Arkansas Governor Carl Bailey read the list of raw resources and industries essential to national defense in the Industrial Mobilization Plan created by the Army and Navy Munitions Board, he saw the potential for bringing defense industries to Arkansas. Bailey quickly formed the Arkansas Industrial Committee to gather information on the state’s resources and to find ways to bring those resources to the attention of the federal government. The Arkansas Gazette reported in August 1940 that Arkansas was the first state in the nation to form such a committee.

In the end, the state’s efforts paid off. Multiple defense projects came to Arkansas. Donald Nelson, chairman of the War Production Board, negotiated a deal with Alcoa that included the government’s construction of four new aluminum plants, including one in Arkansas, to be leased to Alcoa.

Getting enough raw bauxite to meet demand presented no problem. Approximately 90 percent of the nation’s deposits of bauxite ore were located at Bauxite, Arkansas, where Alcoa (previously known as the Pittsburgh Reduction Company) had maintained a small ore-drying plant since 1903.

Getting enough electricity was another matter. Making aluminum from bauxite requires massive amounts of electricity — approximately 10 to 12 kilowatts of power per pound of aluminum for the production process as well as power to light the plants and run the ma-
chinery. First, the bauxite ore must be refined into a fine, white powder called alumina or aluminum oxide. Then the alumina is “zapped” with a continuous electric current that separates the aluminum from the oxygen and melts the aluminum. Next, small amounts of other metals are mixed with the molten aluminum to add strength and corrosion resistance, and the molten metal is cast into ingots or blocks.

Arkansas Governor Homer Adkins, who succeeded Bailey, worked to build up the state’s power sources in anticipation of getting defense industries to the state. Clyde Ellis, a United States Congressman and powerful advocate for rural electrification in Arkansas who later served as a combat officer and Lieutenant in the United States Navy during World War II, had been told by both government and industry representatives that the rates charged by the state’s private utilities were too high to attract industry — especially when compared with the rates charged by government utilities such as the Tennessee Valley Authority. So, Ellis pushed for projects that would increase the state’s generating capacity and furnish adequate power at competitive prices, saying, “Let us first get the power, then we can get the industries.” Ellis would go on to serve as the first CEO of the National Rural Electric Cooperatives Association in Washington, DC.

The Defense Plant Corporation chose to build the new plant in the small community of Jones Mill, near Malvern, Arkansas. The location was strategic for two reasons: Arkansas Power and Light Company (AP&L), the state’s primary electric utility, had built the state’s first major hydroelectric facility there, and raw materials could be transported easily from Alcoa’s mining operations in Bauxite located only 30 miles away.

The government also planned to build a steam power plant as part of the $33 million project, but everything changed on December 7, 1941, when the Japanese attack on Pearl Harbor pushed the United States into World War II.

POOLING RESOURCES

Congress declared war on Japan on December 8, 1941, and on Germany on December 11, 1941 — just hours after Germany declared war on the United States. Suddenly, the nation turned from planning for possible defense needs to being actively involved in World War II. Plans to build a generating station for the new aluminum plant in Arkansas had to be shelved and a new solution found so the plant could go into production as soon as possible.
The government had explored ways to ensure wartime power needs for some time, so the idea of pooling power was not a new one. The Federal Power Commission reported in 1940: “The Commission, in cooperation with a special committee representing the utility systems, has continued the investigation of the technical and economic feasibility of a series of high-capacity transmission interconnections between the important centers of defense production. Such interconnections, if found feasible, would not only increase available capacity by reducing the total reserve requirements but would also serve as a protection to each interconnected area against interruption of industrial production resulting from the destruction of a major generating station by hostile act.”

The government had gained some practical experience during the fall of 1941 after a severe drought in the Tennessee Valley caused a loss of water power that threatened to shut down aluminum plants serviced by the Tennessee Valley Authority. The Office of War Utilities pooled the resources of 27 public and private systems to provide the needed power and surpluses until the emergency ended.

Powering the new aluminum plant in Arkansas would require at least 120 megawatts of power, but the entire state of Arkansas had a total capacity of only 100 megawatts. To meet the demand for power, 11 regional utilities agreed to provide power for the new aluminum plant and signed an Intercompany Agreement on December 16, 1941, officially forming the Southwest Power Pool (SPP), just eight days after Congress declared war on Japan.

The original 11 members of SPP were:
- Arkansas Power and Light Company
- The Empire District Electric Company
- Kansas Gas and Electric Company
- Louisiana Power and Light Company
- Mississippi Power and Light Company
- Nebraska Power Company
- Oklahoma Gas and Electric Company
- Public Service Company of Oklahoma
- Southwestern Gas and Electric Company
- Southwestern Light and Power
- Texas Power and Light Company
Some interconnections already existed because the utilities participated in many existing, smaller pools. The companies in Arkansas, Louisiana and Mississippi had operated for many years as a unit and were tied to the Tennessee Valley Authority on the east, Gulf States Utilities on the south and Southwestern Gas and Electric on the west.

The systems in Oklahoma operated in parallel with Kansas Gas and Electric, which was operating with Nebraska Power Company through a 275-mile, 154-kilovolt (kV) line from Midian, Kansas, to South Omaha, Nebraska.

The Oklahoma companies were also tied to Southwestern Gas and Electric Company by a 138-kV line from Weleetka, Oklahoma, to Ashdown, Arkansas.

The members established the fundamental parameters within which their engineers would build a plan:

- To make full use of all existing interconnections,
- To construct additional interconnecting lines of capacity adequate for interchanging the reserve and diversity capacity between the group areas,
- To plan and route the new lines to use the minimum amount of critical materials and at the same time to have them located for maximum permanent usefulness,
- To apply a carefully planned system of automatic tie-line load control equipment to realize the maximum capacities of the interconnections.

The companies estimated they could make an additional 200 megawatts of power available from existing sources by building additional transmission lines to connect the various systems.

**GETTING DOWN TO BUSINESS**

In 1940, Secretary of War Henry Stimson said, “If you are going to try to go to war — or to prepare for war — in a capitalist country, you have got to let business make money out of the process or business won’t work.”
Balancing patriotism and profit meant the power pool functioned as a member-driven organization. Each company provided representatives for the committees, and these groups worked together to address the needs and concerns related to the power pool. Each company continued to operate as an independent business serving its existing customers while generating additional resources for the Jones Mill aluminum plant. The operation of the pool was superimposed upon the companies’ normal operations.

Cecil Lynch of Arkansas Power and Light presided as chairman of the governing committee when the members met for the first time on December 30, 1941. One of the fundamental components the group wanted the pool to have was an operating organization of “cooperative, competent men who have full knowledge of the territory, to operate the pool at the maximum capacity for carrying the war loads.”

During that meeting, the group discussed a list of candidates for the consulting staff, narrowed the pool and authorized Lynch to interview the finalists. Ultimately, Lynch selected:

- Ed C. Curtis from Ebasco Services, Inc., coordinating engineer — to oversee the work of the other engineers and work with the governing committee
- E.E. George from Tennessee Electric Power Company, electrical engineer — to calculate incremental transmission losses, determine the electrical behavior and transmission capacity limitations of the systems and interconnections and advise on problems of frequency and load control, dispatching and communications
- D. G. Iliff from Ebasco Services, Inc., mechanical engineer — to determine energy production costs from the available sources and schedule production for maximum economy within transmission and service limitations
- Charles Custer from the Arkansas Utilities Commission, accounting engineer — to work out proper forms, operating logs, procedures for recording and interchanging data; prepare reports, and assist with the distribution of the revenues from the pool operation among the various participants.
The committee decided to locate the headquarters for the consulting staff at the Woodward Substation of AP&L, located near Pine Bluff, Arkansas. That location served as the dispatching headquarters and terminal of communication lines for AP&L.

The group also authorized a calculating board study and selected R. E. Pierce with Ebasco Services to coordinate assembling the data and arranging for the study using the network analyzer at the General Electric Company at Schenectady, New York.

SPP staff collected and distributed data, made analyses and reports on coordinated operation matters and acted as consultants to the committees and pool members.

Coordinating efforts meant the various system operators had to work together to keep power flowing to the aluminum plant. Jim McNabb of Associated Electric Cooperatives remembered L. E. Huff, one of the first operators from the Public Service Company of Oklahoma (PSO).

“Huff was a system operator of PSO, and system operators in those days were a unique breed, one and all,” McNabb said. “Huff, during the war, lived in a room adjacent to the PSO control center, and he was there 24/7. Each system had these kinds of people.”

In 1965, S. B. Morehouse of the Leeds and Northrup Company in Pennsylvania described the technological challenges of connecting different systems: “Eighteen new control centers were set up for power systems in an eight-state area, which went from isolated op-
eration to interconnected operation, with telemetering and full automatic control in one step. The growing pains were terrific, and this was where I fought the war.”

SPP formed exactly one month before President Roosevelt signed Executive Order 9024, establishing the War Production Board (WPB) and gave the board authority to perform three basic functions:

- To direct conversion of industries from peacetime work to meet wartime needs
- To establish priorities in the distribution of materials and services
- To prohibit nonessential production

Resources were so tight during construction of the Jones Mill plant that they used silver borrowed from the U.S. Treasury Department as the main busbar between the power supply and the pot (production) lines instead of copper or aluminum. Immediately after the war, they removed this silver busbar and returned the precious metal to the Treasury Department.

WPB restrictions curtailed new generation construction to expand capacity despite the ever-increasing need created by wartime production. That meant SPP had to make the most of its existing resources despite the growing demand for electricity.

In his final report, WPB Chairman J. A. Krug noted that demand for electric power jumped from 161.3 billion kilowatt hours in 1939 to 279.5 billion kilowatt hours in 1944 — an increase of 73 percent. During the same period, the government allowed the generating capacity of the nation’s power plants to increase only 26 percent — from 49.4 million to 62 million kilowatts.

SPP had to expand transmission lines to create the interconnections it needed. The leadership estimated that members would spend $4,939,000 in “perfecting the pool with a total installed capacity of 1.5 million kilowatts.”

One of these projects, funded by Kansas Gas and Electric Company and Nebraska Power Company, built a 154,000-volt transmission line between El Dorado, Kansas, and Omaha, Nebraska.

According to an article in the Emporia Daily Gazette on April 2, 1942, “A point of interest in the construction of the line is the part played by the airplane. By using an airplane to make the preliminary survey of the line, several weeks’ time was saved, and the best possible route was selected. Aerial photos of the route were a great aid in obtaining right-of-
way and in actually locating the line.” Building this line required approximately 1,156 tons of copper, 377 tons of steel, 3,365 poles, 51,000 insulators and 2,260 acres of right-of-way.

In April 1942, the technical staff moved from its temporary space at the AP&L building into suite 727 of the Pyramid Building in Little Rock, setting up the first office dedicated to SPP.

SUCCESS!

Speaking in May 1942, Cecil Lynch said of the men working on the project, “They know it is a big job, and they like big jobs. And, we all know that we must not and cannot fail.”

In August 1942, the Jones Mill crew produced the first ingot of aluminum ever manufactured in Arkansas. The De Witt Era-Enterprise ran a large article with the headline “American Bombers from Arkansas Aluminum: Southwest Power Pool Congregates Electricity from Six States to Transform Native Bauxite into Precious Metal for Airplanes.” The reporter praised the efforts of the pool by saying, “Although this meant the immediate expenditure of nearly five million dollars of their own funds, the companies agreed without hesitation to make this contribution to the war effort. They realized it meant taking a tremendous business risk — that they might never get back all of the money they were investing. But they also realized that to win this war all forces and all agencies must exert themselves to the limit, and they knew they would be making a lasting contribution to Victory.”

SPP formed specifically to provide power for the Arkansas aluminum plant, but its member companies addressed many other needs during the war. The War Production Board called a meeting of SPP members plus the Texas systems in August 1943 to discuss those
“With acts of God happening right and left, we had to work fast and scrape the bottom of the barrel to keep Catherine in operation,” said J. Robert Welsh, power pool engineer of Southwestern Gas and Electric at Shreveport.

“If that power had ever failed, the processing pots at the vital plant would have frozen up, and it would have taken better than two months to put them back in operation.”

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**POWER POOL KEPT BUSY IN STORM**

By James Downing

United Press Staff Writer

LITTLE ROCK, Ark., May 13 [1943] — The story was revealed today of how the Southwest Power Pool “scraped the bottom of the barrel” last night to keep the giant Lake Catherine aluminum plant in operation after floods and tornadoes had wiped out more than half the normal power sources in Oklahoma and Texas.

The aluminum plant, which requires as much electric power as all of Arkansas combined, went through the night without a bobble, as power was shot into the pool’s spiderweb of lines from as far away as Nebraska, Kansas, Tennessee and Alabama.

**Tornado Wrecks Line**

A tornado in east Texas wrecked a line between Marshall and Overton and another line between Kilgore and Overton after Public Service Company of Oklahoma generating plants at Tulsa and Muskogee were interrupted by floodwaters, and the big Weleetka plant of that company was threatened by floodwaters.

At Disney, the big Grand River Dam kept up its full output into the Arkansas–Louisiana cooperative line to Lake Catherine, bolstered by borrowed power from other Kansas and Oklahoma stations.

“With acts of God happening right and left, we had to work fast and scrape the bottom of the barrel to keep Catherine in operation,” said J. Robert Welsh, power pool engineer of Southwestern Gas and Electric at Shreveport.

“If that power had ever failed, the processing pots at the vital plant would have frozen up, and it would have taken better than two months to put them back in operation.

“But the important thing was that we kept the aluminum plant in operation. It was a busy night for all concerned,” he concluded.

Virtually every generating plant in western Arkansas was called on to handle part of the load. TVA power was pulled in from Memphis. The Kansas Gas and Electric Company pulled 10,000 kilowatts into the Oklahoma Gas and Electric company lines at Arkansas City. Public Service Company of Oklahoma generators at Tulsa and Weleetka were returned to near-normal operations by use of pumps and conversion to oil heat.

Every power line running into Arkansas was hot with overloads.
needs. The group thought by maximizing purchases and operating on razor-thin reserves, all loads could be carried.

They formed two committees — an executive committee to determine policies and an operating committee that would compile reports, work out details and carry out operating plans. This voluntary organization was called the Interconnected Power Systems-Southwest Area (IPS).

The work of SPP and IPS overlapped in several key areas. Early records indicated the two groups met separately (although, often in back-to-back meetings at the same location) but that both groups focused on load, capacity and reserves.

SPP was ahead of the curve when the government adopted Limitation Order L-94 in September 1943, which “require[d] electric utilities to operate their reservoirs, generating plants, transmission lines and other facilities and to interchange electric power with other utilities so as to provide maximum coordination of power supply for war production and essential civilian uses.”

At the July 1944 meeting of the IPS, Cecil Lynch noted he had been serving as the chairman for both IPS and SPP. He asked the group to select another person as chair of the IPS so he could focus more on his responsibilities as the chair of SPP.

At some point, IPS decided to have both a volunteer chairman chosen from the membership as well as a staff executive director. Charles Custer became SPP’s first executive director.

SPP members kept the power flowing without interruption to the aluminum plant for the duration of the war. At its peak annual production level, the plant produced 156 million pounds of aluminum.
The Power of Relationships
On September 2, 1945, World War II ended with the official surrender of Japan to the Allied forces. Across the nation, defense manufacturers looked for ways to resume peacetime production and replace old equipment or expand production capability, which hadn’t been possible during wartime rationing.

In his final report to the president, titled *Wartime Production Achievements and the Reconversion Outlook*, the chairman of the War Production Board stated, “[Power engineers] point out that power companies, relieved of their tremendous war burden, are planning to spend $1.5 billion in the next 18 months for construction and equipment which is needed to carry the reduced peacetime load.”

During the war, SPP staff gained considerable technical expertise that benefited the IPS members, and the members worried about losing this resource when the SPP contract for the aluminum plant expired.

At the November 2, 1944, executive committee meeting, the group unanimously agreed continued interconnected operation was desirable and that they would need to continue to maintain a central office for collection, compilation and distribution of statistical data. The group asked the chairman to appoint a subcommittee to prepare a plan for continuing the central office and retaining the coordinator, clerical and statistical staff and the technical staff.
In January 1945, the Interconnected Systems Group — one of the earliest national organizations formed to promote interconnections — gave IPS formal recognition. IPS changed its name to the Southwest Regional Committee (later known as the Southwest Regional Group).

An unidentified speaker at a Southwest Regional Group meeting said, “The pool office, plus members of the pool, realized through many years of past experiences that the art of interconnected operation is a progressive art, new ideas and new problems are everyday occurrences, and also that the more problems which could be aired and solved and the more new ideas that could be tested and used, the more improvements could be expected and achieved in interconnected operation.”

On October 23, 1946, 12 organizations signed an intercompany agreement titled “Agreement to Continue the Study of Coordination of Power and Transmission Facilities of the Southwest Area” to establish the Southwest Power Staff (although the group continued to refer to itself as the Southwest Power Pool). The participating organizations were:

- Arkansas-Missouri Power Corporation
- Arkansas Power and Light Company
- Kansas Gas and Electric Company
- The Empire District Electric Company
- Gulf States Utilities Company
- Louisiana Power and Light Company
- Mississippi Power and Light Company
- Missouri Utilities Company
- Oklahoma Gas and Electric Company
- Oklahoma Power and Water Company
- Public Service Company of Oklahoma
- Southwestern Gas and Electric Company

INTERCONNECTED IN MORE WAYS THAN ONE

In October 1952, SPP’s first Executive Director Charles Custer presented a paper to the Edison Electrical Institute describing Southwest Power Pool and associated systems.

“There are three separate and distinct organizations whose functions and operations are so closely knit together that it is difficult to identify one from the other unless you are intimately associated with the activities of the systems of the area,” Custer said.

He outlined the three organizations thusly:

Southwest Power Pool — formed in 1941, maintains a technical staff with offices in Little Rock, Ark.

Southwest Power Systems — set up in 1951, includes the systems of the SPP plus the balance of electric companies in the southwest area that are or will eventually be operating interconnected.

Interconnected Power Systems—Southwest Area — includes members of all the power systems west of the Mississippi River operating interconnected and in parallel with systems east of the Mississippi, includes both public and private power.
The companies agreed to pay for the organization based on proportions calculated using the gross operating revenue of the electricity portion of each company. During the next few years, five more companies joined SPP.

**SUPPLY AND DEMAND**

The war had slowed down Rural Electrification Administration (REA) programs to bring electricity to farmers and others living outside the cities, but that work continued throughout the 1940s. People who had moved from rural communities to more urban areas to work in defense industries saw the advantages of electricity and no longer viewed it as a mysterious luxury. Electricity was now an important part of everyday life.

Wartime needs had expanded the infrastructure for electric power, and post-war expansion led to a viscous cycle that fueled consumption — building larger generating units invoked economies of scale, which drove down cost, which increased demand, which led to creating more power sources.

The growing demand for electricity sparked concerns that unprecedented use would overtax the systems.

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**AIR CONDITIONING**

In 1851, John Gorrie of Florida received a patent for an ice-making machine that used a compressor that could be powered by horse, water, wind–driven sails or steam — marking the birth of mechanical refrigeration. During the next 100 years, air conditioning developed into a commercial product and moved from being a luxury item for the wealthy in the 1930s to being an everyday household item during the post–World War II economic boom in the 1950s. Here’s a brief look at the development of the air conditioner.

1902: While working for the Buffalo Forge Company in 1902, Willis Carrier was tasked with solving a humidity problem that was causing magazine pages to wrinkle at Sackett–Wilhelms Lithographing and Publishing Company in Brooklyn. He designed the first modern air–cooling unit to solve the problem.

1904: The St. Louis World’s Fair organizers used mechanical refrigeration to cool the Missouri State Building, marking the first time the American public was exposed to the concept of comfort cooling.

1929: Building off refrigeration technology, Frigidaire introduced a new split–system room cooler to the marketplace in 1929. Frank Faust with General Electric improved on this design and developed a self–contained room cooler. The company produced 32 similar prototypes from 1930 to 1931.

1931: Inventors H. H. Schultz and J. Q. Sherman filed a patent for an air-conditioning unit that could be placed on a window ledge. The units hit the market in 1932 but were not widely purchased due to high cost.

1942: The first summer peaking power plant was built — in part to accommodate the demand for power for industrial and commercial air conditioning.

1947: Engineer Henry Galson developed compact, inexpensive window air conditioners and set up production lines for several manufacturers. By 1947, 43,000 of these types of units sold in the U.S.

Sources: [http://energy.gov/articles/history-air-conditioning](http://energy.gov/articles/history-air-conditioning) and Retooling the U.S. Housing Industry: How It Got Here, Why It’s Broken, How to Fix It.
During the fall of 1947, the concern was so great that the Associated Press sent a team of journalists to do a section-by-section power survey of the nation. They reported in October that shortages “already plagued western Pennsylvania, northern California, central Arizona and parts of Florida.”

Hamilton Moses of AP&L told journalists SPP planned to hike its generating capacity by nearly 75 percent (from 1,756,000 to more than 3,078,000 kilowatts per hour) by 1951 with an estimated cost of equipment alone of $185 million (excluding transmission equipment).

SPP Executive Director Charles Custer emphasized the speed of SPP’s growth when he told reporters, “In the past, it took from 12 to 14 years for an electric system to double its generating capacity.”

Despite optimistic predictions, SPP suffered shortages during the summer of 1948. Kansas Gas and Electric Company (KG&E) reported that SPP shortages had extended into southeast Kansas and asked its customers to cut down on “comfort service” — air conditioning, sign and window lighting, etc., — for six to eight weeks.

Sam Brolund, division manager of KG&E, said, “… the shortage has been brought about through doubled peak load since 1940.” He added that drought and low water conditions in hydroelectric areas in Nebraska, Missouri and Arkansas — as well as damage at the Riverton, Kansas, plant of the Empire District Electric Company of Joplin, Missouri — meant KG&E was unable to draw on neighboring systems in the pool to tide it over.

The shortage situation in 1948 would have been more difficult to manage if SPP hadn’t invested in an upgraded communication system. During their early days, the pool depended primarily on carrier communication (information sent over the same lines that carried the power but sent at a high frequency).

Custer said this type of communication was adequate when the distance between systems was relatively small. As the system grew and signals had to be sent over longer distances, however, it became less reliable, and dispatchers complained SPP was “trying to get too many miles per watt.” SPP leased a telephone circuit from AT&T that connected the
dispatchers’ offices at the pool’s principal control centers. Members of the operating committee had extensions in their offices, but Custer said: “the dispatcher has the right-of-way at all times.”

**DEFENSE POWER ADMINISTRATION**

Although the United States was enjoying the post-war boom, the lingering threat of further hostilities remained. Between Cold War politics and the Korean War (1950-1953), America was obsessed with nuclear weapons and communism.

For the electric utility industry, this meant intense scrutiny. The government sought to protect the power supply from all threats — both foreign and domestic — and so formed the Defense Power Administration (DPA) within the Department of the Interior on December 4, 1950, as part of the Defense Production Act of 1950.

In 1950, the U.S. electric power industry consisted of approximately 4,000 individual suppliers, including:

- 1,000 owned by stockholders
- 2,000 owned by municipalities and power districts
- 1,000 owned by federal government, state government or consumer-cooperatives

The DPA hoped to achieve its defense goals through cooperation with minimum compulsory action. At the first meeting of the Electric Utility Defense Advisory Council, held October 19, 1950, the Secretary of the Interior said, “In return for your

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### A FISHY STORY, BUT TRUE:
**OHIO POWER FAILURE IS FELT BY ARKANSAS ANGLER**

OKLAHOMA CITY, Jan. 31 [1951] (AP) — A power plant failed at Dayton, Ohio, and an Arkansas fisherman was almost knocked out of his boat.

Sounds fishy, but the story was told to newsmen by a group of engineers to explain the technical workings of the Southwest Power Pool.

The engineers gathered today to iron out problems related to interconnecting utility systems in the central part of the country — principally the southwest.

The Southwest Power Pool was inaugurated in World War II. Arkansas needed a lot of power for industry.

When companies in Oklahoma, Arkansas, Louisiana and Texas tossed in their surpluses, it added up to a tremendous total of power available for emergencies.

‘Interconnection’ simply means one company stands ready to give a boost to a neighbor. Government and private power sources are combined, yet every firm runs its own business.

But how did that fisherman almost get knocked out of his boat?

It was this way. The Tennessee Valley Authority was pulling power from the plant at Dayton. The plant had a failure. Automatically, TVA began to receive its power from an Arkansas plant.

Flood gates at Carpenter Dam on Lake Hamilton at Hot Springs, Ark., opened and water gushed through turbines there. The fisherman below the dam was bounced around quite gingerly by the extra water.
cooperation and support, I give you my solemn word that ... I shall take no action with the
intention of giving any one segment of the electric power industry an advantage over any
other. I shall not use the defense powers entrusted to me as a means of advancing public
power development at the expense of private power development. Nor shall I permit private
power interests to dominate public power."

DPA made use of the existing regional power pools and promoted new interconnected
transmission lines within or between regions to amplify the capabilities of various areas. It
also encouraged coordinated maintenance programs through which reserve margins could
be strengthened and equalized.

Not all enemies lurked outside the U.S. borders. In August 1950, prosecutors convened
a grand jury to hear the case of Ethel and Julius Rosenberg, an American couple who com-
mitted atomic espionage for the Soviet Union. This act ignited existing fears about potential
anti-American activities and increased the demand for national security, including protec-
tion of the country’s power supply.

In a summary of the December 12, 1950, operating committee meeting, Cecil Lynch
wrote, “I am sure most of you know that certain members of this group have been closely
checked by loyalty investigators and are subject to heavy penalties for disclosure of certain
information entrusted to them.”

The agenda for the December 1950 SPP Operating Committee meeting included re-
ports on the activities of the Defense Power Administration, National Security Resources
Board and the National Production Authority. SPP Executive Director Charles Custer also
reported, to the extent allowed, on various Congressional committee hearings he had mon-
tored on behalf of the SPP members. Cecil Lynch told the group, “He [Custer] is intensely
loyal to these companies, to his country and to the American way of life. He is in a difficult
position in that he is bound under threat of severe legal penalties to withhold from you cer-
tain of his operations, which must for the time remain obscure.”

**PEACETIME POWER**

Across the country, expanded electric service allowed more people to enjoy the comfort
and convenience offered by electric appliances. Everything from kitchen appliances to per-
sonal grooming items ran on electricity. Television sales increased dramatically during this
period — from 0.4 percent growth in 1948 to 55.7 percent in 1954 and 83.2 percent in 1958. And, consumers bought more than 1 million air-conditioning units in 1953 alone.

Behind the scenes, President Dwight Eisenhower was working to ease concerns about “the fearful atomic dilemma” by encouraging ways to transform the atom “from a scourge into a benefit for mankind.”

When President Eisenhower gave his “Atoms for Peace” speech to the United Nations General Assembly on December 8, 1953, he said, “The more important responsibility of this atomic energy agency would be to devise methods whereby this fissionable material would be allocated to serve the peaceful pursuits of mankind. Experts would be mobilized to apply atomic energy to the needs of agriculture, medicine and other peaceful activities. A special purpose would be to provide abundant electrical energy in the power-starved areas of the world.”

On September 16, 1954, Lewis Strauss, chairman of the U.S. Atomic Energy Commission, spoke to the National Association of Science Writers in New York City about how scientific research would lead to better lives for future generations.

“It is not too much to expect that our children will enjoy in their homes electrical energy too cheap to meter; will know of great periodic regional famines in the world only as matters of history; will travel effortlessly over the seas and under them and through the air with a minimum of danger and at great speeds, and will experience a lifespan far longer than ours, as disease yields and man comes to understand what causes him to age,” Strauss said. “This is the forecast of an age of peace.”

Although not speaking specifically about nuclear energy, Strauss’ remarks foreshadowed the move to build nuclear generating plants and tap into the potential of atomic energy. In July 1957, SPP member companies formed the Southwest Atomic Energy Associates, a nonprofit consortium, to explore nuclear power’s potential. D. C. McKee, then-president of Empire District Electric Company, announced, “This corporation is undertaking a research and development program aimed at practical use of atomic energy as a supplemental fuel for the future electrical needs of the areas.” According to McKee, the consortium’s objectives were to:

Removing the stigma associated with nuclear explosives became a national initiative.
Contribute to advancement of the technology of atomic power reactors or furnaces
Look toward ultimate construction and operation of one or more large atomic power plants with electrical capacity of between 200,000 and 400,000 kilowatts each.

The structure of SPP remained largely the same during this period; the group formed committees and subcommittees to address various shared issues, and the SPP office facilitated the meetings and kept the records for the various groups. The SPP staff was also responsible for these functions:

- Headquarters for the Southwest Atomic Energy Associates
- Area representative for Edison Electric Institute electric power survey
- Coordinator for Southwest Region of interconnected Systems Committee
- Area coordinator for Civilian Defense activities
- Regional liaison with other Federal agencies
- Clearinghouse for intentional interchange energy for the Southwest and Northwest regions (including all of the main interconnected systems west of the Mississippi River and east of Fort Peck, Montana)
- Coordinator of power-plant overhaul schedules in Southwest regions
- Statistical office for reports on needed and actual reserve capacity in the Southwest area

Some of the functions of SPP were covered by contracts between the systems, and others were entirely informal.

“You would not believe the camaraderie back in those days,” said Ron Hardage from the Public Service Company of Oklahoma (PSO), “We went to meetings … and we got a little ornery with each other and told it like it was. You’d think people would walk away mad, but as soon as the meeting was over, we all got up and went to dinner together and had a good time. … Even though you were competitors, you still were operating one system and trying to all do the same job. … We all had to make money for our individual companies; we always tried to put that on top, but our real job was to operate a smooth interconnection.”

In 1961, several SPP member companies completed an agreement with Tennessee Valley Authority (TVA) to provide off-peak power exchanges. TVA had a surplus of power during the summer months when SPP members needed it the most, and SPP members could provide extra power to TVA during the winter to help with the TVA’s peak season.
“The Southwest Power Pool was a pretty broad organization as far as membership,” former SPP President John Marschewski explained. “What they ended up doing was creating another organization made up only of private, investor-owned utilities that was called the South Central Electric Companies — or SCEC.”

A task force determined SCEC would need a digital computer, ten 35ASR teletypes and use of the full period leased telephone circuit that had been installed by SPP in the 1940s. After determining the equipment needs, the group considered space requirements. SCEC operated as a separate organization with Pat Jones from Central Power and Light Company in Texas as coordinator for the power exchange operation. Jones worked out of the SPP offices in the Pyramid Building until the group decided the two organizations should find new offices with adjoining space that would allow for shared economies while separating the two entities. SPP and SCEC moved into new offices in the Mart Building in April 1965.

Although the deal was between TVA and SCEC, SPP provided accounting services for the transactions, performed transmission studies and analyzed the effects of the interchange — services that helped the interchange run smoothly and cost effectively.

“This transaction was huge, and it was the basis for the construction of what are today the bones of the interregional transmission system,” SPP Director of Transmission Policy Pat Bourne said.
To facilitate the transmission exchange, SCEC built the first 500-kV network in the U.S. with 345-kV extensions to facilitate the 1,500-megawatt seasonal diversity exchange.

**LIGHTS OUT**

By the mid-1960s, demand for electricity had grown by 7-10 percent a year, and the power companies scrambled to meet the demand. Many areas of the country frequently experienced drops in voltage — what would come to be known as “brownouts” — during periods of high demand.

The companies created more and more interconnections to help maintain service while they constructed new generators.

On November 9, 1965, a single transmission line from a generation station in Niagara, Ontario, tripped, starting a massive blackout in the northeastern United States and southeastern Canada. According to an article in *Transmission and Distribution World*:

- Within 2.5 seconds, four other transmission lines became overloaded and tripped, isolating 1,800 MW of generation at the Niagara Falls station.
- After their isolation, the generators became unstable and tripped off-line.
- The northeast power system became unstable and separated into isolated power systems within four seconds.
- Outage and islanding occurred throughout New York, Ontario, most of New England and small parts of New Jersey and Pennsylvania.
- Most islands went black within in five minutes, due to imbalances between generation and load.

The cascading blackouts resulted in 30 million people in an 80,000-square-mile area going without electricity for up to 13 hours.

America was still under the influence of Cold War politics, and many people feared the United States was under attack. One pilot flying over a completely dark New York City said, “I thought, ‘another Pearl Harbor!’”

Dave Christiano, a trustee with the SPP Regional Entity, was living in New York state at the time of the blackout.

“I remember exactly where I was and what I was doing,” Christiano said. “We [he and his electrician father] were in the kitchen playing cards when the lights went out. People...”
thought ‘gee, maybe the Russians did this’ — what other explanation could there be?”

Ron Hardage, who worked as an operator at Public Service Company of Oklahoma at the time, remembered: “I happened to be on [my shift] that night when that happened. I saw the frequency take off south. We knew there was a problem, but our own interconnects indicated it was all east and north of us. We monitored our control area by looking at instantaneous telemetry data. You could take a pencil and paper, and you could look at where your system was before and after an event like that and see where your power shifts to. And we knew our generators had to pick up to recover a loss somewhere in the U.S.

“We knew it wasn’t in the SPP; we could tell it was too big for that. … It was a pretty excited few moments because even here in Tulsa the frequency dropped several hertz. We thought we saw the big one coming right then.

“There were just two of us on shift that night. Immediately, I picked up the telephone and called the chief dispatcher and told him that we had a real problem on the interconnection. … Now back in those days, SPP had no one that could see this occur; they had no real-time data in Little Rock. It would have been discussed after the fact — after the dust had all settled — probably at a member meeting or an engineering/operating committee meeting.”

President Lyndon Johnson wrote to the president of the Federal Power Commission: “Today’s failure is a dramatic reminder of the importance of the uninterrupted flow of power to the health, safety and well-being of our citizens and the defense of our country. This failure should be immediately and carefully investigated in order to prevent a recurrence.”

The Federal Power Commission responded in less than a month with a report on the blackout and its recommendations. “Our study shows, first, that the cascading of the failure was not inevitable and should not recur if the precautions we recommend are observed —
Reliability became the key issue in the mind of the public and the government. Some lawmakers questioned the wisdom of relying on large electric grids and suggested they should be disconnected from each other. However, industry experts argued a single grid could be controlled by one organization capable of planning for failures and outages.

After much discussion and attempted legislation to create a council on power coordination, the electric industry established the National Electric Reliability Council (NERC) on June 1, 1968. SPP and 11 other regional and area organizations signed an agreement to “augment the reliability of bulk power supply in the electric utility systems of North America.” These 12 organizations essentially encompassed all of the power systems of the U.S. plus parts of Ontario, British Columbia and Manitoba in Canada.

In January 1970, NERC reorganized into nine regional organizations with two representatives from each region. The NERC agreement required its executive board to have at least two members from each ownership segment of the industry (e.g. investor-owned, municipal/state, federal and rural electric cooperatives).

The Southwest Regional Group also underwent changes during the period. In 1963, the North American Power Systems Interconnection Committee (NAPSIC) formed with SWRG as one of the 10 original members. In 1969, SWRG changed its name to South Central Systems of NAPSIC.

Déjà Vu All Over Again

Twelve years after the 1965 blackout, Dave Christiano experienced another major blackout in New York City — this time from the perspective of a Consolidated Edison employee.

Although smaller in scope than the 1965 event, the July 1977 blackout drew national attention as citywide looting, arson and violence broke out.

Christiano said he spent the next year working on the team that analyzed the causes and ramifications of the blackout.

and most of them are already being implemented by the industry; and, second, that well-integrated power pools add strength and reliability to service from all the interconnected systems,” the Commission observed. “The so-called CANUSE [Canada-US] network, within which the failure occurred, is not yet such an integrated power pool.”
REGIONAL RELIABILITY ORGANIZATION

The 1946 agreement for SPP charged the organization with four primary duties:

- Survey the present and future power requirements
- Study and develop plans covering the pooling of power resources of the participants
- Make recommendations for additional power capacity and interconnection and coordination of power sources
- Study and recommend plans for coordinating the systems with state and federal hydroelectric projects in the area.

Throughout the 1950s and into the 1960s, SPP’s role focused primarily on facilitating discussions and coordinating projects between member organizations to create the needed interconnections. It also set reserve requirements for member companies based on the recommendations of a subcommittee that studied projected generation and load. At this point, no regional scheduling existed.

“The rules were, if Kansas City Power and Light had excess power and Middle South was short on power, they had to find someone in between to buy the power from KCP&L and sell it to Middle South (with a markup, of course),” Jim McNabb of Associated Electric Cooperatives remembered.

Becoming a regional reliability organization reinforced SPP’s existing role of ensuring reliability within the pool.

“I don’t know that [SPP’s] role changed all that much,” McNabb said. “We knew what the problems were but not how to deal with them. We knew where the weaknesses were in the reliability system. …The presence of NERC kind of formalized what we were [already] doing.”

One of the first projects SPP undertook involved coordinating the development of the regional system planning model. McNabb said members were just learning to make use of power-flow studies and having an accurate representation of the big picture was critical to the organization. “It was impossible for [the individual members] to accumulate this data because that involved having an accurate representation of the transmission configuration, generation configuration and load settlement on the neighboring systems,” he explained.

Regional models allowed SPP members to see when and where they would need additional transmission lines and generation sources. “We depended on them for this transmis-
This was a major step forward, and SPP was doing things that desperately needed to be done," McNabb said.

SPP members agreed to reorganize and revamp their agreement to allow all types of systems to participate based on their bulk power size in relation to the total of the group. In December 1969, SPP Board Chairman Robert Welsh announced SPP had created a coordination agreement, and six additional power suppliers (three Rural Electrification Administration generation and transmission cooperatives and three municipalities) had joined the existing 20 electric companies and the Southwestern Power Administration “in a move to strengthen power line ties in the area.”

“Under the new agreement and with our new participants, we will be able to improve reliability and further reduce the possibility of major power failures, such as have plagued some other parts of the country,” Welsh added.

Welsh served double duty with SPP after Charles Custer died August 26, 1966.

“Mr. Custer died in the 1960s," Marschewski said. “When he died, I think [the board] wanted to take Mr. Hulsey under their wing a little bit. Mr. Welsh was the president of SWEPCO but also served as the executive director of SPP, and Mr. Hulsey was assistant executive director.”

After Bill Hulsey completed his acclimation period, Welsh stepped down during the summer of 1969, and the board named Hulsey executive director.
Between the years of 1947 to 1973, the electric power industry’s growth rate remained steady at approximately 8 percent per year while prices continued to decline.

Jim Schimpf, former director of rates at Entergy, recalled, “When the 1970s rolled around, fuel costs were two-tenths of a cent and had been that way for a long time. They [government forecasters] were telling us that with nuclear, rates were going to be so cheap that it was basically like getting free fuel.”

The 1970s proved to be more challenging than anticipated after a number of industry-shifting events occurred.

**CLEAN AIR AND ENDANGERED SPECIES**

Environmental awareness increased during the 1960s, and the government began to respond with legislation addressing issues such as air quality and the impact of development on the habitats for fish and wildlife.

Congress enacted the first Clean Air Act in 1963, as a measure to “improve, strengthen and accelerate programs for the prevention and abatement of air pollution.” This initial legislation implemented research programs to develop techniques for monitoring and controlling air pollution. The 1970 amendments expanded the scope of the original act and required
comprehensive federal and state regulations for industrial pollution sources as well as mobile (primarily automotive) sources.

At the August 1970 Board of Directors meeting, Balfour Jeffrey from Kansas Power and Light Company reported, “… there are now 20 federal agencies involved in environmental investigations. There is maximum confusion in Washington — and large expenditures. However, it is felt that there is a trend toward consolidation of all such study groups into one agency.”

Jeffrey was correct. The Environmental Protection Agency — established on December 2, 1970 — consolidated a variety of federal research, monitoring, standard-setting and enforcement activities into one agency mandated to ensure environmental protection.

SPP members had already felt pressure from these disjointed initiatives. At the December 1970 board meeting, one member commented that his operating people were required to report emissions from each unit and boiler. Another person noted there were 62 separate and distinct approvals required to build a nuclear plant in California.

Members were especially concerned about new regulations requiring utilities to reduce their emission of pollutants, which raised operating costs, especially for companies using coal-fired generation.

The Endangered Species Act of 1973 (ESA) also added new levels of complications for utility companies. Aimed at protecting the habitats of the endangered animals and plants, the Act had the power to suspend or shut down construction that threatened those habitats. The Smithsonian Institution, which was directed by the ESA to identify plant species in need of protection, produced a report identifying more than 3,000 threatened plants.

A summary prepared by an unidentified SPP employee stated, “We face many problems that cause delays and increase costs. Changes in the permitting process and new environmental regulations can usually be overcome by spending more money and accepting delay; the utility can feel confident that someday the project will be completed and can operate. With the Endangered Species Act, there is no recourse; the project must be halted no matter what the status of construction or even if it is in operation. This legislation must be amended to allow the balance originally intended.”
SHIFTING FROM CONSUMPTION TO CONSERVATION

Environmental awareness raised questions about fuel sources, but the Organization of the Petroleum Exporting Countries (OPEC) Oil Embargo of 1973–1974 quickly shifted the nation’s focus from consumption to conservation, and the utility companies began to investigate alternative fuels.

SPP member companies reassured consumers they were positioned to meet energy demands and emphasized the benefits of belonging to the power pool. Speaking at a Rotary Club meeting in Louisiana, John Edgar of Southwestern Electric Power Company (SWEPCO) told the audience the company was maintaining its 18 percent reserves and that its interconnections with other members would help provide all the energy that was needed. He also said many forms of energy were being investigated including “the possibility of burning ocean water [extracting deuterium from ocean water to use for nuclear fusion] and harnessing energy stored in ocean tides.”

President Richard Nixon announced an initiative called Project Independence on November 7, 1973. The initiative’s goal — to achieve energy self-sufficiency in the U.S. by 1980 through energy conservation and development of alternative sources of energy — led to changes including lowering highway speed limits to 55 mph, developing mass transit systems and completing the Trans-Alaska Pipeline System. For the electric utility industry, the project encouraged converting oil power plants to coal and answering President Nixon’s call for the construction of 1,000 nuclear power plants by the year 2000.

CHAIN REACTION: OCTOBER 17, 1973

The Organization of the Petroleum Exporting Countries (OPEC) began its policy of “oil diplomacy” by refusing to sell oil to any nation that had supported Israel in its “Yom Kippur War” with Egypt, Syria and Jordan.

The United States was highly dependent on OPEC oil, and the energy crises that followed the embargo resulted in a $97 billion drop in the total share value of the New York Stock Exchange and ushered in one of the worst recessions in U.S. history.

The price of oil skyrocketed, and severe gasoline shortages persisted as people waited in line for hours at gas stations.

By the time the embargo ended in March 1974, gas prices had jumped from an average of 38 cents to 84 cents per gallon.

Rising gas prices led to increased demand for smaller, more fuel-efficient cars. Most American car makers at the time focused on making large, “gas-guzzlers,” which led to increased sales of imports. That shift ultimately led to disaster for the auto industry in the United States.
NATIONAL ENERGY ACT OF 1978

Congress responded to the energy crises and its fallout by passing the National Energy Act of 1978. This legislation was intended to reduce dependence on foreign oil by developing renewable and alternative energy sources and encouraging the efficient use of fossil fuels.

One of the key pieces of legislation, the Powerplant and Industrial Fuel Use Act, restricted construction of power plants that used oil or natural gas as a primary fuel and encouraged the use of coal, nuclear energy and other alternative fuels.

Many SPP members traditionally fueled their generating units with natural gas, and this act caused a major shift from natural gas to coal and nuclear fuels.

The Public Utility Regulatory Policy Act (PURPA) — the second part of the National Energy Conservation Policy Act that directly affected the electric utility industry — addressed the need for quick alternatives to oil-fired generation. PURPA targeted environmentally conscious, energy-efficient commercial energy production and encouraged:

- Conservation of energy supplied by electric utilities
- Optimal efficiency of electric utility facilities and resources
- Equitable rates for electric consumers

PURPA defined a new class of energy producers called “qualifying facilities.” Qualifying facilities consisted of “small-scale producers” who generated energy for their own needs and had surplus energy available and “incidental producers” who generated usable electric energy as a byproduct of other activities.

PURPA required utility companies to purchase this energy (if the facility met established requirements for ownership, size and efficiency) based on a pricing structure referred to as “avoided cost rates.” Avoided cost rates meant the prices paid to the qualifying facilities weren’t based on their cost of producing the electricity but instead reflected what it would have cost the purchasing utility to generate that amount of power.

This shift allowed new players to enter the wholesale energy market, created a greater reliance on market forces to set wholesale power costs and became a catalyst for competition in the industry.
THREE-MILE ISLAND

Electric providers juggled many mandates and served many masters during the 1970s. Just as they were told coal was bad from an environmental standpoint, they were told coal was good because it reduced reliance on foreign oil. They also were charged to keep costs down while exploring and developing alternative energy sources. Many people looked to nuclear energy as the most viable alternative. D. M. Fowler, regional administrator of the Federal Energy Administration, reported Southwest Power Pool would have nine nuclear power plants instead of the one existing plant by 1985 and 20 percent of the electricity generated would come from nuclear power. That outlook changed after March 28, 1979.

On that day, the Three-Mile Island Unit 2 (TMI-2) reactor, located near Middletown, Pa., partially melted down, creating the most serious accident to date in the history of commercial nuclear power. Twelve days before the incident, “The China Syndrome” — a movie about an emergency nuclear plant shutdown — opened in theaters, so the incident ignited underlying fears about the potential dangers of nuclear power.

Investigations revealed the incident resulted from equipment malfunctions, design-related problems and worker error. Although the partial meltdown had no detectable health effects, it led to major changes in the nuclear power industry, altered the public’s perception of nuclear power and increased regulatory oversight.

All of the additional safety and environmental regulations that came after Three-Mile Island increased the construction time for a nuclear power plant to an average of 12 years (compared with six to eight years in other countries).

By early 1979, the nuclear industry forecasted having only 400 nuclear facilities in operation by the year 2000 — a massive drop from the goal of 1,000 plants called for in 1973.

THE BUTTERFLY EFFECT

SPP members benefited from having a central organization to help them stay on top of the policies, regulations and ever-shifting national priorities — for example, the impact of coal workers going on strike.

According to historian Michael Camp, a professor at Emory University, “One of the main components of the energy security plan was to encourage oil-fueled American electrical utilities to convert their equipment to burn coal instead, which the United States could produce domestically in abundance. This seemingly reasonable strategy proved highly difficult to execute successfully, since the United Mine Workers of America (UMWA) strike in winter 1977–78 greatly impacted [President Jimmy] Carter’s plans.”

Carter had counted on an abundant supply of coal to fuel the shift from dependence on foreign oil. To move forward with his initiative, the president directed the EPA to ‘speedily review’ any requests for temporary relaxation of Clean Air Act regulations.”
“In the middle 1970s, one company had eight nuclear units planned,” Pat Bourne recalled. “Construction had started to some degree on four of them, and they had four more under letters of intent. At the end of the day, they were lucky to finish one without going bankrupt.”

The industry looked to coal as an alternative to gas in the interim. In 1979, National Electric Reliability Council (NERC) forecasted that the utility industry would increase its coal consumption by 90 percent over the next decade — rising from 472.6 million tons to 897.6 million by 1988. The council noted that it anticipated the most rapid increase in coal use would occur within the SPP footprint.

**POOL POWER**

During the turbulence and challenges of the 1970s, SPP members continued to share information and insights as they formed committees and researched issues. Member companies continued to operate independently, but the interconnections proved valuable in many ways. Bourne explained, “This is an industry where the companies all take a long view. And, they’re all joined at the hip with each other. So, they have found ways to get along — to cooperate — because it’s in their long-term best interest.”

The South Central Systems of the North American Power Systems Interconnection Committee, which had remained a separate organization on paper but used SPP staff and facilities as resources, voted in 1973 to officially merge with SPP, and they completed the merger during 1974, which reinforced the relationships between the member companies.

When SPP members came together to discuss business at member and committee meetings, they also found time outside of the meetings to negotiate energy deals with one
another. A member with an energy need would hear something that spurred his interest from another meeting participant, and the two of them might reach a handshake deal to be followed by written contracts when they returned home.

All transactions between the companies occurred outside the scope of SPP. Jim McNabb recalled a “really bad, hot summer day, and we were short on generation” when he called Ron Hardage from [PSO] and asked for help. When Hardage agreed to help, McNabb said, “Well, don’t hurt us with the price.” McNabb said Hardage responded, “On days like this, I don’t make money, I make friends because the next week [the shoe is] going to be on the other foot.”

The SPP staff consisted of Executive Director Bill Hulsey and Maxine Orr until 1972 when they advertised for a staff engineer. John Marschewski, working in transmission planning for AP&L at the time, saw the advertisement and decided to apply for the job. Marschewski recalled the ad said to contact the personnel department, “I called, and Mr. Hulsey answered the phone; he was the personnel department and executive director as well!”

**COMPUTERIZATION**

During the 1970s, SPP conducted operating studies and created power-flow models in the offices of Utility Consulting Services (UCS) in Dallas, Texas. Frank Royster worked for UCS where he ran computer models for SPP.

“All the members of SPP would come into Dallas with gigantic boxes of IBM cards,” Royster said. “Each card contained pieces of information — a plant name, a generator name, number of megawatts, transmission line information, etc.”

The group would put the information together in different combinations to create various models. “If you were lucky, the job came back with either a solved case or an unsolved case. Frequently, however, you’d put in four or five boxes of data, and one of those cards would be wrong, and it would kick the whole job out. It was very frustrating,” Royster said.

When a hypothetical case was solved, the computer generated printouts on six-part paper. The engineers from the participating companies would review the information. Royster recalled that at one of the meetings, the group created a trophy called the Electric Banana that was given to the company that caused the most data problems.
The resulting power-flow models continued to change as they grew in complexity to encompass summer, winter and off-peak periods, and SPP grew more and more dependent upon the results of these studies. Studies called for more studies, and the Central Processing Units (CPUs) continued to grow along with the increasing cost of these studies. At the same time SPP was building its own regional power-flow models, it was building NERC multiregional models. SPP models ranged in size from 1,500 to 3,000 buses, but the NERC models could include up to 15,000 buses.

SPP decided to bring the work in-house to keep costs down while expanding the number and robustness of the studies. The plan included creating SPP’s first telecommunications network with remote terminal units at 20 control areas tied to a central computer at the SPP headquarters.

To complete the project, SPP purchased a PRIME 550 computer and hired Royster as the organization’s first information technology (IT) professional. The equipment and software cost approximately $200,000, which nearly doubled SPP’s 1979 budget.

The Prime 550 required an entire room for storage. Computer terminals installed in members’ control centers allowed them to submit information to SPP and share information with each other, creating SPP’s first telecommunications network, first data acquisition network and the basis for today’s SPPNet.

Bill Hulsey reported to the board that SPP’s actual expenditures were under budget by $50,000–$60,000 primarily because Royster had done all of the software development in-house.

After the system had become fully operational on October 20, 1980, R. O. Newman, SPP chairman and president of Public Service Company of Oklahoma told reporters, “The Prime 550 system is one example of the Southwest Power Pool’s constant search for new ways to provide our customers reliable, adequate energy at low cost. The future ability of the pool to reliably meet its growing obligations will depend on improved interconnected
operations, and that means better, more timely communication between SPP members.”

THE LONG, HOT SUMMER

Computer models provided a wealth of information for both long- and short-term planning, but no model could accurately predict the impact of weather.

Going into the summer of 1980, Hulsey reported SPP had a margin of better than 22 percent more generating capacity than it thought it would need. During that summer, however, atmospheric conditions produced an extended period of high temperatures. Many areas in the southern and Midwestern portions of the country reported lengthy periods with triple-digit temperatures.

Dallas, Texas, saw 42 straight days with temperatures over 100 degrees. In Arkansas, Governor Bill Clinton declared a state of emergency and requested $11.7 million in federal aid for the highway system after hundreds of miles of highway buckled and melted in the heat.

People stayed indoors and turned up their air conditioners to survive the devastating heat. “Nobody forecast what the load would be when the temperature hit 113 degrees in Little Rock,” said Walter D. Brown, executive vice president of NERC. By late July, SPP reported “the net operating capacity of the 41 utilities in the pool — that is, the capacity available after including all purchases of power from other pools — exceeded peak demand by a razor-thin 4.3 percent.”

The drought that accompanied the heat wave caused major drops in water levels at hydroelectric plants, and the stress from the heat caused more breakdowns than normal at

SPP MEMORIES: SPP’S FIRST COMPUTER

Malinda See remembered the Prime computer well: “It was huge. It had two memory cards that were the size of a pizza box, and each had a quarter of a megabyte of memory on it. So total, we had half a megabyte of memory. My iPhone now has more power in it than that computer had at the time.

“The back-up system was reel-to-reel tapes. One of my duties was to back up the computer once a week, and I had a little carrier case that would hold five of these big tapes. I would take the case home for the weekend as our backup. That was our disaster recovery plan!”
By the time the heat wave broke in early August, more than 1,700 people had died, and damage estimates soared into the billions of dollars. SPP committees and staff began to analyze information from that period to make adjustments. They presented their preliminary observations in November at the 1980 annual meeting of members, including these points:

- Forced outages for the past nine years have ranged from 12.1 percent to 21.1 percent as a percent of the coincidental peak load, and have on several occasions during the June to September period reached 18 percent. In 1980, 6,132 MW (14.2 percent of peak load) was forced out on July 15, the day of the pool peak of 43,288 megawatts. (On July 28, 7,376 megawatts or 17.0 percent was out of service due to forced outages.)

- On the day of the 1980 peak, pool members were purchasing about 2,700 megawatts from other Reliability Councils.

- Some systems showed generation capability, which was either not operable or restricted in output during extremely hot weather.

- Some systems essentially were without reserves at the time of peak. The difference between reported capability and actual is being reviewed by each system in the Pool.

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**STRUGGLING WITH THE ENERGY ENIGMA**


One of the sections, “Struggling with the Energy Enigma,” touched on issues that had been summarized in the preface, like this: “...simply meeting existing customer requirements today has become a challenge due to the number of powerful influences hampering energy production. Chief among these restrictive factors is the lack of a clearly established national energy policy, conflicting directives from state and federal regulatory bodies, the legislated need to replace existing oil- and gas-fueled power plants with ones fueled by coal and uranium, drawn-out licensing proceedings, environmental regulations and soaring construction costs.

“If providing for existing requirements has become a difficult task, meeting future demand will require even more resourcefulness from the members of the Southwest Power Pool.

“One fact is evident: The future ability of the Southwest Power Pool to meet its obligations to those it serves will center on increased coordination and planning among its members.”
LEAST COST UTILITY PLANNING

Between 1945 and 1970, the cost of generating power declined steadily as utilities built larger, more efficient power plants that reduced production costs. Rates to consumers also decreased as the utilities routinely requested rate reductions that mirrored their declining costs.

“This era was a win-win for everyone. Consumers had abundant, low-cost power; regulators oversaw declining rates, increased electrification and economic growth; and utilities and stockholders gained financially,” according to the U.S. Department of Energy.

During the OPEC oil embargo, the government encouraged the electric industry to build new sources of generation that relied on domestic coal and nuclear materials to reduce the country’s reliance on foreign oil. Inflation during that period caused construction costs to rise, and regulatory reaction to the Three-Mile Island incident added to the cost of the new nuclear plants as many safety measures were added to the specifications. For example, when Middle South Utilities (which included Arkansas Power and Light, Mississippi Power and Light and Louisiana Power and Light) announced plans for the Grand Gulf Nuclear Station located in Port Gibson, Mississippi, in 1970, the company estimated the construction cost at $1.2 billion. By the time the plant went online in 1985, the cost had risen to about $3.5 billion.

No one anticipated the effects that would result from the drop in demand resulting from the 1970s’ call for energy conservation and the poor economy of the early 1980s. Many companies had more generation sources than were needed and had to ask for rate increases to recover the cost of the new plants and their higher fixed costs.

In 1980, the SPP Engineering and Operating Committee reported that Don Hodel, president of NERC, told the committee the current situation “will lead to pressures for ‘governmentalization’ of utilities; this may not be nationalization or socialism, but it will be total control of the decision-making process.”
Regulators did become more involved with utility planning and implemented integrated resource planning (IRP), which required companies to evaluate alternatives to building new plants. These alternatives included demand-side management (conservation) and purchasing power wholesale from other energy companies instead of building new facilities.

Historically, utilities had viewed forecasting demand and planning generation as completely separate functions. The concept of least-cost utility planning (LCUP) sought to achieve demand-supply harmony through an integrated approach in which the traditional supply-side planning methods were coordinated with new methods of evaluating demand-side programs (programs intended to limit or reshape demand so that it could be met through existing generating capacity).

For SPP members, LCUP and IRP expanded their existing practice of buying and selling power from each other and increased their reliance on computer models to run various scenarios to determine the best alternatives. SPP’s Engineering and Operating Committee recommended that the day-to-day bargaining of the system dispatchers continue but that each company notify SPP on an hourly basis of the capacity it had available and its price, or notify SPP of any capacity a company wished to purchase and the price it was willing to pay so that SPP members could realize additional economies.


“It was a new position within the planning department, which from what I understood was kind of rare, because it was a very conservative company,” Brown said. “The primary reason for adding the position was all of the interregional activities going on. So Southwest Power Pool, as an organization, was becoming more meaningful to the utilities and the footprint at the time. All of the companies were staffing to get more involved in those interregional activities.”

By the late 1980s and early 1990s, electric utilities had a greater focus on selling their generation through wholesale transactions. This shift coincided with a national push for free markets as traditionally regulated industries grew. Price regulations were lifted in many areas including securities, banking, airlines, truck-
ing, telecommunications and natural gas as politicians and economists argued that regulation had outlived its value and the public could be better served by letting the markets determine pricing. Advocates for deregulating the electricity industry argued that PURPA had proved nonutility generators could produce power as inexpensively and effectively as regulated utilities. Large industrial consumers searching for lower prices also urged federal regulators to pursue deregulation. The Federal Energy Regulatory Commission (FERC) began to allow utilities to shift from cost-based rates to market-based rates, and by 1991, the commission had received 40 market-based pricing requests.

**SPP TRANSITIONS**

Bill Hulsey retired in 1985, and the board chose Marion McKay “Mac” Riggs to succeed him. “Mac was a transition between Bill Hulsey and John Marschewski,” Brown said. “Bill hadn’t developed John to take over, so Mac Riggs was brought in to assess and develop the organization.

“He had retired from AP&L and agreed to come in and be this transition development person, and then they turned it over to John [in 1989].”

Riggs — who had served on numerous NERC committees responsible for setting planning standards and assessing the state of bulk electric system reliability in the nation — introduced Marschewski to national and international industry participants and groomed him for the leadership role.

**SPP MEMORIES: PLAZA WEST**

Claudia Milam, who joined SPP in 1979 as employee No. 4, remembered the day in 1981 when a tornado came through the area.

“Mr. Hulsey had gone to the AP&L building downtown, so he wasn’t here when it hit,” Milam said. “It lifted the roof off the nursing home next door and put it back down again.

“It hit right at 3:00 when the kids at Catholic High were getting out, so there were cars everywhere, kids everywhere. And, it sucked out all the windows on the south side of the 12th floor. I’ll never forget leaving and seeing the curtains flying out the window because there were papers and glass all over the parking lot.

“It was the scariest thing I’ve ever been in.”

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“That building was on one of the highest elevations in Little Rock, and the transmission lines and distribution lines were much lower,” Barbara Sugg recalled.

Occasionally helicopters from Entergy would fly by to inspect a nearby substation or the power lines. “You’d be sitting in your office working and all of a sudden a helicopter would buzz by your window,” Sugg said.

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“We each had a key to the building,” Bruce Rew said. “They didn’t have badges or anything like that. So if you wanted to come in at night, you had a key and could unlock it and go in.”

He also told the story about one weekend when John Marschewski accidentally locked himself out of the building. “He waited for another tenant to let him in the building, and he climbed over the wall to get in the office” by removing the false ceiling tiles from the hallway.
See was the first female employee hired to perform technical work, and Brown recalled she was the first person in the office who was unafraid to stand up to Maxine Orr, the longtime executive secretary.

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See’s first impressions of Brown were favorable, too. “Nick was very ambitious and eager to learn — lots of energy; lots of enthusiasm,” she said.

During the late 1980s, the SPP Board of Directors approved several initiatives to upgrade and expand the pool’s capabilities, including:

- Developing a self-paced SPP Operator Training Program
- Purchasing a PTI computer software package to be used in load flow and short-circuit model development
- Purchasing a MicroGADS software package for member systems to report monthly generator outages
- Digitizing the SPP transmission one-line map
- Installing a region-wide emergency radio communication network to use in case of catastrophic bulk power interruptions

“The member companies had new challenges, and SPP was helping the companies collaborate on responses to these developments,” Pat Bourne said.
Chapter 4: Centralized Markets and the Move to Formality (1990–1997)

Former SPP President John Marschewski recalled his first dialogue with the SPP board after being selected to succeed Mac Riggs.

“I told them it’s important to recognize our priorities in life and that there are things more important than my job — my relationship with the Lord and my relationship with the family,” Marschewski said. “And, our second most important [priority] was people. That’s why I felt if you had good people, the other things would take care of themselves. And third, was always be truthful with people — then you wouldn’t have to worry about what you said. Culturally, that was how we operated.”

Marschewski relied on Nick Brown to help him lead SPP.

“John was focused on the external and dealing with members and the outside relationships, and I was to build the internal organization,” Brown said. “That was my primary focus during the early years.”

In 1990, Brown hired his first employee, Bruce Rew, who joined the organization as a planning engineer straight out of college.

Rew, now SPP’s Vice President of Operations, remembered one of the first projects SPP completed during that period — an operating reserve program the board approved in 1991.
“For the first time, members had access to a pool of generation resources they could call on for unit outages. The new system allowed SPP, as a region, to promptly respond and assist members in need,” Rew said. “That was a big deal nationally because we still had individual balancing authorities but shared reserves. It provided a lot of financial savings to the members — especially the smaller members because they were required to have enough generation to respond to an outage themselves, but this way they would only have a fraction of that requirement.”

**ENERGY POLICY ACT OF 1992**

Congress passed the Energy Policy Act of 1992 (EPAct92) to set goals, create mandates and amend utility laws to increase clean energy use and improve overall energy efficiency in the United States. The Act’s 27 titles detailed various measures designed to lessen the nation’s dependence on imported energy, provide incentives for clean and renewable energy and promote energy conservation.

EPAct92 became law on October 24, 1992, and it substantially changed the electric utility industry by:

- Creating a framework for a competitive wholesale electricity generation market
- Creating a new class of electric suppliers — the exempt wholesale generator — who did not own transmission facilities or sell electricity in the retail market; their rates were determined by the market instead of through regulation
- Giving the Federal Energy Regulatory Commission (FERC) the authority to require utilities to provide access to their transmission systems on a case-by-case basis
- Requiring states to conduct an integrated resource planning process and evaluate the impact of purchased power contracts

**SMALL ADJUSTMENTS YIELD BIG SAVINGS**

From the beginning, reserve-sharing provided a major benefit to SPP members. Instead of each utility having to build extra capacity to meet reserve requirements, members could rely on other pool members to provide extra power when needed — lowering the need to build additional capacity as demand grew.

In 1992, SPP established procedures for automatic sharing of reserve for recovery from generating losses.

“Notification of contingencies is quickly distributed to neighboring control areas by the high-speed communication network called SPPNET,” according to the 1994 Annual Report. “Recovery from unit losses is accomplished more quickly by many control areas promptly scheduling assistance. Following nearly two years of successful operation, it was determined that reliable system operation could be maintained at a lower operating reserve level.”

In December 1994, the SPP board approved a reduction in the minimum operating reserve that resulted in more than $20 million in savings for pool members.
“As its most important effect, EPAct will stimulate a more competitive and less vertically integrated electric power industry,” according to a report generated by the National Regulatory Research Institute in 1993. “Amendments to the Public Utility Holding Company Act of 1935 lift barriers to the development of wholesale power facilities by both traditional vertically integrated utilities and independent power generators. Changes in the Federal Power Act greatly expanded FERC’s authority to order wheeling under a wide range of conditions. Since it is likely that competition will permeate through the industry, state public utility commissions, at some point, will be faced with tough decisions regarding such issues as pricing, stranded investment and the obligation of utilities to serve customers.”

This landmark law took privately owned transmission assets and made them public — utilities could no longer use their transmission assets solely for their benefit.

**SPP TURNS 50**

SPP celebrated its 50th anniversary at the Excelsior Hotel in Little Rock. The theme for the event was “Lighting the Past — Powering the Future.” More than 200 people attended the celebration, and each guest received a commemorative sculpture designed by Roger Reith of Washington, D.C. SPP also unveiled a new logo.

SPP at the time consisted of 44 member companies in Arkansas, Louisiana, Mississippi, Missouri, Kansas, Oklahoma, Texas and New Mexico representing:

- 17 investor-owned utilities
- 12 municipal systems
- 11 generation and transmission cooperatives
- three state authorities/one federal agency
REGIONAL TRANSMISSION GROUPS

The basic structure and functions of SPP hadn’t changed much during the past 50 years, but the leadership realized they needed to be prepared for the changes that were on the horizon.

SPP held a strategic planning retreat in 1992 to decide how the organization should proceed to position itself following EPAct92’s implementation. The group created a strategic plan for the organization and the first iteration of a mission statement: “Helping our members work to keep the lights on today and in the future.”

SPP Board Chairman Bill Helton from Southwestern Public Service Company unveiled the SPP strategic plan at the November 10, 1992, board meeting.

“Our Coordination Agreement must be revised,” Helton said. “We are seen by some as a ‘club.’ Our membership must be made open to all who impact electric system reliability. Also, we must provide a mechanism for reliability-related dispute resolution.”

The strategic plan was approved on November 10, 1992. On the same day, FERC invited comments on a proposed standard for FERC certification of Regional Transmission Groups (RTGs).

The FERC proposal set out several criteria for certification that would require RTGs to:

- Include a region of sufficient size to provide reliable and efficient transmission service
- Provide for open membership to buyers and sellers of transmission service in the region
- Impose an obligation to provide transmission service including building transmission when necessary to provide reasonable and reliable service
- Facilitate joint transmission planning to accommodate known requirements of members and nonmembers within, into, out of and through the region

THE ROAD TO DEREGULATION

The roots of deregulation for the electric industry began in the 1970s when PURPA created a structure for independent power producers to enter the wholesale market.

Traditionally, utility companies were vertically integrated – each utility company was responsible for power generation, transmission and distribution to the end user (customers). The companies might buy power from other members in a power pool in times of need, but each operated as a fully integrated utility.

Part of the deregulation movement involved breaking up utility companies into separate generation, transmission and distribution companies and removing pricing regulation at the wholesale level.

Distribution companies, which deliver power to the final customers, continued to be regulated while generation companies competed to see who could sell power as a commodity at the lowest price in an open market.
Include rules for decision-making reflecting the interests of all members

Create a consensually crafted mechanism for dispute resolution that limits the necessity of invoking FERC procedures and remedies

The Department of Justice issued comments supporting FERC’s proposal and stated in part:

RTGs offer a potentially useful device for obtaining significant potential efficiencies by coordinating regional planning, facilitating bulk power transactions, optimizing grid usage and developing efficient expansion of the grid, all while maximizing reliance on privately negotiated transactions. RTGs will serve as a clearinghouse for information concerning all transmission users, not just native-load customers. RTGs can make known long-term needs for transmission in or through a region; transmission planners can more efficiently design, expand and operate the grid to accommodate these needs on a regional basis. Planning and operation of transmission lines throughout an entire regional grid will allow utilities to accommodate the maximum number of service requests in a timely manner and to take advantage of economies of scale inherent in transmission facilities.

In November 1993, the board approved a new membership agreement, and Chairman Greg Nesbitt from Central Louisiana Electric Co. appointed a task force to determine if SPP should become a FERC-recognized RTG, and if so, what changes to the governing agreements would be necessary.

SPP MEMORIES: JULY 20, 1993

On the afternoon of July 20, 1993, the system operators of 10 SPP members were very busy dealing with a series of more than 35 transmission circuit interruptions, which resulted in the loss or reduction of over 300 megawatts of load.

“It was due to lack of tree trimming,” Nick Brown explained. “It was a hot day, and when lines get loaded, they sag. And if we don’t trim trees, they come into contact with trees in the right-of-way, and they trip out. When they trip out, all of the current that was being carried by that line transfers to another line, which makes it overloaded. Then it sags, and it trips out. So, it becomes this cascading event.”

The interruptions centered on the four-state border of Oklahoma, Kansas, Missouri and Arkansas and caused much damage to equipment because of sustained periods of low voltage on motors.

This event remains the single largest in SPP’s history, and it emphasized the problems associated with not having real-time data.

“Any system disturbances would take us months to just gather data, and then, the challenge with a lot of that data was the time syncing of that data between utilities – because they would be old analog charts on the wall with line flows,” Brown said. “If a 345-kV line tripped, you would see a jump, and you were able to kind of start lining things up and putting pieces together. But, it took us months to really analyze what occurred.”
One thing was clear: SPP would have to adapt to meet FERC’s requirements regardless of what form the new coordination requirements took.

**SOUTHWEST POWER POOL, INC.**

Creating a formal organization was a new experience for the SPP staff. “We did stuff that we really didn’t have the expertise to do,” Brown said. “I drafted our bylaws. When we incorporated, John and I went down to the Secretary of State’s office. … There was a form, and we filled in the blanks, and we made the filing with the IRS for our tax exemption. … We didn’t have an attorney.”

The Arkansas Secretary of State’s office issued SPP’s incorporation certificate on January 3, 1994, marking the beginning of the modern era for the organization.

“For 75 years SPP has coordinated the reliability of the bulk electric grid, operating for much of that time with no more than a one-paragraph membership agreement and a handshake between our member companies,” Brown said. “From our founding in 1941 until our incorporation in 1994, we facilitated interstate commerce, wrote standards to ensure nationwide reliability, and ensured the lights stayed on across our footprint … all before we legally existed and based entirely on the strength of our relationships.”
The RTG question remained a hot topic. In the chairman’s message of SPP’s 1994 Annual Report, Nesbitt reported: “To maintain SPP’s position as the regional reliability authority, we worked all year seeking consensus on the critical issue of recognition, as a Regional Transmission Group. This process has been described as trying to keep frogs in a wheelbarrow. Even so, we must continue to address these challenges within the industry.”

Nesbitt outlined the benefits of becoming an RTG:

- Official recognition as the regional reliability authority by FERC
- Defeance by FERC to agreements made between members
- Defeance by FERC to the resolution of disputes within the SPP organization
- Authority over regional transmission access and pricing

SPP already performed many of the functions proposed for the RTGs in its role as a Regional Reliability Council, and FERC Commissioner William Massey encouraged the reliability councils to seek RTG status.

“It would make no sense for there to be two transmission-related organizations in the same geographic area, one focused on reliability and the other on the economic issues of access and pricing,” Massey said. “Perhaps I’m wrong, but I see no good reason to have two separate groups monitoring and guiding the development and operation of the very same regional transmission grid.”

To address open transmission issues, SPP formed the Transmission Access Committee with three membership categories: transmission, transmission-dependent and transmission-dependent solely engaged in the business of selling electric energy or purchasing electric energy for resale. SPP also reached out to federal and state regulatory agencies asking them to designate one observer each to both the Board of Directors and to the Engineering and Operating Committee.

By 1995, the push for forming RTGs had waned.

“A few RTGs were established, but their role has been limited,” According to a report issued by the Energy Information Administration in 2000. “Although effective for planning purposes, these organizations were usually not vested with appropriate decision-making authority needed to address transmission issues affecting an entire region.”

Nesbitt summed up the situation by saying, “Our central agenda item during 1994 was SPP’s consideration of becoming a Regional Transmission Group. While pursuit of the
During 1995, SPP membership grew to 53 organizations. The number of energy-marketer members grew by 350 percent—from two to nine companies. These companies owned no generators or transmission lines, and they did not provide electricity to consumers. Instead, they bought and sold electricity as a commodity. One of the largest companies was Enron, which had joined SPP in March 1994.

Federal Energy Regulatory Commission recognition as an RTG was not on our specific agenda during 1995, related issues were. SPP currently provides nearly all of the basic characteristics of a RTG, and then some. The difference during 1995 was that we focused on what decisions we needed to make, rather than how decisions should be made.”

The SPP board agreed to defer indefinitely filing to become an RTG and instead focused on items that would clearly benefit the members — and on which everyone could agree. Fiscal administration structure was one of the questions the board addressed.

Since its inception, SPP had been closely linked with Arkansas Power and Light Company. AP&L served as the conduit through which energy had been supplied to the aluminum processing plant during World War II, as well as the conduit for the fiscal functions needed to run SPP. Until 1995 — when SPP set up independent financial administration with its own separate payroll and benefits program — SPP employees technically were employees of AP&L. Although SPP functioned separately from AP&L, the board and staff thought a clean separation would help SPP avoid any perception of bias from the ever-growing roster of members and from regulatory agencies.

**NEXT HOUR ENERGY EXCHANGE**

During 1995, SPP membership grew to 53 organizations. The number of energy-marketer members grew by 350 percent—from two to nine companies. These companies owned no generators or transmission lines, and they did not provide electricity to consumers. Instead, they bought and sold electricity as a commodity. One of the largest companies was Enron, which had joined SPP in March 1994.

At that time, SPP members had to contact each other directly to find power available for purchase on a short-term basis, so shopping for the best deal meant multiple phone calls or faxes.

“Nobody was keeping up with all the things happening,” Brown remembered. “You’ve got all these transactions going on, and transactions were very localized because they were all arranged on the phone. It was one operator going, ‘Hey, my load next hour is going to be X; have you got anything to sell, and what would the price be?’ You can only do so many deals when it is just one person calling his neighbors.”

SPP proposed creating a computer system that would enable its members to post buy and sell orders for next-hour energy.
Creating the Next-Hour Energy Exchange involved SPP members and staff at many levels:

- The Task Force on Access and Planning created the criteria for defining an approach for the exchange.
- The Performance Working Group finalized operational details and recommended fine-tuning criteria modifications to provide a more flexible and effective exchange system.
- The Operating Subcommittee, Engineering and Operating Committee and Board of Directors approved these modifications.
- SPP staff replaced the old text-based computer system members had been using for the past eight years with a faster, more user-friendly graphical interface and developed the software to support the Next-Hour Energy Exchange.

SPP set up the energy exchange under the rates, terms and conditions of the Western Systems Power Pool (WSPP) agreement. Use of WSPP’s FERC-approved agreements avoided the delays and uncertainties of a separate filing and allowed market-based rates for all participants, which were not available by using existing bilateral agreements.

When the system went live in August 1996, buyers or sellers could consummate a deal through a point-and-click method, selecting both energy and transmission services in one step. The first energy exchanged occurred on August 22, 1996, for the hour ending 1:00 p.m. between Grand River Dam Authority and Western Farmers Electric Cooperatives.

**TRANSMISSION RATING CRITERIA AND SYSTEM OPERATOR CERTIFICATION**

SPP undertook two additional initiatives to create standardization and quality control among the members.

First, they created transmission-rating criteria. SPP had created uniform rating criteria for generating equipment a decade earlier and now turned its attention to transmission equipment.

“We defined how the transmission owners rate the transmission lines,” Bruce Rew said. “We set up criteria that provided specifics on how each company would determine the number of amps equipment should be capable of. Equipment rating inputs such as wind speed and ambient temperature would be consistent across the region. We didn’t want two companies that had the same size wire with dramatically different ratings.”
SPP wanted to ensure facilities were not being rated too conservatively, which would unduly restrict transfer capability. Criteria was developed using industry standards and applied to all transmission equipment that operated at 69 kV and above and specified a minimum rating where equipment could safely operate without loss of life.

“We had a couple of members who were against that,” Rew remembered. “We had to go through several meetings where we didn’t get the vote, and we made some adjustments and finally got it approved. That’s the type of culture that we had — where we were able to come to the table and talk through important policies for the benefit of everyone.”

SPP also became the first NERC Regional Council to require each control area have at least one certified system operator on duty at all times, effective January 1, 1998. Certification consisted of attending a three-day course and passing a test on NERC Operating Policies and SPP Criteria. SPP hosted four training courses during 1995, producing the first 84 certified system operators. They estimated at least 320 system operators, supervisors, dispatchers and other operations personnel would achieve certification by 1998.

In “The Autocrat of the Breakfast Table,” Oliver Wendell Holmes wrote: “I find the great thing in this world is not so much where we stand, as in what direction we are moving: To reach the port of heaven, we must sail sometimes with the wind and sometimes against it — but we must sail, and not drift, nor lie at anchor.”

Up until 1996, the winds of change had stirred up the industry, but the main gust came in 1996 when The Federal Energy Regulatory Commission (FERC) issued the most far-reaching and ambitious portion of its plan to eliminate impediments to a competitive wholesale power market — Orders 888 and 889.

ORDER 888 — STANDARDS OF CONDUCT

When FERC issued Order 888 in April 1996, it established and promoted competition in the generation market by ensuring fair access and market treatment of transmission customers by:

- Requiring all U.S. utilities to file an Open Access Transmission Tariff (OATT)
- Requiring investor-owned utilities to unbundle transmission services from wholesale generation and power marketing
- Creating Independent System Operators (ISOs) and establishing operating guidelines
- Allowing utilities to recover stranded costs they might accrue in the transition to competitive markets
This order created a separation of the power schedulers (generation), power marketers, and transmission operators within vertically integrated utility companies. Transmission operators had to treat these internal divisions as if they were outside customers. Also, utility companies that had invested heavily in transmission lines could no longer use those assets for a competitive advantage.

The order addressed FERC’s concern that many vertically integrated utilities did not allow independent power suppliers to use their transmission systems, and if they were ordered to provide access, the integrated utilities would favor power from their own plants over the independent supplier when the transmission lines became congested.

Order 888 also required transmission operators provide timely and accurate day-to-day information about transmission to all transmission users.

Order 888 went into effect on July 9, 1996.

ORDER 889 — OPEN ACCESS SAME-TIME INFORMATION SYSTEM

FERC concurrently issued Order 889, which detailed exactly how the various participants in the electricity market would interact with transmission providers. It established the structure and function of what came to be known as the Open Access Same-time Information System (OASIS).

OASIS consisted of “nodes” — web-based interfaces to each transmission system — that fed information on available transmission capacity, capacity reservations, ancillary services and transmission prices into an interactive database that served as a portal for transmission service requests.

The underlying idea of the OASIS was to create an interactive computerized market for transmission-related products and services that would be accessible to all qualified users of the transmission system. In that role, the OASIS facilitated the functioning of competitive power markets.

Implementing the system required some fairly sophisticated technology for the time, and few people in the industry had the computer knowledge and development skills needed.
SPP members decided instead of each member having a separate OASIS node that connected into the main system, SPP should establish a regional OASIS with each member company having a node off of SPP.

SPP joined other National Electric Reliability Council (NERC) regions in implementing the SPP node on a multiregional system. The joint project offered transmission providers and users single-point access to all information on the interregional system with a common look and feel.

“The minute people had unfettered access to somebody else’s transmission system, wholesale transactions started taking off,” Nick Brown said. “Bulk power marketers entered the picture — Enron and Dynegy were the two large ones in our footprint. And, going out and understanding where there was spare capacity and where there may be a need, really helped create a lot of activity as the system began opening up.”

STAYING FOCUSED

The world was changing rapidly for SPP members, and the entire organization felt the stress as it adapted to the new rules of the road.

In his chairman’s statement for the 1996 Annual Report, Jim Jura from Associated Electric Cooperative wrote, “I’m sure you gained a certain familiarity with the SPP letterhead during the past year as the staff distributed numerous meeting notices, strategic initiative reports and policy modifications requesting your action, comments and support. I encourage you not to become numbed by these frequent distributions and postpone response to their content. Industry standards are changing at such a rapid pace that your input must be provided in a timely manner in order to count.”

Jura also noted it was clear from the member responses there were many different opinions on the future industry direction and how SPP should respond.

Some of the division stemmed from the changing makeup of the pool’s membership. In 1996, the number of marketing companies jumped again — from nine to 22 — which meant a full third of SPP’s membership consisted of marketers. At SPP’s 1996 summer conference, Jeff Skilling, chairman and CEO of Enron Capital and Trade Resources, challenged participants to think about the supply of energy in new and innovative ways to capture benefits of resources in new and innovative ways.
“To me, we kind of transitioned from the transmission owners focusing on our native customers — and generally bonding together to serve our native customers — to this open market,” Mel Perkins from Oklahoma Gas and Electric explained. “Then all of a sudden, the transmission owners kind of went from being enablers to being viewed somewhat as inhibitors.

“I can’t take all of these marketers and put them in the same bucket,” he added. “There were those that came from investor-owned, municipal or other load-serving entities, and they kind of understood that [obligation to serve]. But, many of them didn’t. They weren’t bringing an obligation to the table; they just wanted to play the market and see how many deals could be made.”

Tenaska Power Services joined SPP during this period, and Trudy Harper, former president of Tenaska Power Services Co., remembers her initial concerns about joining the pool as a marketing company. “Change is always hard, and there were many changes in the power industry in the late 1990’s,” says Harper. “SPP, along with most other traditional utility organizations, was confronting a need to accept non-utility entrants into their market. I knew Nick Brown from some earlier work that we had done together at NERC, so when Tenaska decided to enter the SPP market, I reached out to Nick to ‘warn him that we were headed their way.’ Nick and John Marschewski met with Mark Foreman and me, and they made it clear that they were happy to have us in their market.

“I remember telling Mark on the way home that I was surprised at how sincere they sounded when they said it (because I strongly suspected that they were as resistant to change as anyone else). While it was clear that a few of the utility folks involved in SPP were not happy about having non-utilities involved in their business, most of the folks that we dealt with at SPP (both staff and members) were very respectful and welcoming.
“I am fairly certain that over time even the most resistant of the utility folks came to appreciate that we sincerely wanted to make a positive contribution to Southwest Power Pool and its core business.”

SPP worked to juggle the priorities and reach consensus among its various member groups.

“SPP is to be commended for its progressive approach to integrating third-party marketers into the organization and the thoughtful way it is considering regional transmission pricing,” Paula Rosput from PanEnergy Power Services said.

Staying true to the organization’s mission statement — “Helping our members work together to keep the lights on … today and in the future” — kept the group focused.

“SPP was the authority on electric reliability in our region when [rate] regulation was predominant,” Nesbitt told fellow members. “It is making the changes necessary to maintain that position as competition becomes an equally important factor. Our reliability expertise is now more important than ever.”

INDEPENDENT SYSTEM OPERATORS

In Order 888, FERC introduced the concept of Independent System Operators (ISOs) as a way for existing power pools to provide nondiscriminatory access to transmission. It called for utilities voluntarily to transfer operating control of their transmission facilities to the ISO.

FERC thought ISOs with no economic interest in marketing and selling power could administer the Open Access Transmission Tariff fairly and eliminate discriminatory practices while achieving the efficiency benefits from regional control of the grid. ISOs also could provide market-monitoring oversight.

Members had many questions and concerns about seeking ISO status — especially after having put a considerable amount of time contemplating the Regional Transmission Group structure.

“SPP had collaborated with its members on the merit of forming an RTG,” Pat Bourne explained. “But, the evolution of things was going so fast that by the time the collaboration had agreed to pursue a regional transmission group, FERC had issued a position on Independent System Operators and then Regional Transmission Organizations — it felt like the ‘concept du jour.’”
In August 1997, the SPP ISO Task Force used SPP’s Summer Conference as a public workshop to inform and seek comment from all interested parties. The workshop included five-panel sessions that touched on the members’ main areas of concern:

- Benefits for Participants — What’s in This for You
- ISO Creation/Evolution Process — How to Get from Here to There
- Operational Necessities — How to Keep Things Working Reliably
- Responding to the Market — How to Ensure Commercial Viability
- Administrative Issues — Who’s in Charge and Who Pays

“As chairman of the board, I assure you we will move ahead with staged development,” Jim Jura said in closing the conference. “There are benefits, and there are costs. The challenge is on the task force and staff to put a viable plan on the table for consideration.”

REGIONAL SECURITY COORDINATION

While FERC worked to open up competition in the market, the North American Reliability Corporation (NERC) continued to focus on reliability standards.

In the midst of the debate about becoming a FERC-authorized ISO, SPP moved ahead with a plan to become a regional security coordinator for NERC. In November 1996, the Board of Directors gave final approval to create a round-the-clock security center in the SPP offices. The plan called for exchange of near real-time operating information and 24/7 security coordination performed by the SPP staff.

Brown summed up the need for the coordination: “With Open Access Same-time Information Systems [OASIS], you’ve got marketers out there that were buying and selling and nobody in between really knew what was going on. They would just say, ‘I need 500 megawatts of transmission service,’ and the power would come into Central and South West Services (CSW) from Oklahoma Gas and Electric as 500 megawatts, but it might leave CSW in five different directions. Nobody had all the pieces, and so our members agreed it made sense for SPP to be the independent security coordinator.”

“I remember Nick coming in saying we were going to start a 24-hour operation center, and that was like ‘Wow!’ It was hard to envision at that time — having a quarter of one floor in Plaza West — that we’d get to that point someday,” Bruce Rew said.
Lanny Nickell, who joined SPP in May 1997 as an operations support engineer, described SPP as more of an engineering shop before the company began real-time operations.

“We didn’t have a 24/7 support of that function,” Nickell added. “A couple of folks were on call, and if something happened to the network, they’d be contacted. It was the members that were doing all the operations and all the planning. The staff that we had at the time just facilitated the development of the standards that they used.”

Nickell was one of many new hires in 1997. The board budgeted to double the SPP staff from 14 to 28 people in anticipation of developing and staffing the security coordination center and to support other initiatives including exploring ISO status and creating a regional tariff.

Pat Bourne from Gulf States Utilities, who had considerable experience working with tariffs; Carl Monroe from Middle South Utilities, who came to manage the information technology department; and Barbara Sugg from Louisiana Energy and Power Authority, who came to do software development all joined SPP that year.

Brown hired Bill Phillips from Entergy in 1996 to oversee the new security coordination operation, and Mike Thomas became the first operator when Phillips hired him in June 1997. SPP deliberately sought to hire people from member organizations. The Human Resources Committee approved a plan to credit years of service to any employee who came to SPP from a member system.

“SPP wanted to hire from the member companies because the learning curve is much shorter,” Sugg explained. “If you’ve done it on the member side, we don’t have to teach you what ‘it’ is. We just have to teach you the SPP side of it.”

The member organizations supported this strategy, as it allowed them more involvement in the business process.
“It’s like, ‘If I’m turning all my assets over, I kind of want some of my own people in there,’” Brown said. He acknowledged the operational challenges the organization faced during this period. “That was huge for members to turn over — to give up that kind of responsibility and authority — to a fledgling organization.”

Before Order 888 was established, interconnected companies could constrain SPP’s ability to do business with others, said Dave Christiano, then with City Utilities of Springfield.

“Typically, what they did was they refused to wheel power across their system — they didn’t want to be a common carrier like a railroad or a highway,” Christiano said. “Let’s say you were connected to them but not to the next company over. They didn’t want you doing business with the next company over. So, they would say, ‘Well, we’ll buy the power and resell it [to you].’ Then that way they could charge you whatever they wanted or essentially refuse to do a deal with you.”

Members realized they needed to work together with their neighbors to move ahead, Gerry Burrows of Kansas City Power and Light said.

“The industry was changing, and they had to change with it,” Burrows said. “There was a developing market, and the marketing forces and the loading on the system — they were going to have to work closely together to maintain reliability. Reliability was a driving issue.”

The regional security center began full-time operations on December 29, 1997.

**TARIFF TALKS**

Undertaking regional security coordination (now referred to as reliability coordination) provided a real-time, bird’s-eye view of the system and allowed SPP to address transmission problems quickly.

As the members began to realize the benefits of being able to unwind the system on a coordinated basis, they began to wonder if they should sell power on a coordinated basis, too. SPP investigated the idea of creating a single tariff (the rates, terms and conditions under which power would be sold).

“We had 19 different transmission tariffs in our footprint at the time,” Brown explained. “Some people would sell next-hour service; some wouldn’t. Some would only sell in half-day increments; some would only sell in full-day increments. Some would sell hourly service, but you had to contract for it the day before. Some would sell you next-hour service within
the hour or this-hour service. So if you were going to move power from Southwestern Public Service Company to Clarksdale, Mississippi, you would still have to contact five transmission owners and arrange for transmission service to make it happen. If you were a really aggressive marketer, you could put all those transactions together.”

Transmission owners fell into two camps. One group saw the advantages of a regional tariff — one-stop shopping with consistent rates, terms and conditions; no questions about the tariff’s structure or implementation; no audits; and the realization that with the strategic advantage of owning the transmission lines removed, there was no upside to administering it.

“The other side was almost a 'just say no' camp,” Brown explained. “They said, 'By golly, it’s my asset, and I’ll manage my asset. Even if I have to open it up to somebody else, at least I’m going to be the last person that says yes or no.'”

In the end, the question came down to how to price transmission service on a regional basis. The Pricing Methodology Task Force explored options ranging from a “postage stamp” rate (a transaction-based rate — you pay a rate and go anywhere you want regardless of distance) to “megawatt-mile” pricing (a distance-based rate).

Much debate ensued. Transmission owners wanted megawatt-mile pricing. Transmission-dependent members wanted postage-stamp pricing. Entergy Corporation, which owned five of SPP’s member companies, insisted on distance-based pricing, which brought the discussion to a stand-still.

Brown, who was serving as the facilitator for the group, saw the problems with distance-based pricing.

“I’m the engineer, and I love the mathematical approach to distance-based pricing, but it was going to put a huge burden on our staff. The administrative burden of that kind of pricing mechanism was huge,” he explained.

But, he recognized the only way to move forward was to gain consensus, so he sought to break the impasse by talking to the advocates for postage-stamp pricing.
“I said, ‘Today you don’t have a [regional] tariff. Do you want a tariff?’ And they said yes,” Brown remembered. “And I said, ‘Is a regional tariff with distance-based pricing better than what your situation is today?’”

When the transmission-dependent group realized the only way to gain a lot was to give a little, discussions resumed and the group prepared a recommendation to the board using megawatt-mile pricing.

A VERY SCARY HALLOWEEN

Even with the concession on distance-based pricing, some members remained concerned about having a regional tariff and the general direction SPP was moving.

“We were evolving as a regional entity, and as we evolved and took on more responsibilities, members were giving up those responsibilities,” Brown said.

“You had this pressure from FERC to give up the competitive advantage that your transmission network afforded you,” he added. “And, so systems were deciding, ‘do I want to turn over control of my transmission assets to a third party to manage on my behalf, or do I want to continue to maintain control but be forced to abide by the rules of Order 888?’”

Political and economic forces attempted to force Associated Electric Cooperative into joining an RTO, but they resisted, Jura said in “Win-Win: An Informal History of Associated Electric Cooperative Inc.”

“It occurred in the days when Enron was very active,” Jura said. “Enron had placed very competent people on these boards, but the whole emphasis was to change the policy of Southwest Power Pool to become more commercial.”

The Board of Directors voted on the issue at its October 2, 1997, meeting. The SPP bylaws required a 75 percent approval rating — 13 of the 17 board votes. Entergy, whose operating companies held three seats on the board, and Associated Electric Cooperatives voted against the proposal, so the regional tariff passed by the narrowest of margins.

Everything seemed to be moving forward for SPP — until October 31, 1997.

Philip Bruich recalled the scariest Halloween in SPP history: “The company had experienced a surge of growth from 14 employees to over 30 that year, as it established its first security center and was headed toward implementing a regional tariff. The ‘Shock Heard Round the Pool’ suddenly occurred as Entergy gave its 60-day notice to withdraw as a member.”
Soon after then-SPP President John Marschewski gave the news to Jura, SPP received a fax from Associated Electric Cooperative also giving its notification to withdraw.

“By the time everyone stopped watching the fax machine that Black Friday afternoon, SPP had lost over 30 percent of its dues-paying membership,” Bruich said.

Brown was philosophical about the event in a 2016 interview.

“There was disagreement, and those that didn’t agree withdrew and dropped out,” Brown said.

At the time, though, SPP was in a major growth phase, and Brown feared the remaining members would not stand up and fund the cost of implementing the growth. But, his concerns were unnecessary. “The rest of the members said ‘absolutely we will,’” Brown said.

“Instead of killing the organization, it really was almost like a slingshot, because in the organizational groups, reaching consensus on the next steps and all the details was a piece of cake,” he added. “The whole organization just really accelerated. So from that which appeared to be a Black Friday — well, we wouldn’t be where we are today but for that event.”

**REGIONAL TRANSMISSION TARIFF**

SPP moved ahead with structuring the regional open-access tariff, which the staff implemented June 1, 1998. It provided nonfirm and short-term firm, point-to-point transmission service across the systems of 14 members. Long-term firm service followed in 1999 and network service in 2001.

Transmission owners soon learned that their concerns about potential revenue loss were unfounded.

“The view going in was the pie is only this big, and if I put my assets in, then so-and-so is going to get a piece of my pie. My piece is going to get smaller, and so-and-so’s piece is going to get bigger,” Brown said. “Well, what happened is — the whole pie got bigger. Wholesale transactions took off. They made out like bandits!”

“The changes offered more trading partners and smoother, single-rate transmission transactions without having to do buy-resales with individual companies,” Ricky Bittle of Arkansas Electric Cooperative Corporation said.

A large part of that growth came from the marketing-company members who bought and sold energy as a commodity.

“...
“There was a lot of money at stake,” Nickell said. “If someone like Enron, for example, could buy power from a utility in the northern part of our footprint and sell it to a utility — let’s say in ERCOT [the Electric Reliability Council of Texas] — they had to go across one of our two DC [direct current] ties to get to ERCOT.

“The DC ties were constrained; there was a limited amount of capacity available on them. So, there was very serious competition to get whatever capacity was available whenever a particular window of opportunity opened. At the time, we would open the hourly transmission service market at noon the day before. Precisely at noon, many marketers had automated systems they would use to submit hundreds of requests for service across the DC tie between SPP and ERCOT. And, if they didn’t get it, they got mad.

“Companies might have an opportunity to buy or generate electricity for a relatively low price and sell it for a much higher price, so there was a lot of money at stake. But they couldn’t make their transaction if they couldn’t get the transmission service. If they couldn’t get the necessary transmission service, the transaction didn’t occur, and they could experience up to hundreds of thousands of dollars per day in lost opportunities.”

Having a FERC-approved regional tariff meant SPP had the basic governing document — the legal document that outlined what SPP would do and how they would charge for it.

“But, the devil’s always in the details,” Nickell said. “And no attorney is going to write every detail that dictates exactly how you execute your day-to-day operations in a FERC-approved document. What we discovered is, it’s a great starting point, but there’s a lot of room for interpretation on the details of how you apply it. We had to figure this out on the fly.”

Nickell remembered overhearing one phone conversation between two customers and his boss, Tom Mallinger.

“They were arguing about the process we had used to respond to the customer’s request, the factors we had considered, and the logic behind our approach,” Nickell said.
“Finally, one of the guys on the other end of the phone got so frustrated with my boss that he said, ‘Tom, I’d be happy if you just told me what the rules were for today.’ They were really frustrated because it seemed to them that the rules changed every day.”

That conversation spurred Nickell to lobby for a detailed manual of business practices for the operators so they could deal with the questions that came up in a consistent manner. He told Mallinger, “We want to help them become independent so when they face these situations, they know how to respond without having to call one of us.”

Trudy Harper remembers the complexity of defining the rules: “The idea of creating a business-practices manual for SPP sounds like a matter of simply capturing the ‘rules of the road’ as they existed, or at a minimum, clarifying details that were covered in a tariff. However, it wasn’t that simple because we didn’t yet have any rules of the road, and the tariffs were very broad with no specifics given about business practices.

“We had a small group of transmission owners and transmission users who met very frequently and wrestled (literally) with issues of business practices that today seem as if they have always been so. We quickly realized that solutions that seemed obvious to the market participants could have significant unintended consequences. I can honestly say, though, that I think that the folks who worked on Business Practices in the early days were doing so with the objective of doing ‘the right thing’ for the end game, and not being self-serving.

“Compared to the opening of a real market with settlement, etc., the development of those early business practices doesn’t seem so hard, but we were working with a clean sheet of paper and writing the foundations of what later became the market. I’m proud to have been part of that process.”

GROWTH SPURT

With the addition of the security center and the rapidly growing staff, the SPP offices quickly became crowded. Fortunately, Executive Director Bill Hulsey had negotiated right-of-first-refusal on open space into the lease when the group first moved to the Plaza West building.

The building management also worked with SPP to accommodate the technical infrastructure needed for the high-tech computers and monitors, telecommunications and air conditioning for the computers.

“We had a small group of transmission owners and transmission users who met very frequently and wrestled (literally) with issues of business practices that today seem as if they have always been so. We quickly realized that solutions that seemed obvious to the market participants could have significant unintended consequences.”
The staff became a tightly knit group with an entrepreneurial spirit that enabled them to do whatever was needed to move the work forward — the beginnings of the corporate culture that drives SPP today.

“It was really hard to keep shoehorning into an original infrastructure that was never constructed with that in mind,” Brown said. “We were constantly growing, so it was ‘let’s shift these people over here and shift these people over there.’ Often we would grow faster than we could acquire space, so a lot of those years I shared an office with any number of people — Carl and I shared an office with two other people for more than a year and a half.”

Malinda See agreed. “There were times I worked in the conference room with six other people sitting around a big table,” she said.

The staff became a tightly knit group with an entrepreneurial spirit that enabled them to do whatever was needed to move the work forward — the beginnings of the corporate culture that drives SPP today.

Everyone on the staff was a jack-of-all-trades with the mindset that if they saw something that needed to be done, they would just take care of it, See said. And everyone pitched in to fill a variety of roles as needed.

“When we got approval to put in our 24-hour center, one of my responsibilities was to build out the office,” Rew said. “So part of that was to get the office space and get the computer room designed.

SPP THEN AND NOW: WE COULDN’T DO THAT TODAY

Longtime staff members have many memories of the early days of working for SPP and the ‘fly by the seat of your pants’ entrepreneurial spirit of the group. Most of those stories end with “We couldn’t do that today,” or “If we did that today, we’d violate so many rules and regulations that it’s pitiful.”

Malinda See remembered a time when she was the backup person for accounts payable, payroll and other financial functions in addition to her engineering duties. “Back before we had a lot of our automated financials, we had a box of blank check stock, and I had the key to it, and my name was the signatory on SPP’s general bank account.

“If somebody needed a check or needed for something to get paid, they would go find me, and I would stop what I was doing, and I would go find the check stock. They would show me the bill. I would hand write out a check and sign it.”

During the early years, making technological changes also was simpler. Someone would ask for a change, and the IT staff would write a piece of code and implement it immediately. Today, the complexity of the system coupled with mandated reliability and security requirements means the process is much more complicated.

“We have to make sure we fully understand your requirements so that what we put into production is what you truly asked for,” Barbara Sugg explained. “We get you to sign off on those requirements. We’re going to make the change. We’re going to test it in our development environments. We’re going to create all the documentation necessary to describe what we changed, why we changed it, who approved the change. And we’re going to show how we tested it, how we’re going to put it into production, what we’re going to do if it doesn’t work once it gets put into production, how we’re going to roll it out, how we’re going to close it out (assuming it’s successful). And all of that is going to be approved before I even put it into production.”
“We used to have small air conditioners up above the ceiling tiles for the computers we had, but that wasn’t going to work, so we ended up getting air conditioners put on the roof and then ran wiring and cooling pipes down to the computer room,” Rew recalled.

Putting everything in place called for some creative solutions. When they installed the backup generator, they had to put the switch gear in a closet in the men’s bathroom.

“When the switch gear was installed, the electrician didn’t torque down one of the bolts properly, and it failed from just normal use,” Rew said. “We had a phase-to-phase fault, which caused a fire in our closet. It happened in the evening while the cleaning lady was in the bathroom because that was the closet where they got their supplies. It sparked. And BOOM! It scared her to death.”
The Power of Relationships
In addition to everything else happening at SPP during this period, the organization moved forward with its plan to seek approval from the Federal Energy Regulatory Commission (FERC) to become an Independent System Operator (ISO). What began as a fairly straightforward plan turned into an almost six-year quest as SPP tried to find the right combination of strategies for success.

**MAPP MERGER ATTEMPT**

First, the board considered merging with the Mid-Continent Area Power Pool (MAPP) — a group that had much in common with SPP. MAPP formed during the 1960s and consisted of a similar makeup of members. It served as one of the eight regional reliability councils for an area running from Canada to Nebraska and Iowa.

MAPP also had experience administering a regional tariff for nonfirm and short-term firm service. The president of MAPP, who was in the process of retiring, discussed the possibility of merging with then-SPP President John Marschewski. The timing seemed right to consider the merger.

The respective executive committees thought the most effective and efficient way to meet member needs and regulatory expectations was to consolidate or jointly provide regional services. Both organizations’ boards approved initiating merger discussions and, in
late September 1997, announced the plan to investigate consolidating or jointly providing some or all of the functions of the two organizations.

The boards directed the combined staffs of the two organizations to develop recommendations by the end of January 1998, and this steering group identified functional areas for possible consolidation, including:

- ISO filing
- Tariff administration
- Engineering
- Information technology
- Operations
- Training
- Policy and administration

In May 1998, the SPP board approved recommendations on consolidation of functions between the MAPP and SPP organizations, but ultimately, MAPP decided not to pursue the merger.

**FERC ORDER 2000**

By 1999, FERC commissioners grew concerned that only five ISOs had been granted approval or conditional approval by the agency. In December of that year, FERC issued Order 2000, which called for the voluntary formation of Regional Transmission Organizations (RTOs). FERC thought RTOs would facilitate the continued development of competitive wholesale power markets and would lead to improvements in reliability and management of the transmission system.

Order 2000 asked all transmission owning utilities, including nonpublic utilities, to voluntarily place their transmission facilities under the control of an appropriate RTO.

Order 2000 required an RTO to have four basic characteristics:

- It must be independent of market participants.
- It must serve an appropriate region of sufficient scope and configuration to permit it to maintain reliability.
- It must have operational authority over all transmission facilities under its control.
- It must have exclusive authority for maintaining the short-term reliability of the grid that it operates.
Additionally, an RTO must perform eight minimum functions:

- **Tariff administration and design** — an RTO must control its own transmission tariff, employ its own pricing system and be the sole provider of transmission service within its control area.
- **Congestion management** — an RTO is required to develop and operate congestion management mechanisms.
- **Parallel path flow** — an RTO must develop procedures to address parallel path flow issues within their area of operation and to coordinate parallel path flow with other regions.
- **Ancillary services** — an RTO must serve as “provider of last resort” for all ancillary services; market participants are given the opportunity to self-supply these services, or acquire them from a third person.
- **OASIS and Total Transmission Capability (TTC) and Available Transmission Capability (ATC)** — the RTO must be the sole OASIS site administrator and must be the sole calculator of TTC and ATC.
- **Market monitoring** — an RTO must establish procedures for objective monitoring of all energy markets it operates or administers to identify market design flaws, market power abuses and opportunities for efficiency improvements.
- **Planning and expansion** — an RTO must be responsible for planning, and for directing or arranging, necessary transmission expansions, additions and upgrades.
- **Interregional coordination** — an RTO is also responsible for ensuring that reliability practices and interconnections are coordinated among regions and that seams issues between regions will be adequately addresses.

RTOs and ISOs have similar (virtually indistinguishable) functions. The primary difference lies in the governance structure. FERC required ISOs to be not-for-profit entities under Order 888, but RTOs could be formed under more flexible governance and business structures.

**ISO/RTO FILING NO. 1**

SPP had prepared to file for ISO status in 1999, and the new RTO status seemed to fit with the services the organizations already provided. The board decided to pursue both designations, and SPP’s first filing requested recognition as an ISO and as an RTO. This filing was submitted December 30, 1999 — just 10 days after FERC issued Order 2000.
FERC rejected SPP’s RTO filing in May 2000. In its order addressing SPP’s filing, FERC concluded SPP had not met the criteria for RTO recognition. Because the SPP ISO filing was made after the issuance of Order 2000, FERC would not consider the filing against its previous ISO standards since they considered the ISO standards to have been superseded by the RTO standards.

MISO MERGER ATTEMPT NO. 1

SPP also investigated alternatives for achieving ISO status. FERC had approved the creation of a Midwest ISO (MISO), and that entity existed largely on paper at the time. The SPP board and several of its members expressed interest in merging the organization with the new ISO.

Nick Brown approached Matt Cordero, the CEO of MISO. During a month-and-a-half of discussions, he thought the meetings didn’t go well.

“There was no recognition at all that SPP had been around for more than 50 years, had a stable membership, operational background and experience,” Brown said. He told the board if the merger was going to happen, SPP would have to concede everything to MISO. The board voted unanimously to cease discussions.

On February 14, 2000, the board decided SPP would “aggressively pursue FERC recognition as an RTO without MISO consolidation.”

BOARD OF DIRECTORS REORGANIZATION

SPP operated with a 17-person board made up exclusively of stakeholders — primarily CEOs of member organizations.

Although FERC’s requirements for an RTO didn’t specifically call for independent governance — only that the RTO be free from undue influence from members and able to maintain independence — SPP considered creating a fully independent board.

After much debate, the group decided to create a hybrid Board of Directors with 14 stakeholders and seven independently elected members — subject matter experts who weren’t in the electric utility industry but who could bring expertise to the group.

SPP modified its bylaws to require that nonstakeholder directors be independent — persons who are not officers, employees or directors of an entity that would reasonably be perceived as having a direct financial interest in the outcome of board decisions.
The nominating task force looked for candidates with qualifications in finance, accounting, law and regulation, commercial markets and trading and associated risk management as well as business management/strategic planning skills or experience in industry restructuring.

After working with Russell Reynolds Associates, an executive recruiting firm, the task force presented its nominees at a special meeting held April 26, 2000, and the membership accepted the nominating committee’s slate of candidates. The new hybrid board met for the first time May 11, 2000, just in time to learn FERC’s decision on SPP’s RTO status.

RTO FILING NO. 2

SPP decided to refile just for RTO status and formed a working group to address the deficiencies cited in the commission’s order.

Entergy approached SPP with a proposal to file for RTO status using a conceptual model the company had developed. The model called for SPP to create an appendix to its membership agreement that would allow an independent transmission company (Transco) to operate under the oversight of the RTO. If approved, Entergy would join SPP as a Transco.

Entergy had presented this theoretical model at workshops FERC sponsored to facilitate formation and breadth of RTOs and had fine-tuned its proposal based on feedback from the workshops.

The SPP board supported the proposal and authorized forming technical and policy teams to develop specific details by mid-summer using Entergy’s proposal as a working document.

“We’re very excited about expanding our current coordination efforts with Entergy to provide one-stop shopping for transmission service and security coordination over a significantly larger area,” then-SPP Board Chairman Gary Voigt from the Arkansas Electric

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**SPP’S FIRST INDEPENDENT BOARD MEMBERS**

James E. Eckelberger — retired Rear Admiral, U.S. Navy, and Vice President, Global Integrated Logistic Operations Supply Chain Management for Compaq Computer Corporation

Quentin Jackson — President and Chief Executive Officer of Nuclear Electric Insurance Limited

Tom J. McDaniel — Vice Chairman of Kerr-McGee Corporation

John E. Oxendine — Chief Executive Officer of Blackstone Communications, Inc.

Harry I. Skilton — former President and CEO of American Meter Company

Larry M. Sur — President, Schneider Logistics

John Marschewski — President, Southwest Power Pool

This group joined seven directors representing transmission owners and seven directors representing transmission users that had been elected in November 1999.
Cooperative Corporation said, “The partnership model enhances the expandability opportunities of the RTO over time as surrounding transmission owners evaluate their options for complying with FERC Order 2000.”

The board approved a memorandum of understanding for the Transco in July and made its second filing for RTO status October 13, 2000.

“Entergy believes the Partnership RTO Model offers the opportunity to develop a truly regional transmission organization that meets FERC Order 2000 requirements while laying the foundation for the continued growth of the RTO by providing transmission owners with the choice of an ISO or Transco within the same RTO,” Frank Gallaher from Entergy said. “We found the workshops hosted by the FERC to be very productive, and we are confident that the Commission will give flexibility to and support the industry in designing regional organizations.”

Unfortunately, FERC didn’t agree. On March 28, 2001, FERC declined to grant RTO status to SPP and referred to the proposal as “a work in progress” that ultimately fell short of the standards prescribed in Order 2000.

SPP submitted further evidence addressing the scope and configuration requirements on May 25, 2001, but FERC rejected the proposal again on July 12, 2001. The Commission reiterated its scope and configuration concerns, stating it “favored the development of one RTO for the Northeast, one RTO for the Midwest, one RTO for the Southeast and one RTO for the West.”

While crediting SPP’s and Entergy’s efforts to form a large RTO, the Commission observed SPP and Entergy may not share “the same natural market” and that “it may be that SPP and Entergy should move in different directions, with Entergy becoming a part of the RTO forming in the Southeast, and SPP joining with others to form a region-wide RTO in the Midwest.”

At the July 2001 Board of Directors meeting, Brown reported in addition to rejecting the RTO proposal, FERC had issued a second order for SPP to begin mandatory mediation with the goal of establishing a single Southeastern RTO.

SPP considered appealing the decision, which would have required seeking a rehearing from the Commission before taking the issue to court, but the members ultimately decided not to pursue that course of action.
After deliberating on how to proceed, the board approved exploring two options for forming a super-regional RTO simultaneously: FERC’s Southeast mediation process and approaching MISO about creating a new entity in the Midwest.

**SOUTHEAST OR MIDWEST?**

Brown and Marschewski took a divide-and-conquer approach to the task at hand with Marschewski leading the merger discussions with the Midwest ISO and Brown leading the effort at the Southeast mediation.

Brown, Pat Bourne and Mel Perkins represented SPP at the mediation process, which lasted for 45 days. Each week, they flew to Washington, D.C., on Sunday, sat in the mediation meetings all week and flew home Friday afternoon.

The Southeast mediation process was chaotic with more than 200 people in the hearings. “The room was just packed; it was just shoulder-to-shoulder in there,” Perkins said.

Four different organizations made proposals, and the group discussed the pros and cons of each model. When the presiding judge called for the vote, the SPP model proved to be very popular, but the judge ultimately took SPP’s proposal off the table for reasons unknown.

“It seemed like SPP was getting the majority of the votes in that meeting, and it wasn’t really turning out like the judge thought it would turn out,” Perkins said.

In the end, the mediation came to no consensus, and the participants went home.

In the meantime, Marschewski was having better luck with the Midwest ISO. Matt Cordero had left the organization in 2000, and Marschewski worked with Jim Torgerson, the new CEO, who seemed open to the idea of combining the two organizations.

**MISO MERGER: ATTEMPT NO. 2**

During the next 18 months, SPP and MISO staff members worked on a plan to create the new RTO.

In October 2001, the Fort Smith *Times Record* reported on the merger.

“The decision to consolidate the two operations was spurred in part by an order of the Federal Energy Regulatory Commission issued in July for the creation of four regional transmission organizations,” according to the Times Record. “FERC Chairman Pat Wood gave
utilities until Dec. 15 to join an RTO, located in the Northeast, Southeast, Midwest and West. Utilities not belonging to an RTO after that date will not be allowed to sell power in wholesale markets. A name for the new organization will be determined by a contest involving submissions from SPP and MISO employees.”

As the plans progressed, SPP staff quickly understood that making the merger work meant conceding that MISO would be the dominant partner.

“The boards would be combined, but their board would stay intact, and four of our board members would move into the new organization,” Brown said. “In this particular case, there had to be a surviving entity — and it was going to be the Midwest ISO. Even though we had existed since 1941, they were going to be the surviving entity, which meant that all of our members would have to terminate their membership agreements in SPP and sign a new membership agreement, which, in essence, was the Midwest ISO membership agreement.”

Other SPP staff members recall feeling something wasn’t right about the merger. “It was just a clash of cultures,” Bourne said.

“There were a couple of things we noticed early on,” Carl Monroe said. “If you go into an SPP meeting, the room’s set up so that all the members sit around the table so that they can discuss items. When we went into MISO meetings, they had it set up so that all the MISO staff people were sitting at the front and the members were facing them.

“And, that just seemed weird to us. How are the members all going to work together to do something if they’re all facing us? They don’t have to convince me to do something; they have to convince each other to do something. We were really saying, ‘We can tell you what we think, but it’s really up to you all on what to do.’ And so, we could tell from even something that simple that there was a different way that they worked with the members.”

But, staff pushed forward with the plan.

“We reached definitive agreements in principle, even to the point that Jim Torgerson would ultimately be the CEO of the organization, and I would be the chief operating officer of the organization,” Brown said. “We’d worked through what the staff structure would look like, all kinds of things.

“We debated for months on the tariff provisions and pricing. We just kept going and going and going. For a period of about four months, I reported to Jim. I mean, we were that combined. And then it came time to effectuate the merger.
“I had informed the staff that I was going to accept the offer and begin functioning within the Midwest ISO to bring about the merger. Then I had the task of contacting each of our members about signing the new agreements. And, everybody I called said, ‘We are just not going to do it. We are not going to subject ourselves to that form of governance.’”

Brown was stunned. SPP called a special meeting of the board to discuss the issue, and on March 12, 2003, the board approved a resolution directing John Marschewski to pursue mutual termination of the Purchase and Assumption Agreement the organizations had signed March 4, 2002.

In retrospect, Carl Monroe noticed a key point about the basic structure of the two organizations. “We’re a 501(c)(6). They’re a 501 (c)(4). And, a 501(c)(6) says that we’re member-owned and member-driven, in essence,” Monroe said.

“They are ‘for the common good,’ so who’s the arbitrator of the common good itself? Even the way you register with the IRS kind of tells something about you as an organization.”

REGROUPING

“On paper, that merger made good sense,” Brown said. “It fell apart because of a very big cultural difference. Now, the members really had to consider from a strategic point of view what they wanted SPP to be.”

The SPP Board of Directors recognized the need for the organization to refocus its strategy, to set a course to create and find opportunities and to create a visible and positive strategic plan. The board formed the Strategic Planning Task Force (now Strategic Planning Committee) to review the SPP organization considering the current industry environment and to make appropriate recommendations.

The Strategic Planning Task Force met for three-and-a-half days at Gaston’s White River Resort in Lakeview, Arkansas, analyzing the SPP organization and answering some tough questions.

“The first question I asked them was to identify what it was they valued in this organization that made each of them decide that they were not going to allow the merger to occur,” said Brown, who facilitated the meeting.
By and large, the answer came down to MISO’s approach to governance.

“Their approach to governance — their approach to how you do what you do — was very, very different,” Brown said. “We were hugely member-driven.”

Jim Eckelberger, chairman of the SPP board agreed.

“I think from the members’ point of view the most important thing is the idea that the organization is member driven,” Eckelberger said. “They relish the opportunity to participate and to be decision-makers and to drive the organization.”

The group considered multiple possibilities for the future, including:

- Dissolving SPP and letting members go wherever they wanted to
- Continuing to seek RTO status independent of MISO
- Approaching MISO again to see if they would budge on their positions
- Continuing to do what they were currently doing (functioning as a regional security coordinator and administering the regional tariff) without seeking RTO status

“Several of our members really wanted to be in a regional organization for marketing reasons,” Brown added. “It was just aligned with their business needs. They had potential mergers in which FERC would require that they meet certain market power mitigation. If you’re in a regional organization, you’re over that threshold. A lot of our members said they don’t care one way or the other; we can just continue being SPP as SPP has been.”

By the end of the retreat, the group concluded SPP should continue to do what they had been doing but also continue to seek RTO status.

Over the course of the year, the group met 19 times to craft a set of recommendations for the board. During this process, the group identified a set of value propositions — qualitative attributes that set SPP apart from other organizations:

- Member-driven
- Relationship-based
- Evolutionary vs. revolutionary
- Reliability and economics are inseparable
- Independence through diversity

Brown summed up the last point this way: “We maintain our independence by putting everyone around the table and resolving issues through a collaborative process — a relationship-based process, and a member-driven process — we’re independent of undue
influence because we put everybody at the table and encourage them to come to consensus on what’s in their collective best interest. That’s very different than any other ISO/RTO out there.”

**RTO FILING NO. 3: THIRD TIME IS THE CHARM**

In August 2003, the SPP board approved a third attempt at seeking RTO status, and SPP made its filing October 15 of that year.

In this filing, SPP used the experience gained from previous filings and advice from various regulatory bodies to craft its plan. This filing contained organizational and operational structural changes to comply with all regulatory compliance directives. The changes included a proposal for:

- An independent Board of Directors
- Development of a pro forma seams agreement
- A Membership Agreement under which all member transmission owners ceded functional control to SPP and under which SPP outlined its responsibility to continue reliability coordination and maintain reliability standards
- SPP continuing to have sole authority to accept or deny transmission requests and review and approve requests for interconnections
- Phased implementation of congestion management including development of an energy imbalance service market
- Continuing to address parallel path flows within SPP and coordinate with other regions on any seams issues
- Providing all ancillary services required to be offered by FERC
- Continuing to administer an OASIS for the region
- Setting up an independent market monitor and update the monitoring plan as markets develop
- Continuing to be responsible for regional planning

SPP received conditional approval from FERC on February 10, 2004, and achieved full RTO status on October 4, 2004.
In a separate order, the Commission addressed rehearing requests on its February order (RT04-1-001). For the most part, the Commission denied the requests, finding that, among other things, the Commission properly required FERC's approval prior to withdrawal of SPP members and properly required SPP to file a seams agreement with the Midwest ISO. In addition, the Commission found that it properly required SPP to make all wholesale grandfathered and retail bundled load subject to the non-rate terms and conditions of its Open Access Transmission Tariff (OATT). The Commission also noted that in the February order, the Commission fully supported the creation of a Regional Service Committee (RSC). The RSC is designed to give a voice to state regulators, the Commission said. The RSC will benefit SPP and market participants by having a partnership between FERC and the state commissions, through which regional issues can be addressed.

SPP, a regional reliability council since 1968, has 48 members, including a broad range of participants from investor-owned utilities, a federal power marketing agency, independent power producers and power marketers. SPP serves customers in all, or parts of, Arkansas, Kansas Louisiana, Mississippi, Missouri, New Mexico, Oklahoma and Texas.

R-04-46

(more)

Congratulations to a great team!

Pat Wood III
Southwest Power Pool went through seven years of exploring merger opportunities, trying to attain Independent System Operator (ISO) or Regional Transmission Organization (RTO) status. But, during that period, the organization also had to focus on its day-to-day business, stay on top of and respond to changes in the market and make internal structural changes to strengthen its RTO applications.

During this period staff grew to more than 100 people, and the infrastructure of the organization became more diversified with that growth. Stacy Duckett joined SPP in 2000 in the midst of the chaotic days of merger considerations and Federal Energy Regulatory Commission (FERC) filings. Then-Senior Vice President and Corporate Secretary Nick Brown knew Duckett through church and wanted to add the former TCBY attorney to the SPP staff. He had one major obstacle — then-President of SPP John Marschewski.

“John just did not have much use for attorneys,” Brown said with a laugh.

But Brown knew he needed someone with a legal mind to help SPP navigate through the complexities at hand, so he hired Duckett as a project coordinator.

“She managed our communications department and other things,” Brown said. “And I’d say, ‘Oh, by the way, can you look at this [legal document]?’”

SPP Vice President of Operations Bruce Rew agreed about Duckett’s value to the organization, especially during the RTO process.
Initially, our members were pretty reluctant to have us be out there in front because it was an area that they managed and controlled because it affected their rates,” Rew said. “So, we had to gain their confidence in transitioning to where we were going to take the leadership role. With people like Pat Bourne (who had a lot of experience in that area) and Stacy Duckett (who was great with relations), we were able to get through both the technical side and the relationship side to build their confidence and move forward successfully.”

Duckett became director of corporate affairs in April 2003 and served as vice president, general counsel and corporate secretary before being named vice president and chief compliance officer in 2008.

RETAIL OPEN ACCESS

At the same time, the wholesale market was undergoing dramatic change, a growing number of states began to examine competitive markets for the retail supply of electric power. The federal government focused its efforts on increasing wholesale competition while leaving the decision to pursue retail competition to the individual states.

Retail competition seemed attractive because competition had dropped wholesale prices to levels significantly below the regulated retail prices. By the end of 1997, seven states (California, Nevada, Montana, Oklahoma, Pennsylvania, New Hampshire and Maine) had enacted restructuring legislation. Five states had comprehensive regulatory orders issued, and more than half of the states either had legislation/orders pending or were investigating deregulation.

The states required utilities to make structural changes to eliminate potential competitive advantages:

- Some required utilities to divest themselves of their generation assets and become wires-only transmission and distribution utilities.
- Some required utilities to divest utility owned generation to unaffiliated nonregulated entities.
- Some allowed utilities to create affiliated generation subsidiaries.
- Some allowed utilities to create operational and management separation (i.e., functional separation) from the utilities’ transmission and/or distribution functions.

“FERC put into the rules that the transmission side of your business and market side of your business can’t talk — you’ve got to build a wall — because you don’t want the marketing...
In December 1995, the California Public Service Commission voted to open the state’s electricity industry to competition as part of a nationwide trend toward creating retail open access.

When the California legislature approved Assembly Bill 1890 in 1996, California became the first state in the nation to deregulate electricity at the retail level. In addition to requiring the state’s utilities to transfer operational control of transmission to an ISO, the legislation created the California Power Exchange, a private, nonprofit organization to set prices at auction.

Initially, the deregulation proved successful with low wholesale prices and steady rates to consumers. However, an unexpectedly hot summer and wholesale market manipulation caused costs to rise rapidly, which temporarily crippled California’s electricity production and led to setbacks for retail open access plans across the country.

As a result of the unseasonably hot conditions and overtaxed production facilities, prices skyrocketed during the spring and summer 2000. The investor-owned utilities were forced to pay the higher prices but could not pass on those costs to consumers because rates to consumers had been frozen as part of the deregulation rules.

The California Public Utilities Commission released a report August 2, 2000, on the problems associated with the deregulation that prompted former California Gov. Gray Davis to call for an investigation into price manipulation in the wholesale electricity market.

By December 2000, the wholesale price of electricity rose to more than $1,400 per megawatt — compared to the average price of $45 per megawatt just one year earlier. Power shortages resulted in rolling blackouts in 2001 and thrust California into a state of emergency as the electricity crisis escalated.

Subsequent investigations by the Federal Energy Regulatory Commission found energy trading companies had manipulated the market by restricting supply to the point that spikes in power usage artificially caused blackouts. FERC concluded “the electric market structure and market rules for wholesale sales of electric energy in California are seriously flawed” and these structures led to unjust and unreasonable rates.
Some companies also questioned the value of retaining their transmission assets under the new rules. Many chose to spin off the transmission side of the businesses into separate companies, which led to the formation of independent transmission companies.

Because FERC forced the severing of that communication, the individual companies had to decide ‘Well, do I want to operate all three forms of my business, or would it be better to spin off my generation units and let them sell at market-based rates?’” he added.

Some companies also questioned the value of retaining their transmission assets under the new rules. Many chose to spin off the transmission side of the businesses into separate companies, which led to the formation of independent transmission companies.

“Three of the states that we were involved in — Arkansas, Texas and Oklahoma — had passed laws that said we were going to give the customers [retail choice],” SPP Executive Vice President and Chief Operating Officer Carl Monroe said. “And the utilities, at the time, believed that they needed a wholesale energy market to make all that work. We originally started on wholesale energy [market] development about 1998-1999 timeframe.”

California implemented the nation’s first retail open-access market in 1998 when the state established the California Power Exchange. California’s plan required utilities to purchase electricity in the day-ahead and day-of spot market, which allowed consumers to see the daily rates for purchased power.

Because the utilities could not enter into long-term bilateral contracts for generation, they were vulnerable of a vertically integrated utility having an advantage of information about the transmission network that other market participants don’t have,” Brown said.

“Enron became synonymous with corporate corruption during the early 2000s as the company’s business practices and creative accounting practices came to light.

The once–thriving company went bankrupt in 2001, and investigations led to jail time for the company’s top management.

“They were huge in pushing for open access and wholesale competition, big on pushing retail competition, and then being the most aggressive player in those markets, regardless of what the rules were,” Brown said.

The Los Angeles Times reported Enron profited by playing the California Power Exchange’s day-ahead market and the California Independent System Operator’s real-time market (which was an imbalance market) off of each other.

The Federal Energy Regulatory Commission (FERC) investigators found Enron documents describing the company’s “Death Star strategy” in which Enron traders were creating and then relieving phantom congestion on the state’s power grid.

And, The New York Times reported what investigators described as “megawatt laundering,” in which Enron bought power in California (at lower, capped prices), resold the power out of the state and then bought it back to resell to California at huge markups.

“Enron brought a dirty name to wholesale competition, and that’s unfortunate,” Brown said. “In any market, there are going to be bad players but that’s why you have market monitoring units. That’s why you have federal regulators and why you have prosecutors — to the extent that it gets that bad.”
nerable to wide fluctuations in pricing — some resulting from natural causes and some from manipulation of the markets by energy traders.

“We were pretty well along with trying to get something in place when the California prices happened,” Monroe said. “There were some flaws in the way they designed the market that caused issues — big, massive money issues, and they eventually melted down. Some of these states that had seen that said, ‘Well if that’s retail access, we don’t want anything to do with that.’”

As a result of the California energy crisis, states in the SPP region repealed their newly enacted retail choice laws.

“The rules themselves allowed parties to take advantage of the market,” Monroe added. “We learned a lot from the meltdown of the market and the design and understanding how you’ve got to make sure the rules provide the incentives to do the right thing as opposed to the wrong thing. The meltdown of California and the meltdown of Enron really caused a lot of these marketing entities not to be able to sustain their business. The independent marketer and the independent power producer kind of waned there for a little bit.”

**STANDARD MARKET DESIGN (2002)**

Partially in response to concerns stemming from the problems in the California market, FERC issued an NOPR (Notice of Proposed Rule) to establish a single, national standard market design. FERC intended for the regulation to “eliminate any remaining discrimination in the provision of transmission service, eliminate other barriers to effective wholesale competition, relieve congestion management problems and curb market abuses.”

State regulators objected to provisions they thought would usurp their authority over rates and provision of service for retail electricity sales.

“Electricity always takes the path of least resistance. Regulation of electricity markets never does,” reporter Dan Zehr wrote in the *Arkansas Democrat-Gazette*.

“On July 31, 2002, FERC issued an extensive proposal designed to standardize the nation’s wholesale electricity market,” Zehr added. “It has run into impassioned resistance from many state regulators and legislators, who worry that the rules will only benefit parts of the country.

“But the debate over pricing methods only scrapes the surface of a proposal wrapped up in the tidy 600+ pages. If adopted in its present form, the standard market design rules..."
Reliability issues came to the national forefront again after North America’s largest power outage occurred August 14, 2003. On that day, 45 million people in eight U.S. states and 10 million people in Canada lost power just before 4:10 p.m. Eastern Standard Time. Some areas remained without power for two days as the utilities fixed the system. By the time the electricity was restored, the estimated economic impact of the blackout was $10 billion.

The problem started when a disabled alarm left operators for FirstEnergy Corporation in Ohio unaware of the need to redistribute power after overloaded transmission lines hit unpruned foliage. What might have been a manageable, local problem cascaded into widespread distress on the electric grid.

The U.S.-Canada Power System Outage Task Force later determined a series of human and operational failures set the blackout in motion. In the official report, the group stated the blackout began after an analyst worked on a separate problem on the grid.

According to the report, “… to troubleshoot this problem the analyst had turned off the automatic trigger that runs the state estimator [SE] every five minutes. After fixing the problem he forgot to re-enable it, so although he had successfully run the SE and [Real Time Contingency Analysis] manually to reach a set of correct system analyses, the tools were not returned to normal automatic operation. Thinking the system had been successfully restored, the analyst went to lunch.”

When the initial line overheated, it sagged, hit a tree and failed. The load shifted to other lines, and the grid in Ohio got less and less stable with too much current flowing over...
too few lines. Power plants began to shut down, and the resulting blackout spread all the way to New York and into Ontario, Canada.

In the wake of the blackout, then-Secretary of Energy Bill Richardson said, “We’ve got a real crisis in our grid, and this is why — despite being a superpower — we have a grid that is comparable to a third-world country. And that’s not right.”

The event also heightened concern that the grid was vulnerable to terrorist attacks. Later, former Secretary of Defense Leon Panetta likened the potential impact of such events to a cyber Pearl Harbor.

After its three-month investigation, the U.S.-Canada Power System Outage Task Force made a set of 46 recommendations to reduce the risk of similar blackouts. Making industry reliability standards mandatory and legally enforceable topped the list.

When Congress passed the Energy Policy Act of 2005, it included policy that expanded the role of the Federal Energy Regulatory Commission. Under the plan, FERC solicited, approved and began to enforce new reliability standards from the North American Electricity Reliability Corporation (NERC). The standards included the three Ts — trees, training and tools:

- Standard FAC-00 — made keeping trees clear of transmission lines mandatory
- Standard PER-003 — required operating personnel to have at least the minimum training needed to recognize and deal with critical events in the grid
- Standard TOP-002-1 — required grid operating systems to be able to survive a power-line fault or any other single failure, no matter how severe.

CONSPIRACY THEORIES

After the 2003 blackout, many theories circulated as to the true cause of the outage and who was to blame, including:

China’s People’s Liberation Army — this group allegedly hacked the computers that controlled the U.S. power grid to trigger the cascading blackout.

Extra Terrestrial — a “spherical shaped, self-luminous UFO” allegedly was caught on film by Fox News helicopter camera while filming the Queensboro Bridge in New York City.

U.S. Government — a secret HAARP (High-frequency Active Auroral Research Project) allegedly triggered the blackout when it was turned on just after 4 p.m. Eastern Standard Time. HAARP was a research program to analyze the ionosphere and investigate the potential for developing ionospheric enhancement technology for radio communications and surveillance.

al-Qaida — allegedly, the same vendor that consulted with FirstEnergy on SCADA (Supervisory Control and Data Acquisitions devices that send and receive information over the Internet or via radio links) did similar work for the Egyptian Electricity Authority. Operatives for al-Qaida were able to study these devices and used them to cause the blackout.
With its newfound authority, FERC could impose fines of up to a million dollars a day for an infraction.

Power companies responded accordingly. A study conducted for the Associated Press in 2013 reported utilities spent an average of $21,514 per year on devices and station equipment per mile of transmission line from 2003 to 2012 — almost three times what they spent from 1994 to 2003. Maintenance spending for overhead lines increased by an average of 8.2 percent per year from 2003 to 2012 compared with just 3 percent a year on average from 1994 to 2003.

LEADERSHIP TRANSITIONS (2003)


During his 38 years in the electric utility industry, Marschewski watched the industry go through periods of significant change, and he saw SPP grow from a staff of five to more than 115 employees.

When asked what he thought the biggest value SPP provided to the membership over the years, Marschewski responded, “It has to do with recognizing the gift of electricity. It is something so important — especially today. All that we do, have done and will continue doing helps lift people up with something so important to everybody. And, we are doing it together.”

The board of directors selected Nick Brown to succeed Marschewski on November 17, 2003, and Brown assumed his new duties at the beginning of 2004.

“My first impressions of Nick were how much he cared about everything we did and how much he had an immense knowledge of why we were doing it,” Chairman of the Board of Directors Jim Eckelberger said. “Certainly, the culture that SPP has today is a total reflection of Nick.”

LACYGNE-STILWELL PROJECT (2003)

Market transactions continued to grow, and SPP members began to look for solutions to their shared concerns about congestion. The time had come for looking at the region as a whole instead of discrete markets.
“In terms of transmission expansion, the incumbent transmission owners really were the ones responsible for both planning and building new transmission facilities in SPP until about 2004,” SPP Vice President, Engineering Lanny Nickell said.

“[The transmission owner] would have to build something really big, and his customers would have to pay for it,” Carl Monroe added. “But then, anyone who used the line after him would, in essence, get it for free. It didn’t seem reasonable because they weren’t sharing the cost of transmission.

“One of the things we took on was trying to find a solution. There was one limitation on the transmission system south of Kansas City that was really restricting us from selling service anywhere. And, nobody wanted to upgrade it because it was really expensive to upgrade it. So no one customer would take it on.”

According to SPP’s 2002 Annual Report, “The most significant curtailments occurred on the LaCygne-Stilwell 345-kV line due to heavy south-to-north energy flows resulting from unusually hot temperatures in the Mid-Continent Area Power Pool (MAPP) and Mid-American Interconnected Network, Inc. (MAIN) regions, and this facility’s susceptibility to being impacted by parallel flows.”

Kansas City Power and Light (KCP&L) had investigated options for upgrading the line, including taking the line out of service to rebuild it with larger conductor or building a parallel line. Neither option proved to be a workable solution.

After surveying the line more extensively, KCP&L developed a plan to upgrade the existing line using new technology — a high-temperature conductor known as Aluminum Conductor Steel Supported (ACSS). The ACSS could carry almost twice the load of the original material. Also, the ACSS would allow for the line to be upgraded while “hot” (energized) resulting in minimal disruption to the transmission market.

With the logistics for doing the project worked out, KCP&L still had to fund the upgrade.

SPP MEMORIES: JOHN MARSCHEWSKI

“He always had a positive attitude,” Bruce Rew said. “One thing that stood out was his laugh. When he laughed everybody heard it in the small office we had.”

Malinda See remembered how Marschewski taught her the value of relationships. “In the early days, John showed me a list on paper of all the SPP members. He told me. ‘You don’t have one boss; you work for everyone on this list.’”

“John’s whole focus was collaboration,” Nick Brown said. “He very much was a people person. John was just tremendous at bringing people together and ironing out thorny issues and collaboration was the whole benchmark of his career.”

Carl Monroe agreed: “He understood that the benefit of the organization was the collaboration.”
SPP announced the creation of the John Marschewski Leadership Award in 2003, saying: “As president of SPP, Marschewski cared deeply for people and held that people are SPP’s most important asset — a value that continues to be the foundation of the organization.”

JOHN MARSCHEWSKI LEADERSHIP AWARD

Carlos Ordaz (right) received the first John Marschewski Leadership Award from John Marschewski and Nick Brown.

SPP announced the creation of the John Marschewski Leadership Award in 2003, saying: “As president of SPP, Marschewski cared deeply for people and held that people are SPP’s most important asset — a value that continues to be the foundation of the organization.

“His leadership focus was based upon collaboration, human development and earnest concern for electric system reliability.

“The John Marschewski Leadership Award will be presented annually to an employee nominated by management and selected by SPP officers, who has displayed a continuation of Marschewski’s legacy of ideals that are paramount to the success of SPP.

“Recipients will not only be hard-working, but also maintain a positive, encouraging attitude toward customers and co-workers, and understand and portray that relationships and positive attitude are very important in achieving goals, both personal and corporate.”
“Bruce Rew, working with our transmission owners, came up with a way to do the project,” Monroe said. “They agreed that the transmission provider who owned the facilities that needed to be upgraded would upgrade the facilities, and the other transmission owners would give up their revenue from transactions on any new service that we sold. The revenue went to Kansas City Power and Light who built the facility up until the time it was paid for.”

“We designed a cost-sharing for future transmission service that was approved,” Bruce Rew explained. “Instead of the revenue going to SPP and being spread out like it normally would, Kansas City Power and Light upgraded its facility, so they got paid until they fully recovered their cost for that.

“It opened up the transmission services for us; we were able to sell a lot more power and a lot more transmission service,” Rew added. “It was about a $6 million project, and we paid them back in less than two years just from new transmission service.”

Reconductoring the line while it was still live meant the crews had to implement extra safety precautions as they worked on the project in sections. Rew explained the 32-mile transmission line had three phases. KCP&L built a fourth, temporary phase and upgraded the system one phase at a time.

“They would take one phase out of service and put it into the temporary and then go through and string a new conductor in that phase. Once they got the new conductor in place, they’d switch it. It’s a high-voltage line, so there’s a lot of risk when you do that,” Rew explained.

The project finished a month ahead of schedule.

“[It] was a major accomplishment considering the team endured hostile weather from the start of February with frozen ground, snow, mud, copious spring rains and May tornados,” Paul Beaulieu of KCP&L said.

The project embodied the benefits that regional planning and coordination could bring to the general public.

“We had a regional problem that required a regional solution. The benefits of this solution transcend many state boundaries and regions,” Brown said.

KCP&L was able to recover its costs within 18 months just from the additional transactions.

“So that really got the members thinking on this transmission expansion service side that there are some benefits from sharing the cost of building facilities that would provide...
benefits across more parties,” Monroe added. “We started down that track at the same time we were doing this market development.”

**WIND POWER**

The LaCygne–Stillwell project wasn’t SPP’s only first in 2003. In May of the same year, Blue Canyon Wind Farm became the first wind farm to pass completely through SPP’s Open Access Transmission Tariff generation interconnection process. The procedure, which took two years, involved three types of studies:

- **Feasibility** — to analyze effects on the transmission system
- **System impact** — to analyze transient stability effects on the transmission system and all generators due to specific event outages
- **Facility** — to provide the interconnection customer with detailed cost and construction time estimates and any required system upgrades

Blue Canyon’s plan initially consisted of 45 wind turbines located approximately 15 miles northwest of Lawton in southwest Oklahoma. Positioned on a geological feature known as the Slick Hills, the east-west orientation placed them perpendicular to the prevailing wind direction.

SPP reported these 45 turbines could create 74.24 megawatts — enough to power 22,300 residential houses.

**REGIONAL STATE COMMITTEE (2004)**

“At the time we were looking to become an RTO, there were some bad feelings about the federal arena,” Carl Monroe said. “FERC had said we needed a standard market design, and everybody needed to do this to be in the market. There were states — the state utility commissions — that objected to it because they felt like FERC was stepping into some of the state issues.”

SPP’s members developed a proposed solution: get states involved in the governance process by giving them — by way of their utility commissions — a say in RTO-related matters. Pat Wood, the chair of FERC at the time, similarly supported giving states a set of powers including the authority to develop methods of cost allocation for transmission projects.

In the past, SPP had invited state regulatory agencies to send representatives to the board of directors and engineering committee meetings.
“The commissioners had a long-standing role of interacting with SPP, but there was no formal structure for it,” said Steve Gaw, a Missouri utility commissioner, who served on the first Regional State Committee (RSC).

State utility commissioners watched SPP’s attempts to achieve RTO status with interest, as it was clear the outcome would impact their work, Gaw said. They ultimately determined that their support of SPP as an RTO was important.

“There was a lot of discussion among those of us who were involved with the commissions at that time. When we saw this suggestion from Pat Wood, it sort of became the catalyst for us to say ’look, if we can be a part of making some of these decisions as state commissions that helps us in the transition of whether or not we may be losing some of our perceived jurisdiction.’ So that was the proposal that we came up with.”

Eventually born of these ideas was SPP’s Regional State Committee (RSC) — a group of state-level regulators within the SPP footprint tasked with developing specific initiatives to benefit the region.

SPP incorporated the RSC on April 7, 2004, and the group held its first meeting April 26 with these founding members; who were utility commissioners in their respective states:

- Sandra Hochstetter Byrd (Arkansas)
- Brian Moline (Kansas)
- Steve Gaw (Missouri)
- David King (New Mexico)
- Julie Parsley (Texas)
- Denise Bode (Oklahoma), president
“SPP was one of the first to give a group like the Regional State Committee specific responsibilities; in most of the other regions groups like that are only advisory,” Bruce Rew said. SPP charged the RSC with three specific areas of responsibility:

- Cost allocation
- Capacity margin
- Transmission congestion rights

“My counterparts thought I had lost my mind — turning over such authority to the states,” Brown said.

One of the first issues the new RSC tackled was an order FERC had issued in February 2004 directing SPP to file a transmission cost allocation plan. The RSC developed a new framework using input from SPP's membership and staff.

“I think the states, after they had formed this organization, felt the real sense of responsibility to show that what they had said that they were willing to do, they would indeed work on,” Gaw said.

“We had a lot of discussion among the states about crossing over what was at that time — today it doesn't seem like much — but at that time, it was a huge hurdle of sharing costs for a line that might be built in one state but other states were sharing in that [benefit],” Gaw added.

The early days of the RSC mirrored those of SPP, as they encouraged disparate entities to work together for the common good of the region.

“Texas brought Texas views to the table, and Arkansas brought Arkansas views — and they were often widely different,” said Les Dillahunty, who joined SPP as director of Regulatory Affairs in 2003. “They hadn't had to work together before, and this idea of sharing cost for transmission was widely divergent among the states themselves. We had to work with them, and they worked with themselves to bridge the gap to come to something we could all use. It took a life of its own, and it became something important to SPP that had not been materially important in the past.”

“The commissioners all wanted to solve the problem,” Gaw said. “If we had started out with the idea that we just wanted to stand up for our position, and solving the problem was secondary, nothing would have ever happened. But it broke the dam that had existed for a long time.”
In January 2005 — after more than nine months of effort — SPP filed a joint proposal with the RSC to address cost allocation for transmission upgrades.

The RSC’s roster changed frequently. Every time state commissioners finished their terms in their home states, they likewise left the RSC. A spirit of collaboration was thus critical.

Paul Suskie, who succeeded Sandra Hochstetter Byrd as chair of the Arkansas Public Service Commission and as Arkansas’s representative on the RSC, remembered his transition from being state-focused to being region-focused.

“That was a big jump for me,” Suskie said. “I will never forget asking the question, ‘Why should people in Arkansas pay for transmission in Kansas?’ I turned to the chairman of the Kansas commission and said, ‘just pay for it yourself if you want it so bad.’”

Suskie’s thinking changed as he realized what the RSC was working toward and came to appreciate the nature of the bulk electric system. “Part of it was the evolution of thinking,” he explained. “When a power plant in southwest Arkansas generates electrons, they don’t stay in Arkansas — they flow all over.

“We started thinking regionally and not just about our own states. When you do that you’re able to do good things and proceed on.”

Current RSC members echo this sentiment.

“My experience with the RSC has been that our voice — the voice of the states — is really valued, and that value carries over into the discussions of the various committees in the Southwest Power Pool as well as the board of directors,” said Steve Stoll of the Missouri Public Service Commission, who joined the RSC in 2013.

“We don’t always agree on everything, and we can sometimes be skeptical but the dialog is there that really helps us to understand their point of view and for the staff to understand what we’re thinking,” Stoll added.

“I think the narrow scope of the RSC’s authority and responsibility within the SPP has turned out to be a real benefit to everyone,” Jake Langthorn from Oklahoma Gas and Electric Company said. “They are stakeholders, and they exercise the same stakeholder power as anyone else does. I think they have been a tremendously good influence. Not that the board isn’t interested in some of the same things, but it’s always good to have an independent check, and the RSC is independent.”
RECONFIGURED BOARD OF DIRECTORS (2004)

In addition to establishing the RSC, SPP reconfigured its board of directors. The hybrid structure created in 2000 gave way to a fully independent board.

Under the new configuration, the seven nonstakeholder members became the board of directors, and the members serving as stakeholder directors became the Members Committee.

Brown explained the decision to form the Members Committee: “We decided to go with a completely independent board and keep the 14 stakeholders on as a members committee — they sit with the board, meet with the board and cast non-binding votes on issues so that the board knows where the members are on items that come up for the board’s consideration. Then the board will vote.”

Turning over full control of the organization to a non-stakeholder board required extraordinary trust on the part of the members. Fortunately, the stakeholders had four years’ experience working with independent board members under the hybrid structure, and SPP had worked diligently to help the independent members understand both the incredibly complex nature of the industry and the very simple core commitment of the utilities.

Phyllis Bernard visited several of the member organizations after she joined the board in 2003.

“The men who run these power plants — that’s their child,” she explained. “It’s the linemen. It’s the folks in administration. It’s their board of trustees. They have a covenant with their communities to be there. They have to trust us to care about their people the way they care about their people. And, so it’s incumbent upon us to make sure that they know that we’re at least trying to.”

That kind of trust was a key to SPP’s success and factored largely into one of the things that set SPP apart — its commitment to culture.
Ask any SPP employee about working for the organization, and the word “culture” will likely appear in the answer. Not culture as a theoretical construct about beliefs and concepts, but culture as a practical way of thinking, behaving and working together. The roots of SPP’s culture had existed since its founding members’ first collaborative efforts during the 1940s, but it blossomed after Nick Brown took the helm.

Brown assumed leadership of SPP at the beginning of 2004 — less than six weeks before the Federal Energy Regulatory Commission (FERC) awarded the organization conditional Regional Transmission Organization (RTO) status. Leading the organization through the many changes that occurred during the next 12 months proved to be very challenging.

The pace quickened as the organization made structural changes and worked to achieve full RTO status. SPP continued to grow — adding new staff members, reconfiguring office space and working with members to add and refine services the new RTO would provide to benefit its members and their customers.

“In the really short course of 18 to 24 months, we weren’t just having serious growing pains; we were behind in implementing a large project,” Brown said. “There was a lot of finger-pointing among staff and vendors. We were having issues that nobody seemed to be able to identify.”
The board of directors encouraged Brown to attend the Harvard Advanced Management Program — a 10-week intensive study program in Boston.

“My initial reaction, in all honesty, was ‘You’ve already elected me CEO, and now you want me to go to school?’” Brown said. “Leaving the organization for 10 weeks when we were having all these issues seemed counterintuitive to me.”

Regardless, Brown went to Harvard.

**THE EPIPHANY**

“It was going to Harvard Business School in 2005 when I realized that we had lost our way,” Brown said. “Our customer satisfaction was going down; our error rate was going up. Our employee engagement was low and lowering. Our compliance rate was going down. All indicators were going in the wrong direction. I had just been elected CEO, and I’m thinking, ‘Oh my God. This isn’t good.’”

The intensive study program immersed participants in deep research and reflection.

“The course Nick went to at Harvard is a course where just about everybody is a CEO,” Chairman of the Board of Directors Jim Eckelberger said. “You get immersed day and night, seven days a week, in how people are thinking and how they might be thinking differently than you. It’s a very rich experience on how leadership is demonstrated by people who are incredibly able at being leaders.”

Harvard Business School structured the program so participants interacted closely with the school’s faculty and with other senior executive participants who represented a wide range of companies. The curriculum included lectures, business simulations, case studies and small group discussions.

During the program, Brown examined 110 real-world case studies, analyzing companies’ successes and failures and determining best practices. The group’s ability to dissect these complicated business cases fascinated Brown.

“My one take away from that course at that time was ‘Culture eats strategy for lunch every day,’ Brown said. “Then I changed it to ‘Culture eats strategy for breakfast every day.’ And now, I’ve continued to evolve it to ‘Culture is the ultimate strategy.’ It’s not one versus the other.”
SPP MEMORIES: UP, UP AND AWAY — TO THE HOSPITAL

SPP thought that understanding differences in personality and work style could help improve communication and teamwork.

One of SPP’s annual company-wide training programs introduced the staff to the Keirsey Temperament Sorter personality test as a way to help employees understand that different people bring different viewpoints and approaches to problems.

To illustrate the point that everyone can be a hero if they play to their strengths, several members of the management team dressed up as popular culture heroes:

- Tom Dunn — Superman
- Bruce Rew — Luke Skywalker
- Michael Desselle — Indiana Jones
- Lanny Nickell — Rocky Balboa

The heroes planned to run out on stage to introduce the different types of heroes, and Tom Dunn was the first to go out.

“They play the music — the Superman theme — and Tom comes out on the stage to make his grand entrance,” Lanny Nickell recalled. “His plan was to run across the stage and jump off the stage down onto the floor where everybody was seated.

“He comes running out, and he jumps, and as soon as his foot hit the floor … people say that when he landed, you could just see his face grimace,” Nickell added.

“I limped up the aisle and got to the back,” Dunn said. “I thought it was just an ankle sprain and thought I would just walk it off. I got to the back and thought, ‘this is not good’ so then I limped back down to the front and went back up behind the stage and collapsed.”

“Emily [Pennel] ended up driving him to the hospital,” Nickell said. The doctors told Dunn he had broken the heel on his right foot and bruised the heel on his left foot.

“The picture of me dressed as Superman shows up in presentations all the time — even now,” Dunn said.
Brown returned with a mission to fix the SPP culture. He recognized much of the problem stemmed from the rapid growth in staff from approximately 40 people to more than 100. When the organization was smaller, Brown had participated in most hiring decisions — staying true to his gut feeling that you should hire the person, not the résumé.

“As we grew past 100 [people] — when I had to turn over hiring to a lot of different managers — we lost our way,” Brown said.

Finding candidates to fill an ever-growing list of new positions while simultaneously adapting to the changes necessitated by SPP’s drive toward full RTO status pushed existing staff members to their limits. Brown said he thought he did a poor job of handing off the hiring responsibilities because he didn’t emphasize the importance of the SPP culture enough — what he refers to as “soft skills — how we do what we do.”

“We ended up hiring some people who just didn’t get how to function in an organization like ours — that has to engage a very diverse stakeholder group and seek a lot of input from a lot of people and convince a lot of people that this is the direction that we collectively need to go,” Brown said.

He decided to launch an initiative to document the SPP culture and then to “enforce the heck out of it.”

Documenting the culture meant first defining it — putting the core ideology and culture drivers in place. Brown brought together a diverse group of employees to serve as the task force for the initiative.

The group came back with three culture drivers — efficiency, collaboration and continuous improvement — as well as one core ideology, “Do the right thing, for the right reasons, in the right way.” Brown said, “They really hit the nail on the head!”

He explained: “In operations, we call balls and strikes every day. And those calls make some market participants happy and some not happy at all.”

SPP’s long-term transmission planning functions are similarly fraught with the potential for conflict.

“When we plan for transmission 15 years down the road, when we propose a particular line between point A and point B — there are going to be transmission owners that really like that idea, and there are going to be some that really don’t like that idea.
There are going to be landowners that really like it and landowners that don’t like it for different reasons.”

The key to navigating such circumstances effectively, Brown said, is to balance appropriate action with appropriate motive and method.

“It’s about always focusing on what’s the right thing to do and asking ourselves if our motives are pure. Are we doing it for the right reason, or is there something in the back of my mind that’s making me lean more toward this project over another project?

“And, you can do the right thing, and your motives can be pure as light, but if you run over people or dictate in your implementation or you don’t bring people along with you or help them understand why what you’re doing is the right thing for the right reason, then you can do irreparable damage to the organization.

“So that’s why I think what they put together is just magical for an organization like ours — one that has to operate in real time and call balls and strikes but that at the same time has to think 15 or 20 years down the road and make decisions on the investment of huge amounts of capital, and condemnation of land, and all kinds of things.”

**RECALIBRATING THE CULTURE**

With its culture drivers and core ideology defined, SPP next had to launch its culture initiative more broadly and begin the actual recalibration process.

“We went through the painful process of cleaning up what we had allowed to happen,” Brown said.

Culture became a hot topic as the leadership began to educate staff and reinforce the message. To the credit of all involved in the effort, what could have become a bunch of empty catchphrases instead became a way of life for the employees.

SPP Vice President of Engineering Lanny Nickell laughed as he recalled the effort to revive SPP’s culture: “I remember initially thinking, ‘Is this what we paid Harvard to do for us?’”

But he quickly saw the genuine commitment behind the words.

“The more you heard it, the more you lived it. The more you lived it, the more you realized just how much it shaped how we operate, and it became such a way of life for us that sometimes we didn’t even know that we operated that way,” Nickell added.
Redirecting something as enigmatic and entrenched as a corporate culture is no easy task.

“I think you have to start with the notion you’re going to share with your officer team how we’re going to act differently than how we may have been acting in the past,” said Jim Eckelberger. “There are all sorts of parts to that — from incentives to rewards to just how you treat people on a day-to-day basis.”

“It certainly has to do with leadership, but it also has to do with caring,” Eckelberger added. “And an awful lot of the caring part can be ‘carefrontational.’ It’s about how you go about being confrontational without being nasty.”

Getting everyone moving in the same direction was also key, said Bruce Rew.

“We had to make sure we were all working for the same goal and that we didn’t compete against each other departmentally or have finger pointing,” Rew said. “It was very important for us to continue working together as an organization.”

Part of the process included setting expectations regarding behavior and defining exactly how staff members were to approach their day-to-day work as leaders, regardless of their positions on the organizational chart. Brown said they doubled the

**TALKING THE TALK; WALKING THE WALK**

In a recent survey, SPP employees answered the question, “Who in the company inspires you and why?” Here are just a few of the people they selected:

**Bert Bressers**
- He is honest, has integrity, and the best work ethic I have ever known.
- You know you are not going to win a debate easily with Bert, but he provides the inspiration to come to the discussion prepared with diligent research.
- The only thing that guides him is doing the right thing.

**Nick Brown**
- I have never met a leader so open, engaging, and truly walking the walk as he does.
- His passion for this company, our people, and our culture is relentless.

**Warren Brown**
- He said something that I have carried with me to this day: “If you don’t adapt, you will die.” I recall that often as the marketplace complexity increases at a rapid pace. For me, it meant a lot about continuous improvement and working to find solutions to problems.

**Gary Cate**
- [He] is very knowledgeable and willing to help me understand concepts.

**Stacy Duckett**
- She was determined, ethical, and supportive of our culture.

**Heather High**
- She is intelligent and also a very caring person...You’d think she’s such a softie, but as an auditor, she is also very professional and firm when she needs to be.

**Carl Monroe**
- He has a way of dealing with people that sets him apart from others.
- His willingness to support and engage with staff is truly appreciated.
- He is the calm in the storm that can handle difficult situations, yet keep an even tone and open ear to provide solutions of benefit to the entire group.
number of performance reviews for an initial three-year period and made alignment with the culture part of the evaluation.

“Your expectations are to get people to be self-actualizing,” Eckelberger said. “And if people are self-actualizing, the leader’s job becomes servant-leader — focusing on how you go about taking impediments out of the way of people who are finding it difficult to make their successes happen. That’s the kind of culture everybody enjoys working in, and they get to a point where they contribute very well in that kind of a culture.”

Another key component of the documentation of SPP’s culture was the company’s business model.

“Nick put the emphasis on getting 100 percent of the employees to understand the business model — to actually document it, not just a mission statement, but document the business model; document what it meant to be an employee; document the culture, the ideology, the value drivers and all that, and then ensure that it is repeated, and repeated, and repeated so that people know it, and they know it isn’t just lip service,” SPP Vice President of Information Technology Barbara Sugg said.

“Nick preaches to the staff about 360-degree accountability,” she added.

MORE OF TALKING THE TALK; WALKING THE WALK

Lanny Nickell

• He is a great leader. He leads by example. He is sincere with his feedback. His comments to us all come from his heart.

Terry Oxandale

• [He’s] smart about the business and industry while not making others feel stupid. At the same time, he seems comfortable admitting when he doesn’t know something.

Bruce Rew

• [He] has the most positive attitude at all times.

R. J. Robertson

• He always had time for a quick conversation, punctuated with smiles (and usually laughs), and you always walked away uplifted and ready to do your best.

Don Shipley

• [His] positive and caring attitude inspires me. He is always thinking about the big picture and SPP as a whole (as opposed to just his immediate team);
• I’m continually inspired by his ability to think outside the box and be caring and personable while also being a tough leader and incredibly determined.

Barbara Sugg

• [She] has the greatest determination in everything she does.
• She challenges me to grow, learn, challenge myself, and to help others to do the same.

Danni Wilson

• She always has a positive and helpful attitude. Being the ‘face’ of SPP to visitors (and employees) is a very important job and one she does with grace and humor.

Jodi Woods

• [Her] intelligence, humility, positive attitude, and willingness to help inspires and challenges me to become a stronger employee — one who can make a difference like she does.
“He wants anybody who ever sees anything that they think is counter-cultural or wrong to speak up no matter who is doing the wrong thing — including him. He has been a tremendous advocate for that.”

**ALL ONBOARD**

Hiring continued at a rapid pace.

“We were hiring 100 people a year for three or four years,” Eckelberger said. “When you do that, you have an opportunity to create something very different than what was there. Nick worked very hard on making sure that the people who were in the base acted in a way that was very welcoming to the people who were coming onboard. Part of that process is making sure you bring people onboard in a very healthful way so that they feel included right from the start.”

The company developed an onboarding program that lasted four-to-six months, in which every new employee participated along with other newcomers to SPP. The process involved everything from scavenger hunts to making presentations to executive management.

“When you’re a new hire, you’re put in a group of other similar new hires. We have a very structured program that they go through to learn about the history of SPP, what we do, how we do it,” explained SPP Vice President of Corporate Services Malinda See. “They’re assigned tasks as part of their onboarding that teach them about our culture aside from their actual job-related responsibilities.”

Phyllis Bernard called SPP’s culture initiative “a gigantic achievement.”

“Human resources has done an outstanding job identifying the objective, observable, learnable behaviors that are indicative of the true culture of Southwest Power Pool that transcends gender; transcends sexual orientation; transcends geography; and transcends ethnicity, faith, tradition, and anything else,” she said.

SPP’s culture, though integral to the company’s overall success, is also unique.

“I’m not saying our culture is magical,” said Nick Brown. “If you tried to take our cultural aspect — how we do what we do — and implement it in another ISO/RTOs, it would be an utter failure.

“The expectations, the desires and the history of the development of those organizations are too different than ours. You have to define your culture based on the business you are in.”
Southwest Power Pool had come a long way from the days when its primary function was to produce load-flow models for its members.

Achieving Regional Transmission Organization (RTO) status and establishing the Regional State Committee (RSC) in 2004 laid the foundation on which the Integrated Market would be built a decade later.

SPP also was positioned well nationally as the only entity designated as both a Regional Reliability Council by the North American Electric Reliability Corporation (NERC) and a Regional Transmission Organization by the Federal Energy Regulatory Commission (FERC).

In the 2006 Annual Report, the message from the chairman and president said, “We are evolving from a small, entrepreneurial organization, operating primarily behind the scenes, to a large, going concern inextricably tied to the provision of reliable, marketable electric service. Our goal is to retain the best of both worlds: an enterprise respected for the sophisticated project management, stellar performance and quality control of a large company, with the bias for action and the hunger to learn and improve of a small company.”

The time was right for SPP to embark on several key short- and long-term projects, including:
CONTRACT SERVICES

SPP became one of the first organizations in the industry to offer and provide independent administration of operations for utilities by establishing a Contract Services department. In 2006, FERC conditionally approved a proposal by Louisville Gas and Electric (LG&E) to delegate transmission tariff administration duties to SPP as LG&E’s Independent Transmission Organization (ITO). Under the proposal, SPP would oversee interconnection service, function as LG&E’s scheduling authority and provide system expansion planning functions.

This proposal marked a new direction for the industry. Instead of requiring LG&E to join a full-service Independent System Operator (ISO) or Regional Transmission Organization (RTO), FERC was allowing a utility to farm out pieces of its operations. LG&E planned to have the Tennessee Valley Authority administer its reliability coordination.

SPP likewise contracted with Entergy to serve as its Independent Coordinator of Transmission (ICT), assuming the responsibilities of reliability coordination, tariff administration, available flowgate capability (AFC) calculation, transmission planning and operation of the Open Access Same-Time Information System (OASIS).

MAUMELLE OPERATIONS CENTER

Growth in SPP’s responsibilities led to expanding staff and the need for new technology, all of which required additional physical space.

“We had our operations center on the seventh floor in Plaza West, and we had taken over about a third of the floor with just operations and the computer room,” SPP Vice President of Operations Bruce Rew said. “At that point, the industry was becoming more and more aware of the need for reliable and secure operation centers, and our backup was at Arkansas Electric. We knew it wasn’t going to work for the future.”

On April 25, 2006, SPP held groundbreaking ceremonies for a new, freestanding operations center located in Maumelle, Arkansas.
SPP had the building designed with security in mind. The room in which operators monitored the grid and the data center had no windows, and the entire building was designed to withstand storms and other natural disasters.

The 20,000-square-foot building included a reception area, a full-sized kitchen and a scenic break room.

“We’d spent a couple of years planning and designing it,” SPP Vice President of Engineering Lanny Nickell said. “We were so excited. … [We thought], this is going to be the first building that we own, and we get to design it and build it, and it’s going to be great.”

Rew said in addition to the control room where operators worked in shifts, the building had 25 offices for support staff — engineering and IT people.

“Almost on day one when we moved in, we were already overflowing,” Nickell said. “We had started the planning phase two years before. We didn’t anticipate how much more growth we were going to have, and we were budget constrained.”

The new operations center went live as the primary operations center April 9, 2007, and the grand opening celebration was held June 11 in conjunction with the board of directors conference. The Plaza West operations center became the backup center.
ENERGY IMBALANCE SERVICE (EIS) MARKET

The roots of SPP’s Integrated Market trace back to the 1990s when the organization implemented an online bulletin board on which members could bid to supply and purchase power. SPP played no role in the buying or selling other than providing the forum for members to communicate easily.

In 1999, SPP began exploring wholesale market development opportunities as four of its operating states announced plans to launch retail open-access programs. In February 2000, SPP discussed the development of a common market settlement process and other processes so SPP could support retail open-access.

By late 2001, however, the climate in the electric industry had changed. State public service commissions and legislatures delayed implementation of retail choice laws to analyze further whether their states would benefit in a region already served by relatively low-cost energy. Eventually, the policy concept of retail choice was abandoned across the SPP region with the exception of the Electric Reliability Council of Texas (ERCOT) portion of Texas.

With the abandonment of retail choice policy, SPP focused on the implementation of a balancing energy and operating reserves market known as COSMOS. SPP completed the market design in 2000, then developed, tested and finalized the system in late 2001.

By that point, SPP was negotiating a second merger attempt with the Midcontinent Independent System Operator (MISO). The development of market systems was put on hold until the merger was consummated. When merger plans fell through, SPP used the COSMOS market design as the conceptual starting point for what would become its Energy Imbalance Service (EIS) market.
Energy imbalance was “like a stock market, but the only stock we’re selling is what we call energy imbalance — the difference between what a utility tells you it’s going to do with respect to its generation output and its needs in order to serve demand and what actually happens,” Lanny Nickell said.

Members estimated their energy usage and submitted a schedule of when they were going to operate which generator. When differences occurred between the schedule and actual energy delivered, the market participant purchased service from other market participants.

In the EIS market, prices were calculated every five minutes and averaged to hourly settlement prices. Prices reflected the incremental cost of delivering energy to specific locations on the spot.

SPP deliberately chose to create just one component of what would eventually become the Integrated Marketplace.

“We were looking at an evolutionary approach to developing a full market, and to enable the members to move incrementally along a path as opposed to making what we would call a ‘big bang’ — just throwing all the market system together at once,” SPP Executive Vice President and Chief Operating Officer Carl Monroe said.

“I remember one meeting when we were trying to decide what they wanted to do about creating a market,” he added. “One of the members came up during a break and asked if there was a way to do part of a market. We started talking. Then a couple more members came up. That break is where we came up with the idea to launch the EIS market first and then add functionality to it as we saw fit.”

Creating a way for members to buy and sell power through the SPP RTO proved to be one of the organization’s most difficult achievements. “It was the biggest project we had ever undertaken,” Brown said.

“Implementing security coordination — that was a big project, but it was doing stuff that operators were born to do. Implementing the tariff — yeah, it was a regional tariff, not an individual company tariff — but it was not rocket science,” Brown added. “There was nothing unique or cutting edge about the settlement systems or the stuff in the control room.

“The implementation of the EIS market was cutting-edge. We were using database technology that was new. We were using hardware technology that was new. The protocols were all different. Nobody had experience in it. Our vendor was developing our software...
from scratch. I mean, there wasn’t any off-the-shelf stuff. It wasn’t something that had been implemented in other markets.”

The EIS market’s development occurred simultaneously with the SPP’s worst growing pains, while Brown was working to recalibrate the corporate culture. In 2006, SPP added more than 100 employees — which entailed scheduling and conducting more than 300 interviews, coordinating almost 50 family relocations to the Little Rock area and adding and outfitting office space which in some cases required whole departments to be relocated. During the same period, SPP also constructed the new primary operations center in Maumelle, launched a new corporate website and developed a more comprehensive emergency response plan.

The EIS implementation was not a good experience from a staff perspective, Brown recalled.

“It was late, and it implemented initially with errors,” Brown said. “Even with the delay, there was concern about whether the hardware platform was stable enough to go into production. All the vendors were pointing fingers. The project management, internal and external, was not good. Quite frankly, it was an embarrassment to me.

“Three years into my leadership as CEO! We were in the process of changing. I knew what was wrong, and we had already documented our culture and our business model, and began holding people accountable to it.”

But, Brown’s changes weren’t happening fast enough to offset the stress of undertaking such a large project.

Initially, SPP planned to launch the EIS market in October 2005. In late 2004, Brown announced they had decided to delay launch until a time “when we are reasonably confident that market operations issues are resolved.” SPP first pushed the launch to March 2006 and ultimately to Feb. 1, 2007.

The 2006 Annual Report reflected some of the frustration: “Considering implementation of all of SPP’s previous initiatives, this market brings to mind a quote from
Machiavelli’s *The Prince*, ‘Nothing is more difficult to carry out, nor more doubtful of success, nor more dangerous to handle than to initiate a new order of things.’”

Despite the challenges and complications, the EIS market launched successfully. The project cost $33 million, and pre-launch estimates predicted members would see $80 million in net trade benefits during the first year of operation. Actual performance exceeded the estimate significantly when actual net trade benefits for the first year of operation were $103 million.

Brown remained philosophical about the experience. “In the grand scheme of things, for as big a project as it was, it certainly was better than any other ISO/RTO had done on market implementations.

“Just to put an exclamation point on what our culture came to with proper management of people and everything else, look at the Integrated Marketplace,” Brown said. “It made the EIS pale in comparison from a complexity perspective — it was an EIS market tenfold, on steroids. And yet, we just nailed it. So that’s what can happen when you’ve got the whole organization aligned — stakeholders and members, board members and staff.”

**REGIONAL ENTITY**

After the North American Electric Reliability Corporation (NERC) had been formed in 1968, the organization created a set of reliability guides. Regional Reliability Organizations, including SPP, complied with the recommendations for operating criteria and planning guides on a voluntary basis.


As part of the implementation of the EPAct 2005, FERC certified NERC to serve as the nation’s Electric Reliability Organization (ERO) in July 2006. This move made NERC responsible for developing and enforcing mandatory electric reliability standards under FERC’s oversight.

On April 27, 2007, SPP became one of eight Regional Entities (REs) selected by NERC to enforce the new standards. The designation gave SPP the authority to audit, investigate and otherwise ensure that users, owners and operators of the bulk power system complied with NERC’s mandatory reliability standards. All bulk power system owners, operators and
users were required to register with a Regional Entity for the functions they performed (e.g., transmission owner, balancing authority, etc.).

This development put SPP in a unique position as the only organization that would serve as both a Regional Entity and Regional Transmission Organization.

SPP revised its bylaws to accommodate creating the SPP Regional Entity (SPP RE) as a separate unit with separate governance by three independent trustees who operated separately from the SPP Board of Directors. The trustees would make decisions regarding the SPP RE budget, compliance enforcement actions and penalties.

The general manager of the SPP RE reported directly to the trustees, and only the trustees or certain SPP RE staff members had the authority to make compliance and enforcement decisions for SPP-registered entities.

The staff of SPP RE was independent of all bulk power system users, owners and operators, and funding was provided by Load Serving Entities, which NERC bills quarterly for their share of the RE and NERC budgets.

The SPP RE performs multiple functions, including:

- Monitoring and enforcing compliance with Critical Infrastructure Protection (CIP) and traditional (planning and operating) standards using eight methods: audits, self-certifications, spot checks, periodic data submittals, self-reports, exception reports, complaints and investigations
- Registering and certifying bulk power system users, owners and operators
- Publishing annual summer, winter and long-term reliability assessments
- Analyzing regional system events and developing lessons learned
- Conducting outreach via newsletters, workshops, webinars and lessons learned
- Developing Regional Standards

“SPP and its stakeholders thought it made sense for the RE and RTO functions to operate under one organization,” SPP RE General Manager Ron Ciesiel said. “Rather than creating an entirely new committee structure, the SPP RE could leverage SPP’s existing organizational group structure and host concurrent meetings to bring efficiencies.”

To ensure no conflicts of interest, the SPP RE works from a restricted-access space and has no reporting relationships between the RE and RTO. Also, in 2010, SPP engaged a separate Regional Entity to monitor the SPP RTO’s compliance.
While the SPP RE operates independently of the RTO, it is part of SPP Inc. The Regional Entity uses the parent organization’s accounting, IT, human resources and other resources, which required creating the proverbial Chinese wall to ensure the SPP RE staff simply could not discuss certain matters with RTO employees.

Since its inception, the RE’s focus evolved somewhat.

“While monitoring and enforcing standards is part of what we do at the SPP RE, an important part of our role is encouraging registered entities to devote more effort toward learning, understanding root causes of system issues, sharing lessons learned and self-reporting issues rather than waiting for them to be uncovered by an auditor,” Ciesiel said. “Reliability excellence is best achieved through proactive improvements, not reactive improvements made in response to specific violations.”

**SPP BUSINESS MODEL**

As SPP continued to grow, take on new responsibilities and pursue new opportunities, the organization became more compartmentalized, which caused concern for Brown. He said he thought too many people were working in silos without much knowledge of SPP’s overall mission, business or strategy.

The SPP executive team drafted a strawman business model to help the growing company stay on track. The model was presented to directors, managers and employee focus groups. Brown presented the resulting model to staff in November 2007.
He told staff: “The component in the center of our model — strategy — has been in place since 2003 when our mission statement and our value propositions were reaffirmed and/or approved by our board of directors.

“In late 2005 and 2006, staff undertook the challenge of documenting our core ideology, culture drivers and values. This year, we documented the hardware pieces (critical functions and organization) and developed the remaining elusive software pieces (people and leadership).

“Alignment is the key to moving forward. We need to be constantly vigilant that our daily work, hiring process, performance evaluations and departmental goals match up with the SPP business model.”

Since Southwest Power Pool’s beginning, transmission issues topped its list of concerns — first from a reliability standpoint and later from an economic standpoint. An adequate transmission system is integral to mitigating against blackouts, and all the generation in the world is rendered useless if its output can’t be transported to locations that can use electricity as it’s generated.

As a participant of SPP’s Synergistic Planning Project Team noted in 2009: “Transmission is a great enabler of all uses of the power network: generator interconnection, load reliability and expansion, smart grid applications, emerging technologies and interstate power commerce to name a few. Transmission plans need to accommodate all of these applications and cannot limit themselves to a subset of these goals. Transmission planners need to not only accommodate existing and traditional generation resources and dispatch patterns but need to be prospective in their assessment of emerging resource portfolios, such as large penetrations of wind resources, coal-by-wire, pumped-storage hydro, etc. Transmission planners must continue to assess reliability needs and offer solutions to create and maintain a robust grid, be it thermal capacity, voltage stability or even rotor angle stability.”

Most of SPP’s transmission-owning members built their own local networks, and regional planning consisted of figuring out the interconnections between the various networks.
Regional transmission and early transactions involved finding ways to route electricity from point A to point B using the existing patchwork of lines.

Beginning in 2003 with SPP’s LaCygne-Stilwell project, system expansion became increasingly regionally focused, and members began sharing the cost of projects that benefited the entire group.

**SPP TRANSMISSION EXPANSION PLANNING (STEP)**

SPP initiated a long-range project to meet future transmission needs by creating the SPP Transmission Expansion Plan (STEP). The scope of the resulting 2006-2016 Transmission Expansion Plan was unprecedented regarding steady-state and dynamic analysis using an extended 10-year planning horizon.

The plan identified $1.4 billion in required reliability upgrades broken down into these categories:

- 47 percent New lines
- 29 percent Line rebuilds/upgrades
- 14 percent New transformers
- 6 percent Transformer/substation upgrades
- 4 percent New capacitor banks/reactors/devices

Additionally, the plan called for six economic projects that would total an investment of $141.5 million.

During the first year, the members completed 18 transmission projects totaling $27.8 million and invested steadily increasing amounts over the next decade.

SPP recognized transmission planning would be a moving target, so it structured the STEP process to reevaluate the region’s 10-year planning needs on an annual basis. For example, the 2008 plan identified approximately $2.2 billion of transmission network upgrades for the years 2008 through 2017.

SPP held two STEP regional planning summits each year to give stakeholders the opportunity to share their thoughts and opinions about the transmission expansion plan. The groups evaluated potential solutions and discussed various case studies to give stakeholders an idea of what the grid will look like in the future.
In 2005, the Federal Energy Regulatory Commission (FERC) approved a cost-sharing formula developed by the SPP Regional State Committee (RSC) and Cost Allocation Working Group (CAWG) that called for regional/zonal sharing of the cost for upgrades. For reliability upgrades (projects identified by SPP as necessary for continued reliability of the SPP transmission system), two-thirds of the costs would be assigned to the transmission zones that received megawatt-mile benefits with the remaining one-third assigned to all zones on a load/ratio share. For upgrades driven by economic benefit, the costs were shared on a voluntary basis by those entities that desired the facility to be built.

Building on the success of the initial STEP analysis, SPP refined its methods for regional transmission planning/funding through an evolutionary process that included:

- Balanced Portfolio Initiative in 2008
- Synergistic Planning Project in 2009
- Highway/Byway Cost Allocation in 2010
- Integrated Transmission Planning in 2010

**BALANCED PORTFOLIO**

SPP’s Balanced Portfolio initiative focused on ways to develop a group of economic transmission upgrades that would benefit the entire region and to allocate the cost of the upgrades amongst the members.

“Under the balanced portfolio approach, SPP evaluates the benefits of a group of economic upgrades rather than calculating upgrades on a project-by-project basis,” Les Dillahunty explained. “If a power provider’s customers will receive 25 percent of the benefits from a project, the provider and its ratepayers will be responsible for 25 percent of the cost.”

The goal — to reduce congestion on the SPP transmission system — would increase reliability, provide economic benefits for the members by lowering generation production costs, lower required reserve margins and provide environmental benefits by creating paths to incorporate renewable resources.

The challenge lay in creating a plan in which the sum of the benefits for each zone affected by the projects would equal or exceed the sum of the costs.
After two years of analysis and drafting, SPP filed amendments to the SPP tariff to incorporate the Balanced Portfolio cost-sharing model on August 15, 2008. FERC commissioners unanimously approved the filing in October 2008.

Then-FERC Chairman Joseph Kelliher commended SPP and the SPP Regional State Committee for what he called an “interesting proposal.”

“This filing was developed carefully over a two-year period and enjoys broad support in the region,” said Kelliher. “One of the most difficult barriers to grid expansion is cost allocation and recovery for a number of reasons, cost allocations and recovery is much more difficult for transmission projects than other network facilities, such as interstate natural gas pipelines.”

Others echoed Kelliher’s commendations. Then-FERC Commissioner Marc Spitzer called it a win-win-win scenario, stating that “SPP and its stakeholders have from whole cloth created a political constituency for transmission that is desperately needed to benefit customers.”

Praise also came from state commissions.

“When you make transmission investments, you don’t make them for the whole region at once; you have to target the biggest, most cost-effective investments,” Mike Moffet from the Kansas Corporation Commission said.

“I think SPP was successful because of a very open and transparent process,” Moffet added. “People generally react better if they’ve had a say, even if they didn’t get their way. From my observation of what SPP has done, it’s a much more inclusive project-building process — including the role of state regulators.”

The first group of projects approved under the Balanced Portfolio consisted of seven new high-voltage transmission projects projected to cost more than $700 million.

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BUILDING A NATIONAL GRID (2008)

In the SPP 2008 Annual Report, leadership addressed the need for transmission planning on the national scale by saying: “We add our voice to those supporting the goal of a national transmission grid, similar to Eisenhower’s interstate highway system.

“We also support federal leadership in helping find solutions to complex issues such as aging infrastructure, the integration of renewables, the continuous increase in demand for electricity, the role of demand response, and managing greenhouse gas emissions.

“Simply put, it is time for a whole new way of thinking about transmission planning. We must move out of the historical reactionary mode and allow bulk transmission to be a visionary enabler for economic development.”
SYNERGISTIC PLANNING PROJECT

In 2009, SPP tackled one of its greatest challenges — creating a coordinated approach to transmission planning.

An anonymous response to one of SPP’s annual stakeholder satisfaction surveys in 2009 summarized the problem, saying, “Currently, SPP has numerous planning initiatives (Balanced Portfolio, EHV Overlay, transmission requirements for cluster analysis, Joint Coordinated System Plan) that are largely independent of each other. The result is a fragmented approach to transmission planning. Each of these initiatives utilizes different processes, cost allocation methodologies, cost/benefit analyses, etc. We need to take a holistic approach to planning and avoid looking at each of these initiatives in isolation. We support consolidating these into one comprehensive regional planning process.”

SPP created a Synergistic Planning Project Team (SPPT) after the board asked Nick Brown to address the gaps between SPP’s various transmission planning processes. The group consisted of state regulators and SPP member representatives along with high-level staff members.

Brainstorming possibilities as if no physical, financial or legislative constraints existed allowed the group to look beyond traditional methods for approaching transmission issues. Out of this process, the group developed three major themes:

- **Priority projects** — The team wanted to ensure that, as SPP shifted its focus to comprehensive, long-term transmission planning, it did not lose near-term opportunities like projects that showed up in multiple system evaluations as needed to relieve congestion on existing flowgates and to tie the eastern and western sections of the region together.

- **Highway/byway cost allocation** — SPP’s various transmission projects had resulted in numerous cost-allocation methodologies, including zonal rates, regional rates, megawatt-mile rates, postage-stamp rates and others. The team thought the organization would benefit from creating standardized cost allocation.

- **Integrated Transmission Planning (ITP)** — The team thought SPP should consolidate its existing studies and planning processes with a single, integrated process that focused on connecting known load centers to known or expected generation sources with a transmission backbone.
A member of the SPPT noted at one of their meetings: “SPP’s future is an energy market with adequate rules or protocols to ensure reliability. Long-range planning studies need to focus on development of a robust grid for the future, which frames reasonable expectations. Decisions need to be made on implementing projects ASAP based on 20-25 year projections capturing all realistic and quantifiable benefits, which are supported by stakeholders and SPP executive management, not just Adjusted Production Cost over a 10-year horizon. Continuous restudy needs to be performed going forward to ensure incremental expansion is prudent. But decisions need to be made, and projects implemented because doing nothing has a cost. We must accurately and effectively demonstrate and communicate the cost of doing nothing.”

HIGHWAY/BYWAY COST ALLOCATION

Members agreed with the team’s assessment. One member said, “Currently there are multiple and confusing cost allocation methodologies. We recommend a single cost allocation methodology that is predictable and easy to implement. We believe that a ‘highway/byway’ methodology, using 345 kV and above as the highway and lower voltages as the byway, would meet the necessary criteria of being straightforward, easy to implement and applicable to all transmission facilities. This methodology allocates the costs of facilities that provide regional benefits on a regional level and the costs of facilities that provide more localized benefits on a local (zonal) level.”

The recommended approach to cost allocation was something the industry hadn’t seen before.

**SPP MEMORIES: THE “CORPORATE JET”**

Before Paul Suskie joined the SPP staff, he served on the Regional State Committee as the commissioner from Arkansas. “I heard this rumor that there was this corporate jet,” Suskie said. He learned the truth when he joined the staff. “I would say it’s a Volkswagen with wings – it’s a little bitty plane. … It’s so small it has a parachute – not for the passengers, for the plane!” Suskie said.

In July 2002, Nick Brown and Tom Dunn jointly purchased a used Cirrus SR-20 airplane due to a huge increase in travel and specifically to remote locations of many members and potential members with limited or no commercial air traffic. Both officers had just completed requirements for flight under visual flight rules and were working quickly toward their instrument ratings with a SPP employee who was a certified flight instructor.

The single 200 hp engine, four seat airplane has been flown approximately 4,000 hours (645,000 miles) on SPP business, visiting 119 airports in 31 states. According to Brown, “The best thing about the plane is more nights at home with my wife. After the initial certifications, the only difference in using your personal car for business travel is the recurrent training.”
“The RSC style with respect to the highway/byway process was revolutionary when it happened,” Chairman of the Board of Directors Jim Eckelberger said. “When we agreed to become an RTO, we agreed to give the [Regional State Committee] the authority to do that sort of thing, which in other RTOs is held by the board. We’ve shared authority in a way that has worked out pretty well.”

On April 19, 2010, SPP made a FERC filing for a highway/byway cost-allocation plan devised by the SPP Regional State Committee. The plan included three tiers:

- Electricity highways — costs for projects more than 300 kV would be shared by electric utilities across the entire SPP footprint based on their historical use of the region’s transmission system.
- Electricity byways (mid-tier) — costs for projects more than 100 kV and less than 300 kV would be allocated on a one-third/two-thirds, regional to zonal (service territory) basis.
- Electricity byways (low-voltage) — cost of projects less than or equal to 100 kV would be allocated entirely to the zone in which they are located.

FERC approved the plan June 17, 2010, to the dismay of a group of members who had concerns about the new cost allocation model. Transmission Hub reported the issues centered on concerns “that the methodology did not satisfy the cost-causation principle, was unduly discriminatory and that the commission ‘did not base its determinations on record evidence, ignored testimony filed by protestors and accepted SPP’s studies at face value.’”

After FERC denied the petition for rehearing, the group filed a complaint against FERC with the 8th Circuit Court of Appeals on December 13, 2011.

Regardless of the court proceedings, SPP had formed the Regional Allocation Review Task Force (RARTF) in June 2011 to address the group’s concerns. The task force’s members included representatives from the SPP Regional State Committee and SPP members.

The RARTF reported April 2, 2012, the group had “worked in good faith toward the goal of developing the policy, methodologies, action items and recommendations — including a near-future review of needed business practices and tariff provisions — that would be satisfactory to all affected parties.”

On April 4, 2012, the protesting group withdrew its federal appeal.
“Through a joint effort between our members and SPP’s Regional State Committee, we conducted an open and transparent process to establish the methods to review the fairness of the highway/byway cost allocation methodology,” said Paul Suskie, SPP’s General Counsel and Senior Vice President for Regulatory Policy. “The result of this work gave the appealing members confidence in the process and helped lead them to withdraw their appeal.”

“Highway/byway has become, really, a model for the nation on seeing how investing in infrastructure that’s needed — that produces benefits for consumers — can get done,” Steve Gaw said. “And it all started, in large part, here as the result of a seed of an idea that was not just planted but was fertilized, and watered and carried forward by a lot of people. I give the SPP board a tremendous amount of credit — SPP staff as well — for helping to guide all of this through and working with commissioners and commission staff to try to get the problem solved. Today we have a much, much better place for consumers.”

INTEGRATED TRANSMISSION PLANNING (ITP)

The board approved the Synergistic Planning Project Team’s recommendation to create an Integrated Transmission Planning (ITP) process at the October 2009 board meeting. The ITP process emphasized the need to develop a transmission backbone large enough in both scale and geography to provide flexibility to meet SPP’s future needs.

The system used a three-year, iterative method — a way to arrive at decisions or desired results by repeating rounds of analysis — that included 20-year, 10-year and near-term assessments.

“The 20-year assessment looks at what high-voltage transmission will be needed 20 years out to meet load growth and other future scenarios,” Les Dillahunty said. “Due to the uncertainties involved in forecasting future system conditions, a number of diverse futures or scenarios are considered that take into account multiple variables. Consideration of multiple futures or scenarios provides for a transmission expansion plan that evolves as economic, environmental, regulatory, public policy and technological changes arise that affect the industry.”

Initiatives such as plug-in hybrid electric vehicles, smart grid, renewable electricity standards, environmental regulations, energy storage and conversion applications and other future technologies will change the way the electric grid is utilized. The ITP used futures...
defined by the SPP Strategic Planning Committee based on input from the Economic Studies Working Group for the models.

“The 10-year assessment will evaluate lower-voltage solutions for meeting needs over the next decade, and will analyze whether projects identified in the 20-year assessment need to be initiated earlier,” Dillahunty explained in an October 2009 press release.

“The annual near-term assessment includes local planning needs and primarily focuses on transmission needed to keep the lights on in the next few years,” he added.

SPP staff and members completed the first ITP 20-year assessment, evaluating upgrades needed by 2030, during 2010 — providing the organization a much-needed roadmap for the future.

“The annual near-term assessment includes local planning needs and primarily focuses on transmission needed to keep the lights on in the next few years.”
Much of SPP’s future depended on successfully upgrading and expanding the existing transmission system. Having a robust transmission system not only improved reliability but also allowed SPP to grow geographically, incorporate new energy sources and expand to include a fully integrated marketplace.

NEW MEMBERS EXPAND FOOTPRINT

In April 2009, Nebraska Public Power District, Lincoln Electric System and Omaha Public Power District joined SPP, broadening SPP’s footprint as a reliability coordinator by 30 percent. The Nebraska entities also began participating in the energy market and transmission-planning processes, and SPP began administering transmission service for the new members.

To incorporate the new members, the board had to amend both the SPP membership agreement and the tariff to accommodate provisions of the Nebraska Public Power District and Omaha Public Power District as state power agencies and Lincoln Electric System as a municipal utility.

The additions brought the member count to 53 and increased the number of states SPP served from eight to nine.
The expansion of SPP’s footprint brought with it the potential to incorporate significant amounts of energy generated from wind — a promising source of renewable energy.

In 2008, wind made up only one percent of SPP’s generation mix. By early 2016, that number would jump to nearly 15 percent.

However, incorporating wind presented several challenges. First, transmission is vital in moving renewable energy from where it is generated to where it is needed, and so transmission lines would have to be built to tie wind farms (usually located in sparsely populated areas) into the grid. For example, SPP estimated Oklahoma alone would need $3.4 billion in transmission construction to upgrade its high-voltage grid to harvest the wind power from the panhandles of Oklahoma and Texas and move it eastward to various load centers.

Also, wind could not be summoned up at will, which meant relying on weather forecasts to plan generation and maintaining contingency plans in case the weather changed suddenly.

SPP commissioned an extensive wind-integration study in 2009 to examine these and other issues while looking at
ways to help its members fund wind development. The Regional State Committee and Cost Allocation Working Group developed a process that made new wind resources eligible for regional cost-sharing as part of SPP’s base plan funding. Under this funding plan, part of the cost is allocated on a region-wide basis with the remainder of the cost assigned to parties in the zone that benefit directly from the upgrade. This move was applauded by the American Wind Energy Association as a major victory for the people of Oklahoma, Kansas, Nebraska, Missouri, Arkansas, Louisiana, Texas and New Mexico, “who could expect to see lower electricity prices, more jobs and a cleaner environment as a result of the wind energy development.”

The wind-integration study revealed enhanced electricity reserves and major transmission reinforcements would be needed to integrate higher levels of wind generation. With the upgrades in place, however, there would be no significant technical barriers or reliability problems to integrate wind energy levels up to 20 percent.

Electrical Contractor reported: “The study found that an increase in the wind-penetration level causes changes in power-flow patterns, particularly increased flow from the western to the eastern part of the region. This would require upgrades and reconfigurations to the transmission system.”

**EARLY WIND POWER**

According to an 1890 issue of *Scientific American*, Charles F. Brush of Cleveland, Ohio, developed the world’s first windmill that could generate electricity.

> “With the exception of the gigantic windmill and electric plant shown ... we do not know of a successful system of electric lighting operated by means of wind power.

> “The mill here shown, as well as all of the electrical apparatus used in connection with it ... have been designed and carried out according to the plans of Mr. Charles F. Brush, of Cleveland, Ohio. ...”

> “The speed of the dynamo at full load is 500 revolutions per minute, and its normal capacity at full load is 12,000 watts. ...”

> “It has been in constant operation more than two years, and has proved in every respect a complete success.”

Source: “Mr. Brush’s Windmill Dynamo,” *Scientific American*, Dec. 20, 1890
Other findings included:
- Integrating levels of wind for the 10 percent and 20 percent cases could be attained without adversely impacting system reliability.
- Wind integration would be greatly facilitated by the creation of a consolidated balancing authority for the entire region. A balancing authority should reduce overall needs for electric reserves and flexible resources and provide greater flexibility to quickly respond to injections of wind energy into the grid.
- Efficient wind integration requires a sophisticated process for determining what generating units are used throughout the region, explicitly addressing the uncertainty associated with wind-forecast errors. The implementation of a centralized forecasting system would be advantageous.

Wind integration held potential for the market, too — especially for selling wind to the more densely populated areas on the East Coast, where building wind farms would be problematic.

SPP’s commitment to adding wind to the generation mix paid off. On Feb. 17, 2016, SPP topped 10,000 megawatts of wind energy for the first time. Then on April 24, SPP set a record for North American RTOs in wind penetration (the amount of load served by wind during a particular interval) — a whopping 49.17 percent.

**SPP GETS A NEW HOME**

By 2008, SPP was bursting at the seams — both in terms of staff growth and the number of functions/services provided. Employees were located on multiple floors of the Plaza West building, at the Maumelle operations center and in the GMAC building in west Little Rock.

Fred Meyer from Empire District Electric Company remembered visiting the SPP offices during that period.

“You literally walked in the room, and the door barely opened to where it cleared the administrative assistant’s desk,” Meyer said. “[There was] an alcove that had three people...
working in it. It was kind of like in a church pew. They all had to get up to let one guy out if he had to use the restroom or something.”

The board weighed the options of purchasing the Plaza West building, purchasing another building or building a new facility to meet the growing needs of the organization. They also considered moving the organization’s headquarters to another state.

In the end, the board decided building a new facility in Little Rock offered the best option and began the hunt for an appropriate site.

The process involved acquiring land, annexing it into the Little Rock city limits and having the zoning changed. In September 2010, SPP broke ground for its new corporate center at 201 Worthen Drive in west Little Rock.

They planned for the 20-acre campus to include:

- A 36,750-square-foot data and operations center to house SPP’s computing assets and the 24/7, real-time grid operations
- A four-story, 155,000-square-foot office building
- A three-story parking deck

SPP wanted the building to incorporate sustainable design and energy efficient operations, so the design — created by Witsell Evans Rasco architects and constructed by Nabholz — incorporated the principles of the U.S. Green Building Council’s LEED requirements.

Plans for the operations center included facility “hardening” — evaluating the potential risks and threats that could make it vulnerable to catastrophic events, both natural and man-made. For example, the reinforced concrete structure was built to withstand a tornado with winds up to 261 mph.
“The new facility was built for the work we do,” according to the 2012 Annual Report. “The modern, energy-efficient buildings are filled with abundant natural light and formal and informal work spaces, where ideas can be shared and improved upon.”

The $62 million facility received LEED Gold status and offers many amenities including:

- The conference center seated up to 240 people in six different rooms
- The operations center included a wall-size monitor that provided the operators an easy look at the SPP system and its various inputs
- The auditorium seated 540 people
- A 300-seat cafeteria — including outdoor seating
- 11 beverage stations throughout the facility

Much thought went into the design elements to reflect SPP’s culture. The executive offices were located on the second floor — making the upper management easily accessible and “in the middle of the everyday operations.” The building was enabled for wireless connectivity, which allowed employees to work at their desks or in informal groups anywhere in the building. Even the two-story kinetic sculpture that dominated the reception area conveys a message.

Royal Miree, an artist in Birmingham, Alabama, created the 20-foot, 350-pound piece for SPP. Miree said the concept for the sculpture revolved around the search of achievable balance.

“Back in 2011, I met Nick Brown along with headquarters architect David Sargent,” Miree said. “We found a relationship between the sculptures and how Southwest Power Pool directs its efforts for balancing systems — having many dissimilar parts and pieces to create relationships with and connections between — that become a whole and unified functioning thing.”

The sculpture’s analogy also implied how sensitive balance can be. The piece’s balance was sensitive to within two ounces.

“You wouldn’t think a building or a campus would have an impact on the morale of employees, but it’s amazing to me how excited the population is about the move,” Brown said in 2011.
AWARD WINNING EMPLOYER

More factors than the move to the new building contributed to employee morale. SPP had a long history of creating a family atmosphere and providing excellent benefits.

The Principal Financial Group recognized SPP as one of its 10 Best Companies for Employee Financial Security in 2005. Karen Ignani, president and CEO of America’s Health Insurance Plans served as one of the judges for the competition.

“By distinguishing employers who are investing in their employees and publicizing their best practices, the program sets a standard and a benchmark for other employers,” Ignani said.

At the time SPP won that award, it had 163 employees. By the time the company moved into the new building, it had more than 550 employees.

In 2013, Arkansas Business partnered with the internationally renowned Best Companies Group and the Arkansas Society of Human Resource Management to bring the Best Places to Work program to the state.

The Best Places to Work program ranked organizations on an overall employee-engagement score calculated from surveys distributed to employees. Winners were chosen entirely based on the results of the survey. The survey provided companies with a free evaluation tool to gauge how their employees felt about their workplaces.

Arkansas Business recognized SPP as one of the 12 best places to work in 2013. In the 2014 competition, SPP received the Benchmark Award, naming it as the state’s overall, highest-ranked place to work after the company received an overall engagement score of 93 percent — significantly higher than the 70 percent needed to achieve an excellent rating.
A sampling of the employee comments reveals the reasons for the high rating:

- “I think what is most important is that silos work together here rather than fight for resources and infight as I have seen at other organizations. We all seem to have aligned goals.”
- “It provides a challenging work environment which is always changing, with new and different goals, and with recognition and compensation to reward those meeting the challenges. I see top management walking the talk, engaging employees personally as well as professionally, delegating responsibilities with the confidence that those employees will meet their expectations and allowing employees flexibility in how they meet those expectations.”
- “Southwest Power Pool has proven time and again that it cares for its people, not just by talk but by actions. We take up collections for disasters, we get involved in the community, and we genuinely care for each other. We have even started a fitness program. We are encouraged to take care of ourselves. I also see how hard my managers and supervisors work and it motivates me to work even harder!”
- “It aligns skills and talents with job roles. We have ... the right people doing work that is meaningful to them and doing it in an amazing way. SPP understands the immense potential in each of us and challenges us to realize our greatness in a way that benefits the individual, SPP and our members.”
- “SPP employees are valued/viewed much like a family at work and SPP promotes balance and provides support for its employees’ home families. The work environment could not be more conducive to productivity. Employees are provided space to work outside of their assigned areas, such as a cafe and patio area where Wi-Fi is provided. This promotes creativity and overall effectiveness.”

In 2014, Arkansas Business recognized SPP with its Benchmark Award naming it as the state’s overall highest-ranked place to work in Arkansas.
“SPP fosters an environment of collaboration and trust, both with its members and among its employees. SPP values the individual person, as well as teamwork, and creates a culture of integrity, volunteerism and professionalism. The leaders not only ‘talk the talk,’ but they ‘walk the walk’ and lead by example each and every day. The leaders are humble and collaborative but are decisive and motivational as well.”

“SPP has a strong established culture that is communicated, expected and executed in everything we do. Our leadership’s commitment to continuous improvement is evident in the time given to training and review. And lastly, there are great people who work here. The compensation and benefits, the interesting work, the job security — all attract people who want to be here, who enjoy being here and who treat each other as team members.”

“The company is very family oriented what recognizes we are people first and employees second. Very understanding of personal needs and is very flexible. I feel very important to the organization and the atmosphere is encouraging and makes me want to work hard to produce good work.”

“This is one of the few organizations where a person could expect to have a full career and retire.”

“When I was at the [Arkansas Public Service] Commission, I was on the outside looking in, and I really liked the culture perception that Carl, Nick and Les portrayed,” Paul Suskie said. “So I had a good outside impression, but I also knew that entities put their best foot forward when a commissioner’s around. After coming to SPP, I realized that the culture is even better than I thought.”

Perhaps Claudia Milam stated it best when she retired in 2006. She told her fellow employees “You always think the grass is greener somewhere else. You’re working in the greenest grass there is.”

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The SPP cafeteria has indoor and outdoor seating as well as many other amenities for employees.
In 2014, SPP completed its most ambitious project to date — the Integrated Marketplace (IM). The Integrated Marketplace built upon the existing Energy Imbalance Service (EIS) market that had been in place since 2007.

Carl Monroe explained the need, “The EIS market just ran every five minutes with whatever the members had online at the time. They said, ‘we’re not sure we should be running all this generation. In fact, we think we’re running too much generation because we’re doing it all individually. We’re not doing it as a region.’”

In 2010, SPP reported the IM would include:

- A Day-Ahead Market with Transmission Congestion Rights — this market would determine which generating resources should be used based on region-wide prices and demand, reducing overall costs for the footprint
- A Reliability Unit Commitment process
- A Real-Time Balancing Market (to replace the EIS market)
- Incorporation of price-based Operating Reserve procurements

These markets would allow SPP’s customers to take better advantage of the region’s diverse generating resources — including coal, natural gas, hydro, wind, solar and nuclear. SPP estimated the $115 million project would result in net savings of $100 million per year to the region.

In conjunction with launching the Integrated Marketplace, SPP would serve as a Consolidated Balancing Authority (CBA) — replacing the existing 16 Balancing Authorities (BA) in the SPP market footprint. As the CBA, SPP would be responsible for balancing the region’s supply and demand, maintaining frequency and maintaining electricity flows between adjacent BAs. A CBA must meet numerous North American Electric Reliability Corporation (NERC) standards and criteria and has an obligation to NERC to meet performance standards.

**THANK GOODNESS FOR ANALOGIES: SCHEDULING**

Scheduling is the backbone of wholesale energy transactions and involves several steps. An airline analogy can be used to describe how scheduling works:

Reserving transmission service at the tariff desk is like buying an airline e-ticket. You have reserved your place on the transmission line.

After you buy or sell transmission, a tag is generated. The tag is like a boarding pass. You are ready to begin the transaction.

The schedule is created from the tag. Having your schedule approved is like taking a seat on the plane. All parties have fulfilled their part of the contract. Once the schedule is approved, generators begin to move to provide the energy for the transaction.
But first, SPP had to put the IM in place.

“Our challenge was that nobody else had done it before — put it in on time and on budget — and we were determined to be the first to do that,” Bruce Rew said.

SPP leadership was equally focused on how the project would be done — in the spirit of SPP’s corporate culture and without the problems that had occurred while implementing the EIS market.

The planning team consulted with other organizations that had implemented markets, executing memorandums of understanding with PJM Interconnection, Electric Reliability Council of Texas (ERCOT) and other regional organizations with similar energy markets. These groups shared their expertise, experience and lessons learned from development, implementation and operation of their markets.

Using that information, SPP created a detailed implementation plan to map dependencies and put tight project-management controls in place. Additionally, the group arranged for periodic independent audits to verify the project remained on schedule and on budget.

Even with those controls in place, the project proved to be complicated. Rew said the project began before the design was 100 percent complete so some things were changed and adjusted during the development process.

“The market participants were very engaged in it,” Rew added.

The plan called for five sub-stages leading up to market trials planned for the summer of 2013:

- Connectivity test
- Transmission congestion rights market test (mock auctions)
- Structured/unstructured test
- Parallel operations test
- Integrated deployment test

According to the 2012 annual report: “We moved from designing the systems and interfaces that will make the Marketplace work to building, testing and integrating them. As 2013 began, the program was conducting Connectivity Testing and TCR (Transmission Congestion Rights) Market Trials, with an eye on the March 2014 go-live date.”
The Marketplace leadership team downgraded the program’s status to “yellow” in 2012, acknowledging concerns that delays in software development, compressed timelines and increased workload on program resources threatened the marketplace’s deadline.

Market participants had requested at least nine months of market trials, and staff worked diligently to balance the demands of rigorous testing requirements with the need to deliver the marketplace on time.

“Our focus remains on getting everyone — SPP, vendors, and market participants — to the March 2014 finish line at the same time,” said the 2012 Annual Report.

According to software developer Informatica, “SPP needed to replicate data collected by production transactional systems from 400+ source systems (including energy produced and consumed and power line data) into an analytics data source, making it available for analysis and reporting in the Integrated Marketplace.

“The scale of transactional data made it prohibitive to manage in the production database because Integrated Marketplace requires optimal performance, stability and scalability to operate effectively.”

The system created for the IM reduced the typical analysis time from one day to 20 minutes.

Creating the market involved about 70 consultants in addition to SPP staff. To keep the project on track, SPP monitored readiness metrics using regular updates from market participants and staff using an online IDashboard. Leadership also stepped up outreach efforts to members (with site visits and on-site training opportunities), vendors (with participant forums) and regulatory entities (with educational workshops).

“Our staff did a really good job of working through the problems without pointing fingers,” Rew said. “We were able to look at a problem and come up with creative solutions —
figuring out ways that we can get it done. We were flexible on the resources that we used and how we used them.”

For example, when the group realized they didn’t have enough testers to get all the test cases done, they looked to the engineers in the SPP operations center. “There were four engineers that were dedicated to testing that helped us get additional work done that we needed. We didn’t panic when we ran into problems,” Rew added.

In January 2014, SPP stakeholders unanimously approved going live effective March 1, 2014. During the next three months, everyone worked to iron out the final kinks in the system, and at 12:01 a.m. Central Standard Time, the IM went live — making SPP the first Regional Transmission Organization to deliver a Day 2 market on schedule, on budget and at a fraction of the cost of previous implementations.

“One of the challenges we had was there wasn’t a good way for us to test committing the units [turning them on] because the owners were still running their units by themselves,” Rew recalled.

The day after the IM went live it faced an unexpected test: a polar vortex that sent a large pocket of the coldest air in the Northern hemisphere south into the SPP footprint, plunging the area into the deepest of deep freezes.

That cold spell — the second highest winter peak in SPP history — required all of the generation the operators could muster.

“That weekend, we tested [the system] thoroughly. We turned on just about every unit we could,” Rew said.

MOVING NORTH

SPP’s footprint almost doubled in 2015 when the Integrated Systems (IS) — consisting of the Western Area Power Administration (WAPA)-Upper Great Plains region, the Basin Electric Power Cooperative and the Heartland Consumers Power District — joined the Regional Transmission Organization.

The three entities covered much of North Dakota, South Dakota and included parts of Iowa, Minnesota, Montana, Nebraska and Wyoming. Integrating the new members added more than 5,000 MW of peak demand and 9,848 miles of high-voltage transmission lines to the SPP footprint and opened up additional opportunities for developing wind generation.
Additionally, with this transition, WAPA became the first federal agency and first federal power-marketing administration to join a Regional Transmission Organization.

The IS announced its intention to join SPP in early 2014 after a lengthy evaluation process comparing SPP, MISO and a standalone process. The SPP board negotiated the details with IS and approved the agreement in June 2014.

“Joining an RTO is a major shift in the way Heartland has traditionally operated, but we firmly believe our customers will benefit,” Heartland CEO Russell Olson said. “We have enjoyed the collaborative process thus far and believe it is a strong indication of the positive relationship we will have with SPP in the future.”

The addition of the Dakotas brought a boon of geographic diversity to the SPP footprint.

“We now have a winter-peak organization in the north and a summer-peak organization in the South,” Jim Eckelberger said. “For the people in the footprint, that’s a really good thing.”

SPP also completed its first international transaction in 2015, thanks to Canadian interconnections that came with the Integrated System’s addition to the RTO.

Carl Monroe said SaskPower, the principal electric utility in Saskatchewan, came to the RTO’s aid during a mid-December “emergency situation” in North Dakota. Monroe said SaskPower was able to “facilitate power” during a storm and after some transmission outages via existing interconnections in the state.
Southwest Power Pool in 2016 looks very different than the organization that came together to provide power to a wartime defense industry in 1941.

Over the years, SPP has assumed many roles, resulting in an alphabet soup of acronyms and initials. Each role had a corresponding footprint that shows the scope of the organization:

- Regional Entity
- Reserve Sharing Group
- Reliability Coordinator
- Regional Transmission Organization/Tariff
- Integrated Marketplace Region

The Appendix contains lists that define SPP’s footprints and list the members, Balancing Authorities (BAs), Transmission Operators (TOPs), and/or Transmission Owners (TOs) in each of these footprints.

RELATIONSHIP-BASED

A proverb credited to the N’gambai people in Africa captures the essence of SPP: “If you want to travel fast, travel alone; if you want to travel far, travel together.” SPP has succeeded largely because of its commitment to remaining relationship-based.
“Our roster today probably has 300 to 400 people on the various committees, working groups and task forces — bringing a very diverse stakeholder group together to work out very complex issues,” Nick Brown said. “Keeping people at the table working on these issues is just one of our primary functions.”

He pointed out that in 2016 the SPP tariff is more than 5,500 pages of rates, terms and conditions, and SPP settled more than 40 charge types in its wholesale markets, representing more than $18 billion in financial transactions.

“The first time I came to the Regional States Committee, I noticed there were lots of task forces, work groups — dozens and dozens of acronyms,” said Kristie Fiegen, Regional State Committee commissioner from South Dakota. “But the more I understood the culture … It’s all about the stakeholder’s voice. All those acronyms that I didn’t understand are about making sure the stakeholders have a voice.”

“This is a problem-solving organization,” Steve Gaw said. “We try to figure out a way to do what’s best for our

SPP THEN AND NOW: SCOPE OF SERVICES

During the past 75 years, SPP’s role in the energy industry has grown exponentially.

1941 — SPP’s primary role was to coordinate power delivery to a critical defense plant in central Arkansas.

2016 — SPP offers a portfolio of services for its member organizations, including:

- **Regional Transmission Organization (RTO)** — SPP operates the region’s grid minute-by-minute to ensure power gets to customers and to eliminate power shortages.
- **Reliability Coordination** — SPP monitors power flow throughout its footprint and coordinates regional response in emergency situations or blackouts.
- **Tariff Administration** — SPP provides “one-stop shopping” for use of the region’s transmission lines.
- **Regional Scheduling** — SPP ensures the amount of power sent matches with power received.
- **Transmission Expansion Planning** — SPP identifies system limitations, develops transmission upgrade plans and tracks projects to ensure timely completion of system reinforcements.
- **Market Operations** — SPP manages a Day-Ahead Market with Transmission Congestion Rights, a Reliability Unit Commitment process, a Real-Time Balancing Market and the incorporation of price-based Operating Reserve procurement.
- **Compliance** — SPP Regional Entity enforces compliance with federal and regional reliability standards for users, owners and operators of the region’s bulk power grid.
- **Training** — SPP offers continuing education for operations personnel throughout the region. In 2014, it delivered more than 24,000 training hours to 75 organizations.
- **Contract Services** — SPP provides reliability, tariff administration and scheduling for nonmembers on a contract basis.
states at the same time what’s best for the region. And there is a place, generally, that you can find where both of those things align. But, it takes a lot of work and dedication.”

Gaw noted SPP’s attention to detail for creating opportunities to collaborate.

“The particular way the organization handles its board meetings … the Regional State Committee always meets the day before the board meeting,” Gaw said. “There’s always some opportunity in between for an interaction with the board members, with the stakeholders — all of the people that are there. And people get to know one another, and they get an idea about what they’re thinking, not just about what they’re saying because they’re sitting out there making a statement to the board but because they get to interact. I suspect there have been thousands of issues that have been solved because of that kind of relationship work and because this organization views relationship building as a positive for what the organization is trying to accomplish.”

“I think without a doubt it’s the collegial environment and that people have built relationships in the organizations,” Mel Perkins of Oklahoma Gas and Electric said. “I think it’s the real drive to transparency, and if you sit in a room and people don’t agree you sit and talk about it and don’t run off and talk to your attorney behind closed doors.”

“We are where we are now because of the relationships we’ve built over a long period of time,” Lanny Nickell agreed. “We never went to our members and said, ‘Guess what, we’re taking this away from you.’ Our members came to us and said, ‘We want you to do this for us.’ And they wouldn’t have done that if we hadn’t spent a long time working hard to develop relationships and trust.”

TECHNOLOGY DRIVEN

Relationships drove the human side of the equation at SPP, but the organization also relied heavily on technology to provide the infrastructure to support the systems, members and staff.

“SPP is completely technology dependent; there’s no way around it,” Barbara Sugg said. “The days are long gone that the operator can do his job with Big Chief paper and a calculator. Things are so much more complex now that the only way to keep up with the complexity is with technology.”

While implementing the EIS market in 2007, SPP formed the Market Implementation Task Force (MITF) to help members understand the system changes that would take place when the EIS market launched.
It became obvious the needs addressed by the MITF were neither temporary nor specific to market systems. So SPP created the Change Working Group, a permanent group reporting to the Markets and Operations Policy Committee that tracked and managed all of SPP’s system changes and kept members apprised of their status and impact.

Sugg’s wall was covered with “road maps” — graphs that show the planned information technology projects for the next three years. For many years, the IT department operated in reaction to what was happening in SPP. That changed in 2009, when Sugg hired Terry Tally, SPP’s first chief architect. When Tally left, Sugg brought in Srinivas Kolluru.

“Terry helped lay out the vision,” Sugg said. “And Srinivas, who is both strategic and tactical, says ‘let’s get in there and make it happen.”

Technology priorities were a moving target at SPP.

“Technology changes, and that can impact what’s next,” Sugg said. “We are constantly evaluating where are we, where are we going, what’s realistic to get done this year, and what do we have to do for the business.”

The scope of IT responsibilities is staggering. Sugg pointed out every desk in the operations center needs different applications, technology and training because they each provide a different function.

To help juggle priorities, SPP formed an internal Project Review and Prioritization Committee.

“Our directors are now involved in what projects are we going to do and in what order we are going to do them,” Sugg said. The committee reviewed every project request and helped the IT department create the road maps and annual budget based on the prioritization.

Sugg assured her team they don’t need to worry about job security: “If we didn’t get another project request for five years, we would still be busy,” she noted.

FINANCIALLY FIT

To fully appreciate how far SPP has come financially required a look back to the beginning of this century when the company was planning for the energy imbalance (EIS) market.

To build that system, SPP needed to secure a $25 million loan for software and related expenses.
“When I joined, there really was a rudimentary accounting system,” board member Harry Skilton, who served on the Finance Committee, remembered. “The accounting was on a cash basis, and there wasn’t a financial department.”

At the time, SPP’s annual budget was less than $25 million, and the company had few physical assets, so getting the loan proved to be difficult.

Tom Dunn worked as a commercial loan officer at U.S. Bank at the time, and he remembered SPP’s plight: “They pretty much operated on a cash basis with the utilities. If they spent a dollar one month, the next month they would send the utilities a bill for a dollar. That works if you’ve got a $25 million budget and you just bill the members $2 million a month.”

That system proved to be a liability when trying to borrow money, however. During the late 1990s, the financial market flourished with day traders buying and selling on a daily basis and the growing dot-com boom.

When the bubble burst, banks found themselves in a difficult position. Dunn said on one hand, it was difficult for the banks to find people to loan money to, but on the other hand, they were more risk-adverse.

“Even when loan officers had a candidate, they had to get the appropriate internal approver to say it was OK to loan money,” Dunn said. “The approvers didn’t want to do that, because they were seeing all of these credits cratering in the portfolio. The last thing you want to do is put more exposure on your portfolio and let it crater also.”

Using standard criteria, the SPP loan didn’t look promising. “A couple of things were risky from the bank view,” Dunn said. “Number one, they were wanting $25 million to buy software.”

He said banks looked at how they could secure the loans being made. Making a loan for a building or real-estate project meant an asset existed that could be sold to recover the bank’s money. “If it’s highly customized software for the electric industry, there’s no market for it,” Dunn said.
“The second risk was that their balance sheet had nothing,” he added. “It’s not like it was General Electric where they’ve got billions of dollars of retained earnings. This is a balance sheet that had a little cash, a little software, no buildings to speak of, some computer assets and that’s about it. It made it really difficult for the company to borrow money.”

Dunn looked beyond the usual factors and realized the SPP deal had potential.

“It was perfect,” Dunn said. “If you stop looking at traditional bank stuff and just looked at the business, you realize there’s not much risk there.”

He recognized the FERC-regulated tariff guaranteed recovery of up to 100 percent of expenditures and that SPP’s customers were highly regulated, safe utilities operating in monopoly situations.

“Our well-being and our credit are a function of the well-being and credit of our members,” Skilton agreed.

Dunn was able to convince the bank’s higher-ups to approve the loan.

Nick Brown later hired Dunn to oversee SPP’s growing financial needs, and Dunn was surprised to learn exactly how unsophisticated the internal financial system was.

“It was similar to what you would expect at a garage sale,” Dunn said. “We had a woman on staff that was our bookkeeper — and very detailed but not an accountant. A cash-based methodology was what worked for her mind, so cash in, cash out. She kept meticulous records, everything was really correct. But at the end of each month we brought in a local CPA, and he came in and did our closing adjustments — which was essentially taking the cash-balance accounting and converting it to an accrual-based accounting.”

An auditor came in at the end of the year to review the financials, so SPP was able to publish audited financial statements.

“From my days at the bank, I never would have guessed here’s how the internal accounting functioned because I always just received this audited financial statement,” Dunn added.
The amount of money SPP handled each year was staggering. “We’re doing $18 billion dollars a year in transactions under the tariff — and that’s just for energy and transmission service,” Dunn said in 2016. “The budget has grown from $25 million to $200 million.”

“We’re spending $10 to $20 million a year just replacing assets,” he added. “That amount is getting close to what our total budget was when I started.”

In 2016, SPP enjoyed an excellent credit rating and banks competed to lend the organization money. When SPP began a major project, it borrowed the money needed and spread out the cost in a manner that benefitted the existing members.

“It’s a basic policy that the finance committee arrived at very early on,” Skilton said. “We did not want to hit everybody with the full cost of the market in the first year. It wouldn't be fair to existing members if a new member came in and [the existing members] had already paid for the market. The new members would then have the benefits of the market without paying in unless we got into lessee negotiations.

“We call that ‘generational equity.’ Basically, that means that we want everybody to pay their fair share during the period that they use the particular asset.

“For the market, we borrowed the money for seven years on the expectation that the market would still be good and serviceable over those seven years. That’s a basic concept for us, and the banks bought in.”

**COMMITTED TO EDUCATION AND TRAINING**

SPP invested heavily in training and education at all levels of the organization — from learning initiatives for staff to customer training to supporting education for the next generation of technical staff.

**CAREER DEVELOPMENT**

SPP encouraged staff members to become continuous learners by providing professional development opportunities, job training and tuition assistance.

The company had a leadership training program for all new supervisory staff and employees identified by their supervisors as having leadership potential. As of 2015, 297 employees had graduated from the program since its inception in 2006.

Employees could take advantage of the SPP career development program — a framework that defined career paths and set expectations and objectives for each step along those paths.
SPP defined foundational competencies that every employee was expected to demonstrate: accountability, communication, compliance, continuous improvement, planning and organization, relationship-building and teamwork. The career development model layered individual development in needed areas on top of the core competencies.

SPP also had an 18-month, engineer-in-training program for highly qualified graduates of Bachelor of Science programs in electrical engineering.

CUSTOMER TRAINING

SPP remained committed to providing a variety of training opportunities for its members, including:
- Regional system restoration drills
- Integrated Marketplace training
- Regional emergency operations training
- Train-the-trainer classes

Just for the Integrated Marketplace, the training department offered four levels of classes ranging from a general introduction to the marketplace to in-depth topics tailored for market participants.

In 2015, the customer training department provided members 847 classroom hours of training opportunities through which stakeholders received a total of 26,795 hours of training. Participants received more than 21,136 NERC continuing-education credits for credential maintenance and logged 4,489 hours of simulation training.

Much of the training used Internet conferences and self-study courses available through the SPP Learning Center. Between 2010 and 2016, registration for the Learning Center grew from 501 people to 3,974.

EDUCATIONAL OUTREACH

Recognizing the electric utility industry faced a shortage of electrical engineers degreed in power systems and planning, SPP partnered with the University of Arkansas at Little Rock (UALR) to create educational opportunities in 2006.
SPP donated $95,000 to UALR to establish the Southwest Power Pool Power Systems Laboratory. The Electric Cooperatives of Arkansas also contributed $5,000 to the project. The Power Systems lab consisted of four motor generator sets that allowed students to get hands-on experience by generating power and loading it into a grid.

SPP also developed a Power System Design and Analysis course with UALR, which is directly related to SPP’s core electrical engineering need.

#ARKIDSCANCODE

In 2015, Arkansas became the first state to pass a law requiring that coding be taught in every high school through an Essentials of Computer Programming course. Gov. Asa Hutchinson led the effort and launched the hashtag #arkidscancode to advance the campaign on social media.

In February 2016, SPP hosted more than 150 students from 14 school districts who were participating in the course taught by the Arkansas School for Mathematics, Sciences and the Arts. Representatives from SPP’s engineering, IT and operations departments
demonstrated how algorithms and other programming tools help them monitor the grid, collect and analyze data from 94 member companies and ensure the reliable supply of electricity to nearly 18 million people.

The Marion School District News reported: “Students learned how coding and programming is used to ‘keep the lights on.’ Students also learned about where to start with the basic languages of coding. The professionals at SPP highly recommended learning Java as one of the first two or three languages because of its versatility and widespread use across the world. This was exciting for our students because we have been working on Java for the majority of the year, and many of the speakers pointed out that it only takes some basic coding knowledge to build simple programs that help analyze data and provide solutions.”

**PROACTIVE ON LEGISLATION AND POLICY ISSUES**

SPP has a long history of providing testimony and educating legislators, regulators and government agencies about the electric grid and wholesale electric markets, as well as the challenges and opportunities facing the electric industry.

In 2013, the organization formalized its efforts by creating the government affairs and public relations department.

Mike Ross, who served six terms in the U.S. House of Representatives and served on the House Energy and Commerce Committee and its Energy Subcommittee, was selected as SPP’s senior vice president for government affairs and public relations.

The department launched an educational outreach initiative to educate state and federal elected officials and government agencies on SPP’s role as a Regional Transmission Organization.

In 2015, SPP hosted its first Government Affairs Conference in Washington, DC for government affairs representatives from member companies. The group heard from key
members of the U.S. Congress on energy-related issues, FERC commissioners and representatives from the Environmental Protection Agency.

Additionally, the department spends significant time researching, tracking and developing SPP’s response to proposed, pending and enacted legislation and rulemaking at the federal and state level.

EVER VIGILANT

“The biggest challenge we’re facing is cybersecurity,” Carl Monroe said. “There are two main purposes for cyber maliciousness. One is to get some information from you that will help them make money and the other is to disrupt society.

“We’re considered a critical infrastructure of the United States. Part of our challenge is to [protect the grid] in a changing environment where the technology is changing, where the tactics are changing, and where the threats are changing in that environment.”

SPP Executive Director of Interregional Affairs Charles Yeung, NERC Vice President of Standards and Compliance Ken McIntyre, and SPP Vice President, Chief Compliance and Administrative Officer Michael Desselle at a North Amerian Energy Standards Board (NAESB) Board of Directors meeting in Houston, Texas.
FERC revised its seven critical infrastructure protection (CIP) reliability standards in July 2015 as part of an ongoing program to update standards to ensure the protection of the grid.

“The CIP standards have absolutely had the single largest impact in IT of all the standards that the company must comply with because they dictate how you’re going to protect those systems that are needed to ensure the bulk reliable grid,” Barbara Sugg explained.

“Those standards have been evolving to become more and more refined and meaningful and valuable,” she added. “This latest version is probably the single largest change to them in more than five years. Every couple of years they produce a new version and the changes are incremental. This one is significant.”

Keeping the grid secure required enhanced security metrics, advanced security monitoring tools, rigorous incident-response exercises and improved processes.

“Above all things, we must be secure,” Sugg said.
Conclusion: SPP Today and In the Future

President and CEO Nick Brown often recounts to his colleagues and staff his single takeaway from an introductory college physics course: Nothing ever stays the same. The principle is true of the company Brown still leads in 2016. As SPP enters its 75th year of existence, its continued evolution to meet the changing needs of the electric utility industry and the customers it serves is evident.

NEW BOARD MEMBERS

In January 2016, SPP’s board of directors expanded their roster. Graham Edwards of Isle of Palms, South Carolina and Bruce Scherr of Palm Beach Gardens, Florida joined the board, which grew from seven independent directors to nine.

The decision to expand the board was made with an eye on the future. Acknowledging that some existing, long-tenured board members will retire in the next several years, SPP’s stakeholders supported the idea of bringing new directors onboard to get them up to speed and facilitate a smooth transition when the time comes.

“On behalf of our board, I am very pleased to welcome Graham and Bruce,” said Nick Brown in a statement issued following the new directors’ election. “Graham has a distinguished career in public power and considerable knowledge of our industry from his service on the board and as the chief executive of the Midcontinent Independent System Operator...
Bruce expertly served for more than a decade on the board of the North American Electric Reliability Corporation (NERC) and has extensive compliance and critical infrastructure protection experience.

THE VALUE OF TRANSMISSION

In the same month, SPP published a first-of-its-kind study quantifying the benefits of transmission investments in its region.

Previous studies by SPP and others in the industry relied on projections of expected future value of transmission construction based on available forecast data. The Value of Transmission study used actual historical operating data obtained during the first year of operation of SPP’s Integrated Marketplace to document transmission value already realized.

“The SPP Value of Transmission study is a path-breaking effort,” noted Johannes Pfeifenberger, Judy Chang and Onur Aydin of the Brattle Group in a letter accompanying the study. Compared to transmission planning studies, “it provides a more accurate estimate of the total benefits that a more robust and flexible transmission infrastructure provides to power marketers, market participants and, ultimately, retail electric customers.”

Analyzing 348 transmission upgrades built in the SPP region from 2012 to 2014 which represented capital investments of almost $3.4 billion, the study found that the upgrades resulted in more than $240 million in fuel cost savings alone for utilities during the first year of operation of the company’s wholesale energy market.

In addition to fuel cost savings, the study quantified benefits including reliability and resource adequacy benefits, generation capacity cost savings, reduced transmission losses, increased wheeling revenues and public policy benefits associated with more optimal wind development facilitated by the transmission upgrades.

The net present value of all quantified benefits was calculated to exceed $16.6 billion over a 40-year period, resulting in a benefit-to-cost ratio of at least 3.5-to-1. In other words, investments are expected to produce more than $3.50 in overall benefits for every $1 in transmission-related costs.

The Brattle Group letter added: “the estimated present value of the production cost savings in the SPP study likely is understated” due to several factors, including the fact that many of the major transmission projects evaluated were not yet in service during most of the period analyzed.
The Value of Transmission study validated what industry experts had long claimed but struggled to prove, that transmission construction and grid modernization is an investment, not just a cost.

ORDER 1000

Just a few months later SPP reached another significant milestone, successfully meeting the requirements of FERC Order 1000, which required certain transmission projects to be competitively bid. In response to the order, SPP developed a selection process under which the company competitively solicited proposals for approved projects.


The report’s issuance marked the completion of years of work to comply with Order 1000. SPP stakeholders developed and FERC approved the Transmission Owner Selection Process; SPP’s Competitive Transmission Process Task Force standardized a request for proposal process; and the IEP reviewed, assessed, scored and ranked 11 competitive proposals based on the requirements of the SPP tariff.

The report was “a significant milestone that demonstrates the effectiveness of SPP’s stakeholder process,” said Paul Suskie, executive vice president of regulatory policy and general counsel. “We’ve successfully met the requirements of FERC Order 1000 while balancing the confidentiality and equity inherent to a competitive process with our own organization’s values of collaboration, efficiency and transparency.”

Two weeks later, at the April 26, 2016 board of directors meeting, the board accepted the recommendation of the IEP, naming Mid-Kansas Electric Company the transmission owner responsible for construction of the Walkemeyer project.

PLANNING RESERVE MARGINS LOWERED

Also, on April 26, 2016, the board approved the reduction of SPP’s planning reserve margin — the amount of generating capacity each load-serving entity in SPP’s region has to maintain above their projected demands — from 13.6 percent to 12 percent, lowering capacity requirements in SPP by about 900 MW. The reduction was expected to save the organization’s load-serving members approximately $90 million annually.
Vice President of Engineering Lanny Nickell cited three primary factors that enabled SPP to take this cost-saving step while maintaining reliability: significant transmission build-out — nearly $6 billion in the last decade — that allowed the RTO to deliver resources from any part of its footprint to wherever they’re needed; geographic diversity, magnified by the expansion of SPP’s service territory into all or part of 14 states as of October 2015; and the success of SPP’s markets, which integrated more than 700 generating resources into the organization’s capacity mix.

“This action greatly illustrates the power of our stakeholder process,” Nickell said in a press release. “Our staff and stakeholders worked together diligently to assess and confirm the feasibility and benefits of lowering our reserve margin, and thanks to their consensus-building efforts, our entire region will now benefit from improved reliability and capacity savings.”

THE VALUE OF SPP

An SPP study completed in early 2016 determined that, as a result of the services provided by the company, SPP’s members received net benefits of more than $1.4 billion annually at a benefit-to-cost ratio of more than 10-to-1. For the typical end-use customer using 1,000 kWh per month, this means a $100 electric bill would be $105.65 without the services SPP provides.

THE NEXT 25 YEARS

Member-driven, relationship-based, evolutionary not revolutionary, recognition that reliability and economics are inseparable and independence through diversity — these core ideas continue to guide SPP in an ever-changing landscape.

The future of SPP will hinge on the organization’s ability to remain flexible and collaborative as it navigates in the regulatory arena. In December 2015, Scott Hempling, author of “Regulating Public Utility Performance: The Law of Market Structure, Pricing and Jurisdiction,” wrote an essay titled “Is Regulatory Conflict Inevitable?: A Seasonal Plea for Peace.”

In that essay, Hempling touched on many of the issues facing the electric utility industry when he wrote:

Industry conflicts are getting worse: Thirty years ago, regulatory conflict was contained: Municipal wholesale power systems fought incumbent utilities over access to generation and transmission; retail ratepayers fought
shareholders over rate increases. In the ensuing three decades, regulatory maturation has solved some of these problems, with rules and procedures that make them more susceptible to settlement.

Yet today, new conflicts flare nearly everywhere. In the Supreme Court this year, demand resource providers are fighting generators over access to regional power supply markets, while New Jersey and Maryland are fighting generating companies over the states’ wholesale price supports. In the courts of appeals, carbon emitters are (or will be) fighting the EPA’s Clean Power Plan; Internet highway owners are fighting content providers over the FCC’s net neutrality initiatives; incumbent transmission owners are fighting new transmission providers and FERC over FERC’s removal of the incumbents’ “right of first refusal” to build regional transmission facilities; and states are still fighting each other over transmission cost allocation. Before state commissions and state legislatures, solar companies are fighting incumbent utilities over costs avoided and incurred, while communities are fighting their local water companies when toxic waste penetrates their water systems.

Those conflicts are the ones above the surface — pending in courts and commissions and legislatures. They are the ones rooted in the friction between old statutes and new values, between old market structures and new technologies. Then there are the deeper conflicts, ones at the intersection of regulation and politics. Consider: Incumbent utilities want the security of a monopoly franchise, along with the financial assurances that their investments will be profitable. Consumers want low rates and high-quality service, along with tools to reduce their century-long dependency on the incumbents. Non-utility competitors want market entry and competitive success.

And there’s more. Technology innovators want access to the interoperability ‘codes’ so they can mesh new technologies with old world infrastructure. Labor wants sustained employment and solid pensions.

SPP THEN AND NOW: STRATEGIC PLANNING

During 2003 — when SPP stood at the crossroads about the organization’s future — the board of directors formed the Strategic Planning Task Force (SPTF) to review the organization from top to bottom and make recommendations on how to proceed.

The insights gained from this process prompted the board to reorganize the SPTF into the permanent Strategic Planning Committee (SPC).

Today, the SPC meets regularly to look at trends that will affect the industry, work with various task forces to address opportunities and challenges and make recommendations for how SPP should proceed.
Environmentalists want emissions reduced and emitting infrastructure replaced. (And the environmentalist community gets fractured further, since wind can displace coal but turbine blades kill birds.) Industrial customers want rates lowered so they can compete with overseas firms...

Many things will influence the future of SPP, but many members and staff note four key areas:

- Shifts in national energy and environmental policies
- Growth in renewable and new energy resources
- Development of smart devices and new consumer technology
- Aging transmission infrastructure

SHifting National Priorities

National policy regarding generation sources continues to evolve in response to changing circumstances. In the 1970s, the government pushed for utilities to develop nuclear power as a generation source to decrease U.S. dependence on foreign oil as a response to the Arab oil embargo.

The Three Mile Island accident shifted the national focus to safety issues, which caused the cost of developing nuclear plants to skyrocket, and policymakers encouraged developing more coal-fired plants as the solution.

It was during the 1970s that electric generation from natural gas was banned. And in 2015, the EPA adopted rules to reduce carbon emissions, which will lead to less generation from coal.

Unlike in the past, though, the industry today must respond to changing attitudes and priorities in a much different context.

“As a result of the internet and social media, people are more informed than ever before,” said Mike Ross, SPP’s senior vice president of government affairs and public relations. “They’re demanding cleaner energy. They want more consumer choices. They are challenging the siting of electrical transmission lines and generation units. This pressure point between those who make and move power and those who consume it should improve in the years ahead. That’s because those in the electricity business and policy makers are listening to them. And new technologies and efficiencies will make it possible to address their growing concerns.”
In 2016, the federal push focuses on environmental issues and reducing carbon-dioxide emissions from electrical power generation. In August 2015, President Barack Obama unveiled the final version of the Clean Power Plan, the first policy to set a national limit on carbon pollution produced by power plants. The plan calls for a 32 percent reduction of carbon dioxide emissions from electrical power generation by 2030.

The plan focuses on reducing emissions from coal-burning power plants as well as increasing the use of renewable energy such as wind and solar power.

“Environmental regulations, or the threat of them, will continue to have an impact,” Paul Suskie said. “The Clean Power Plan may never get implemented, but we’re already seeing impacts today.”

“Coal is dead,” proclaimed Jake Langthorn from Oklahoma Gas and Electric. “We’re going to see renewable resources become omnipresent; they’re nearly there now. OG&E has about a 7,000 megawatt system [usage] peak. Sometime in 2016 or 2017, the peak capacity of the wind on the OG&E system will be greater than our system peak.”

“I like to describe the future as not one of providing electricity,” Langthorn said. “I work for a transmission owner and a generator owner … an integrated utility. We think of ourselves as providing electricity, and I think we’re going to have to change that view in the future.

“What OG&E (with SPP) provides is reliability. It’s the only thing that will separate us from people who can provide their own. If they put a battery in their house and a solar system, the potential exists to provide all their needs from their own resources. What they can’t provide is reliability. You can’t store enough energy to outlast four days of no sunshine.

**FROM COAL TO WIND — FINDING THE RIGHT MIX**

Understanding the issues surrounding generation mix requires understanding the nature of the various energy sources.

The nation’s electric grid currently is driven primarily by coal, Paul Suskie said.

“The grid was built assuming these coal plants run 24/7 for 10 months out of the year,” Suskie explained. “And so, they were the stabilizing force in electric power flows. You take them out and replace them with wind that goes up and down [in output] — it creates various issues on the grid.”

Wind and solar power sources cannot be summoned on demand — the wind may not blow; the sun may not shine — which means SPP has to have other energy sources available to start up on short notice — and coal isn’t a good choice for that type of system.

“You can’t just turn off all these big coal plants one day and turn them on again the next,” Dave Christiano said.

“Coal plants are like a fire in your fireplace,” Suskie said. They take time to start up and you can’t just turn them off quickly because the coal continues to burn.
“Utilities will be in the position of going to … a distribution system that no longer functions as a one-way device (that is, from the supplier to the consumer), but where the consumer, through their own resources contributing to the grid, is a significant contributor to both the energy resources and to the reliability.

“But, somebody has to coordinate it. Somebody has to be there to fill all the chinks, and the bits, and the pieces, and the gaps and the holes. That’s what we can do. And, that will be a significant change of philosophy.”

Other influences on the national level could dramatically expand SPP’s role in the energy markets.

“We’ll continue to see natural gas as a predominant fuel for base load generation in our footprint, and because of that, the coordination with the electric industry and natural gas industry is going to continue to be important,” said SPP vice president for process integrity and chief administrative officer Michael Desselle. “One of the [FERC] chairman’s top priorities is getting natural gas and electricity much more harmonized.”

“I could foresee us in the next 25 years providing these same kind of services we do for the electric industry for the natural gas industry,” he continued. “We’ll be able to give price transparency and open access to the natural gas that will be flowing across pipelines in North America.”

GROWTH IN RENEWABLE ENERGY SOURCES

In 2016, SPP’s serves more than 18 million people in a territory that covers almost 575,000 square miles. The footprint cuts a swath down the middle of the United States — stretching from the Canadian border down into Texas and Louisiana and encompassing all or part of 14 states.

Geographically speaking, SPP holds a key position for the future of renewable energy sources such as wind and solar.

“SPP’s wind potential is staggering, especially now, because [our footprint has] expanded all the way to Canada,” Dave Christiano said.

But, he is quick to acknowledge that building transmission remains a problem. “The big problem is that the lines just don’t exist yet,” he said. “The integration is a particular
challenge of how you can control the system and then how you’re going to deal with this massive amount of wind.”

Lanny Nickell also suggested that the next 25 years would see a significant change in the country’s resource mix.

“Renewables will continue to grow,” Nickell said, “with solar generation and battery storage being a much bigger part of the mix. By 2041, I expect over 50 percent of the SPP’s annual energy consumption will be comprised of renewables. SPP will be a major supplier of both utility-scale solar and wind energy to both the Eastern and Western Interconnections.”

As a Regional Transmission Organization, SPP dispatches energy reliably and economically, regardless of its fuel source.

“We’re agnostic as to what the generating resources are,” Desselle explained. “We want to ensure that the industry has time to build the transmission that’s necessary because it takes seven to eight years at least to get a project from the time it’s approved in place. So it could be anywhere from seven to 10 years to get transmission built and in place to accommodate significant changes in generation and how to supply our need in the footprint.”

Looking to the future, Desselle said he thinks SPP could be a key to moving electricity across the nation.

“We’re right down the middle of the country, and we’re situated where all this wind and solar-rich resources are and are likely to be,” Desselle said. “We’re sitting in a great spot to transmit that power in either direction. In 25 years we might be a hub for transportation for renewable resources.”

**CONFLUENCE: WHEN EVERYTHING COMES TOGETHER**

Individual initiatives by SPP have provided many benefits to its members (and ultimately to consumers), but sometimes a group of changes in different areas created bonus benefits.

In April 2016, the board of directors approved lowering SPP’s planning reserve margin from 13.6 percent to 12 percent.

This move lowered capacity requirements by about 900 megawatts, which is expected to save $90 million annually.

SPP cited three primary factors that made this change feasible while maintaining its reliability standards:

- The almost $6 billion of transmission buildout that allowed SPP to better deliver energy from any part of its footprint
- Growth of the footprint, which brought expanded resources into the pool
- The success of SPP’s market operations, which integrated more than 700 generating resources into the organization’s capacity mix.

In the future, some combination of transmission expansion, demand-side management, and energy-storage systems may result in additional serendipity benefits for members.
“SPP needs to determine whether the region wants to be self-contained or if we want to be the engine that drives the development of renewables and delivers renewables to the balance of the country,” Noman Williams with South Central MCN said. “And, do we want to take that step in faith and build the infrastructure to support that and then get the value of that brought back to the stakeholders?”

**SMART CONSUMERS AND SMART DEVICES**

Technological advances in the consumer market will drive change in the wholesale electric market as distributed generation (consumers generating their own power), home battery storage systems, smart devices/smart meters, electric cars and other advances penetrate the market.

“For all the challenges SPP faces as an RTO today,” said Bruce Rew, “25 years from now the challenges will be even greater! Operationally we’ll be working to maximize the use of transmission and generation assets, pushing systems to the limit. The ability to move towards a levelized load factor, shifting load not only within a day but throughout the entire year will be essential, and it will be done with enhanced short-term and long-term storage of energy and proper market signals.

“Transmission systems will provide instantaneous information to allow for maximum use. Operating the grid reliably will require the ability to decipher, analyze and send back large amounts of data to provide real-time information. Market participants and consumers will receive data to incentivize favorable behavior. Keeping the lights on will be even more important in the future than it is today.”

**SMART TECHNOLOGY**

Kevin Ashton is credited with coining the phrase “Internet of Things” (often referred to as the “IoT”) in 1999. It describes a network of physical objects that incorporate electronics, sensors and software to communicate with each other.

Today, companies offer consumers a wide array of “smart” devices — everything from GPS-based devices that turn on the lights and adjust the thermostat when your vehicle comes within a certain range of your home to hub-based systems that allow appliances and other smart devices to communicate with each other.

If these devices are connected to a smart grid, they can help manage demand by coordinating usage. For example, in an integrated home, the appliances would be interconnected
through a communication hub and the refrigerator would “know” to wait until the air conditioner was not running to kick on its compressor.

More complex systems would use IFTTT (If This, Then That) programming to monitor and adjust based on logical reasoning. For example, a system might include sensors that measure outdoor and indoor temperature and adjust a smart thermostat accordingly. If the thermostat activates the air conditioning to cool the room, it might communicate with the controller attached to the blinds to shut all blinds on the sunny side of the house.

“I expect consumers will be much more sophisticated in how and when they use electricity,” Lanny Nickell said. “That sophistication, combined with both utility-scale and distributed development of renewables will drastically change load patterns. And although I expect more homeowners to develop stand-alone supply solutions, utilities will also become more creative and will effectively compete to provide utility-scale clean energy solutions.

“I think our wholesale prices will ultimately be fed into devices in homes that are integrated with time-of-use rates,” Nick Brown said. For example, washing machines and dishwashers would monitor the current rates through a smart grid and turn themselves on during nonpeak (lower rate) periods.

As part of the move to smart grids and smart appliances, Brown sees a future in which the utility companies become active in installing smart technology in their customers’ homes — “utilities investing and installing that technology in homes and earning a rate of return on that as a power provider. That is, earning a return on managing energy, rather than just getting money on what flows through a meter as consumption,” Brown explained.

Smart-grid technology and evolving retail rate structure will empower consumers to use electricity more efficiently — resulting in lower energy bills and less peak demand.

**ELECTRIC CARS AND BATTERY STORAGE**

Although electric cars represent a tiny portion of all car sales, the market is growing. InsideEVs.com reported approximately 119,710 plug-in vehicles were sold in the U.S. in 2014 — a 23 percent jump from 2013 and a 128 percent jump from 2012.

Tesla Motors pioneered the electric car market when it began selling the Tesla Roadster in 2008 — the first highway-capable, all-electric vehicle in serial production in the U.S. This car could travel 200 miles on a single charge. Today, car manufacturers offer more than...
25 different electric-car models (at significantly lower prices than the $30,000 Tesla Roadster) with ranges of 40-100 miles per charge.

A 2014 study by Opower, a firm that uses software and behavioral science to help utilities promote energy conservation, showed electric-vehicle owners enrolled in “time-of-use” pricing programs adapted their usage patterns to charge their vehicles late at night when demand was at its lowest. As the electric-car market matures, this trend could mean greater demand for power at night — when normal load demand is lower and wind generation is (often) at its highest.

Another potential use for the electric car is as an energy-storage device.

“Tesla is actually a company that pretty much was a battery company — an energy storage company, who decided let’s build an electric car,” Dave Christiano said. “Now Tesla is saying, hmmm we’ve got this car that’s sitting around, and we could use that car to actually act as an energy storage device. If the consumer has enough incentive, it will work.”

Tesla isn’t the only company with this idea. Honda unveiled the Power Exporter 9000 in 2015 — an external power-feeding device that enables AC power output from a fuel-cell vehicle — with a maximum output of 9 kW.

Additionally, many companies are developing batteries that allow consumers to store energy generated from solar units.

“In addition, that battery in the car or in the house can help us balance load and generation more efficiently than what we do today,” Brown said. “Today, we assume load is this random event — I turn on a light or the air compressor kicks on or computer comes on — and we chase it with generation. So, we have these big huge generators, and we’re constantly sensing frequency.

“If frequency is high, then we’ve got too much generation. If frequency is low then we don’t have enough generation. So load changes, and we chase it. We send a signal to the generator and say open a valve and send more electricity — we’re constantly moving these big thermal machines. A battery we could tell instantaneously to quit charging, or we can tell it to discharge. We can control that load. There’s tremendous opportunity in that realm.”

Widespread adoption of residential solar-power and storage systems, electric vehicles and smart meters will change usage patterns — not only how much electricity consumers draw from the grid, but when they will draw it.
“By the time SPP turns 100, we will see many more technological advancements,” said Mike Ross. “Many of those advancements are already being developed or implemented, but they’ll continue to grow and become the norm. We’ll see an increase in renewables like wind and solar, energy storage — which will allow a greater percentage of generation to come from renewables — micro grids, distributed generation and demand response. We will continue to see new advancements in transmission, like AEP’s BOLD initiative, allowing smaller structures carrying greater loads with less losses to be built in existing right of ways. We will continue to see more companies getting into the energy space, like Tesla, Google and Apple.

“I believe the next 25 years will be an exciting time to be in the industry as we continue to deliver affordable, reliable and even cleaner energy,” Ross concluded.

AGING INFRASTRUCTURE

Amidst the changes in national priorities, renewable energy sources, and demand-side technology, the electric utility industry will also have to address the challenges of aging transmission infrastructure and the risks that go along with it.

“Our nation’s transmission infrastructure needs to be upgraded due to aging of existing facilities,” Lanny Nickell said, noting that the nation’s transmission system must evolve in step with ever-changing demand patterns. “Billions of dollars in transmission upgrades will be needed in SPP, not only to meet changing use of electricity but even more so just to replace aging infrastructure.”

“Aging infrastructure provides both an opportunity and a challenge for grid operators like SPP,” said Jay Caspary, SPP’s director of research, development, and tariff studies. “As we look toward SPP’s centennial anniversary, the identification of key transmission corridors needs to be a priority to improve grid efficiencies and the effectiveness of bulk power markets.”

Caspary cited a study funded by the U.S. Department of Energy (DOE) to take place in 2016 and 2017 with leadership from the National Renewable Energy Laboratory (NREL). “We’re fortunate to have the DOE funding an Interconnection Seams Study to help us identify the merits of a modernized and optimized seam between SPP and neighboring systems in the Western Electricity Coordinating Council. Support by our members at the Western Area Power Administration, Basin Electric, Tri-State, and Xcel Energy/Southwestern Public
Service is critical and appreciated. It’s only through their help that we’re going to be able to move this study beyond analytics into real plans which benefit SPP and our members.”

**BUT. AT THE END OF THE DAY ...**

If the past 75 years is any indication, SPP’s future will be a dynamic one. Certainly it will be influenced by technological advancements, regulatory and public policy developments, and as-yet-unforeseen circumstances.

Regardless what specific challenges and opportunities face SPP in the future, like so many in the last 75 years, they will require a facilitator — someone to build consensus among the varied interests that emerge during times of change.

SPP has demonstrated through decades of success that it is built to stand the test of time. The company has succeeded in accomplishing its mission while simultaneously expanding its membership and footprint to include all or part of 14 states and its duties to include real-time and next-day energy markets, a consolidated Balancing Authority and more.

As SPP has done in the past, it will continue to provide exceptional value and services to its members in ever-changing circumstances as our industry continues to evolve.

“I think this organization is going to be around for a long time,” Steve Gaw said. “It’s going to grow in importance, and it’s going to get better at what it does as it learns and moves forward. That’s its track record.”

The relationships SPP has forged and maintained over the last 75 years not only serve as a testament to the integrity and strength of its business model, but also as a foundation on which to build the next step in SPP’s evolution. Its driving force, which will see it successfully through whatever challenges and opportunities come its way, will remain its culture and collaborative relationships that bind its stakeholders together.
Appendix

SPP MILESTONES

1941  SPP Founded
1968  Became NERC Regional Council
1980  Implemented telecommunications network
1991  Implemented operating reserve sharing
1994  Incorporated as non-profit
1997  Implemented reliability coordination
1998  Implemented tariff administration
2001  Implemented regional scheduling
2004  Became FERC-approved Regional Transmission Organization
2006  Implemented contract services
2007  Launched EIS market, became NERC Regional Entity
2009  Integrated Nebraska utilities
2010  FERC approved Highway/Byway cost allocation methodology and Integrated
       Transmission Planning Process
2012  Moved to new Corporate Center
2014  Launched Integrated Marketplace
2014  Became the regional Balancing Authority
2015  Integrated System joined SPP
SOUTHWEST POWER POOL
OPERATING COMMITTEE MEETING
LITTLE ROCK, ARKANSAS
THURSDAY, NOV. 30, 1941

Cecil S. Lynch: President
M. J. Thrasher: Acting Secretary

The first business considered by the Committee was the required qualifications for the personnel of the Consulting Staff.

The qualifications of a number of prospects for each of the positions on the Consulting Staff were discussed. The Committee authorized the chairman, Mr. Lynch, to arrange interviews with the following prospects and employ:

- Coordinating Engineer
  George Mills, Central Power & Light Company
  Corpus Christi, Texas

- Electrical Engineer
  E. L. George, Ebasco Services Inc., New York
  Paul Galby, Springfield, Illinois.

- Mechanical Engineer
  H. W. Page, Ebasco Services Inc., New York

- Accounting Engineer
  Chas. Custer, Arkansas Utilities Commission

The chairman has the privilege of calling on any other members of the Committee to be present during the interviews.

It was agreed by the Operating Committee that the headquarters for the Consulting Staff will be at the Woodward Substation of the Arkansas Power & Light Company, near Pine Bluff, Arkansas, which is now the dispatching headquarters and terminal of communication lines of the Arkansas Power & Light Company.

The next meeting of the Operating Committee will be held at the office of the Texas Power & Light Company, Interurban Building, Dallas, Texas, subject to call by the Chairman of the Committee.

The Operating Committee authorized the preparation of data and the carrying out of a calculating board study to include the systems of all companies in the Power Pool.

The Operating Committee selected Mr. R. S. Pierce to coordinate the work of assembling data and arranging for calculating board reservations. All system data for this study are to be assembled by individual companies and forwarded to:

- Mr. G. S. Lynch, Chairman Operating Committee
  c/o Arkansas Power & Light Company
  Pine Bluff, Arkansas

All correspondence relating to the system study and Operating Committee matters will be addressed to Mr. Lynch at the same address. Correspondence to companies of the Power Pool involving matters relating to the Operating Committee, will be addressed to the company member of the Operating Committee.

Mr. Pierce was requested to prepare a memorandum outlining the objectives of the study and an outline of the work to be done. This memorandum will be sent to all companies cooperating in the study. A preliminary meeting of engineers participating in the study will be held at Ebasco Services Incorporated's offices in New York, January 26, 27 and 28, to check preparation of data and outline final plans and procedure for the study. This study is scheduled to begin February 2, 1942 and is to be made on the General Electric Company network analyzer at Schenectady, New York.

The subject of obtaining priorities for materials required by participating companies for the construction required in establishing this power pool was discussed. It was agreed that a uniform procedure should be used in all requests for all priority ratings and that all applications for priorities pertaining to this project shall be sent to Mr. Lynch, and that all applications from the several companies will be sent in together so that they will be acted upon at the same time. Copies of the approved letter to be used with each application will be sent to members of the Power Pool at once. Copies of a map showing the proposed interconnection are to be furnished all companies to be used with their project applications.

The Operating Committee authorized Mr. R. K. Pierce to secure the cooperation of an engineer from the Leards & Northrup Company and with him visit each operating company and work out details of control and telemeasuring equipment required by each company. After details are worked out, cost estimates and an outline of equipment required will be submitted to the Operating Committee for approval.
### ATTENDANCE AT OPERATING COMMITTEE MEETING - DECEMBER 30 1941 -

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<tr>
<td>Frank N. Milhess</td>
<td>Southwestern Gas &amp; Electric Company</td>
</tr>
</tbody>
</table>

### ENGINEERS WHO WILL PARTICIPATE IN CALCULATING BOARD STUDY

- Arkansas Power & Light Company
- Texas Power & Light Company
- Oklahoma Gas & Electric Company
- Kansas Gas & Electric Company
- Louisiana Power & Light Company
- Mississippi Power & Light Company
- Southwestern Gas & Electric Company
- Empire District Electric Company
- Nebraska Power Company
- Public Service of Oklahoma
- Southwestern Light & Power Company
- Texas Electric Service Company

Copy
SPP LOGOS OVER THE YEARS

Original design on company letterhead

Circa 1980s

SOUTHWEST POWER POOL

1990

Our 50th Anniversary logo (1991)
Our 65th Anniversary logo (2006)

Our logo since 2012

Our 75th Anniversary edition
MISSION/VISION/VALUE STATEMENTS

Mission statement: Helping our members work together to keep the lights on today and in the future.

THE VISION

Major on-going changes affecting electric reliability surround our electric utility industry, including:

- Increasing competitive nature of the electric business which places operating demands upon the bulk electric system for which it was not designed.
- More complicated requirements being placed on those who operate and plan the network as the number of nontraditional player’s increases.
- Requirements for increased (or a higher level of) coordination in regional operation and planning as investments for the future are made.
- The demand for consistently applied reliability standards, guidelines, or criteria that makes certain nothing occurs or is planned that unreasonably impairs the continued reliability of the bulk electric system.
- The necessity for timely and fair resolution of disputes through a mutually agreed upon forum that is part of the electric industry infrastructure.
- The increased need for timely and accurate exchange of operating information.

PRINCIPLES

- Membership in SPP is voluntary and open to any electric utility or any other persons generating electric energy for sale or resale.
- SPP is the authority on electric system reliability in the geographic area served by its members.
- Pool reliability standards, guidelines or criteria must be established and approved by SPP.
- By joining SPP, members agree to conformance to approved SPP and NERC Reliability Criteria and Operating Guides.
- Conformance to these standards, guidelines or criteria will be assured through an active regional monitoring effort.
- Sharing of information in a timely manner is essential to the reliability of the bulk electric system.
- SPP facilitates regional joint planning of the bulk electric system.
ACTIONS

To adhere to the Principles of SPP’s Vision, the following actions are required.

- SPP will provide criteria and certify control area operations and planning criteria
- SPP will provide training, and certification of system operators
- SPP collects technical data, analyzes and documents the reliability of the bulk electric system, and publishes these results.
- SPP will provide methods for dispute resolution and member systems agree to use these methods before taking disputes to the courts or regulatory agencies.
- SPP enforces conformance to the SPP Reliability Criteria and the NERC Operating Guides through peer pressure at all management levels.

PROGRAMS

The following SPP programs, under the direction of the Engineering & Operating Committee, provide the framework for implementing the Actions in SPP’s Vision Plan

- Reliability Criteria-These are the basic “rules of the road” for reliable interconnected systems operation and planning and are maintained by the Reliability Criteria Subcommittee
- Control Area Certification, Performance and Security Monitoring, and Operator Training-SPP Performance Subcommittee will review its member control areas to certify that they conform to SPP and NERC Reliability Criteria and Operating Guides. This subcommittee monitors the operation and security of its member control areas to assure their compliance with these criteria and guides and conducts surveys of utility operations. The Operating Subcommittee maintains a region-wide training program for all system operators.
- Assessments and Event Analysis through the SPP Transmission and Planning Subcommittee, SPP analyzes and reports on the reliability of the bulk electric system as planned. The Operating Subcommittee performs short-term analysis immediately preceding the summer and winter peak demand seasons. They also review actual operations following the summer and winter peak demand seasons.

SPP’s Reliability Assessment Subcommittee (RAS) annually analyzes and documents the reliability of planned bulk electric systems, identifying any needed actions to maintain
this reliability. Through the SPP System Interruption Assessment Committee (SIAC), SPP analyzes system disturbances and unusual occurrences for lessons learned.

- Data Collection-SPP staff maintains historical, current, and forecast data on operating conditions such as generating capacity, demand and energy requirements, fuel consumption, and transmission availability. SPP also coordinates the collection of system data used in various regional and national analyses.

**VALUE PROPOSITION – SPP DIFFERENTIATORS**

- Relationship-Based
- Member-Driven
- Independence Through Diversity
- Evolutionary vs. Revolutionary
- Reliability and Economics Inseparable

**SERVICES PROVIDED BY SPP**

- Monitor the grid to maintain electric reliability
- Process requests for use of the transmission grid under a tariff with consistent rates and terms for all participants
- Operate a wholesale energy market
- Ensure that users, owners, and operators of the bulk transmission system are in compliance with federal reliability standards
- Create regional reliability standards
- Plan for future transmission needs
- Facilitate meetings and decision-making processes
## CURRENT SPP MEMBERS

<table>
<thead>
<tr>
<th>SPP Member Company</th>
<th>Date Joined SPP</th>
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<tbody>
<tr>
<td>Acciona Wind Energy USA, LLC</td>
<td>March 6, 2009</td>
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<tr>
<td>American Electric Power</td>
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<tr>
<td>• AEP Oklahoma Transmission Company, Inc.</td>
<td>January 1, 2010</td>
</tr>
<tr>
<td>• Public Service Company of Oklahoma</td>
<td>December 16, 1941</td>
</tr>
<tr>
<td>• AEP Southwestern Transmission Company, Inc.</td>
<td>January 1, 2010</td>
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<tr>
<td>• Southwestern Electric Power Company</td>
<td>December 16, 1941</td>
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<tr>
<td>Arkansas Electric Cooperative Corporation</td>
<td>October 23, 1969</td>
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<td>Basin Electric Power Cooperative</td>
<td>November 10, 2014</td>
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<tr>
<td>Board of Public Utilities of Kansas City, Kansas</td>
<td>October 23, 1969</td>
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<tr>
<td>Boston Energy Trading and Marketing, LLC (fka Edison Mission...)</td>
<td>November 3, 1995</td>
</tr>
<tr>
<td>Calpine Energy Services, L.P.</td>
<td>October 15, 2004</td>
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<tr>
<td>Cargill Power Markets LLC (Heartland Energy Services)</td>
<td>March 20, 1995</td>
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<tr>
<td>Central Power Electric Cooperative, Inc.</td>
<td>October 27, 2015</td>
</tr>
<tr>
<td>Cielo Wind Services, Inc.</td>
<td>April 1, 2013</td>
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<tr>
<td>City of Coffeyville</td>
<td>June 16, 2011</td>
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<tr>
<td>City of Independence, Missouri</td>
<td>October 23, 1969</td>
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<td>City Utilities of Springfield</td>
<td>October 23, 1969</td>
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<tr>
<td>Clarksdale Public Utilities Commission</td>
<td>November 9, 1979</td>
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<td>Cleco Power, LLC</td>
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<td>Corn Belt Power Cooperative</td>
<td>June 10, 2015</td>
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<td>CPV Renewable Energy Company, LLC</td>
<td>April 4, 2012</td>
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<tr>
<td>Dogwood Energy, LLC</td>
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<td>DTE Energy Trading, Inc.</td>
<td>May 31, 2013</td>
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<td>Duke Energy Transmission Holding Company, LLC</td>
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<td>Dynegy Power Marketing, Inc.</td>
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<td>Empire District Electric Company</td>
<td>December 16, 1941</td>
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<td>East River Electric Power Cooperative, Inc.</td>
<td>May 19, 2015</td>
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<td>East Texas Electric Cooperative, Inc.</td>
<td>October 26, 1995</td>
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<tr>
<td>EDP Renewables North America LLC (fka Horizon Wind Energy, LLC)</td>
<td>May 11, 2010</td>
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<tr>
<td>El Paso Marketing Company, LLC</td>
<td>January 14, 2000</td>
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<td>Enel Green Power North America, Inc.</td>
<td>September 20, 2012</td>
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<td>Entergy Asset Management (fka Entergy Power Ventures, LP)</td>
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<tr>
<td>Entergy Services, Inc.</td>
<td>July 11, 2000</td>
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<td>Company Name</td>
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<td>Exelon Generation Company, LLC</td>
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<td>Flat Ridge 2 Wind Energy, LLC</td>
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<td>Grand River Dam Authority</td>
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<td>Harlan Municipal Utilities</td>
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<td>Heartland Consumers Power District</td>
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<tr>
<td>Hunt Transmission Services, LLC</td>
<td>October 16, 2009</td>
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<td>ITC Great Plains, LLC</td>
<td>August 13, 2009</td>
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<td>Kansas City Power &amp; Light Company</td>
<td>October 23, 1958</td>
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<td>Kansas City Power &amp; Light Company (KCP&amp;L Greater Missouri Operations Company)</td>
<td>November 10, 1993</td>
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<td>Kansas Electric Power Cooperative, Inc.</td>
<td>September 29, 1999</td>
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<td>Kansas Municipal Energy Agency</td>
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<td>Kansas Power Pool</td>
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<td>November 9, 1979</td>
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<td>Lea County Electric Cooperative, Inc.</td>
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<td>Lincoln Electric System</td>
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<td>Louisiana Energy and Power Authority</td>
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<td>Luminant Energy Company, LLC (fka TXU Energy Trading Company)</td>
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<td>Mid-Kansas Electric Company, LLC</td>
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<td>Mountrail-Williams Electric Cooperative</td>
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<td>Municipal Energy Agency of Nebraska</td>
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<td>NRG Power Marketing, LLC</td>
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<td>OGE Transmission, LLC</td>
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The Power of Relationships
<table>
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<td>Oklahoma Municipal Power Authority</td>
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<td>Tenaska Power Services Co.</td>
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<td>Transource Missouri, LLC</td>
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<td>Western Area Power Administration-Upper Great Plains Region</td>
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94 Members as of 8/19/2016
SPP FOOTPRINTS

The following lists define SPP’s footprints and list the members, Balancing Authorities (BAs), Transmission Operators (TOPs) and/or Transmission Owners (TOs) in each footprint.

BALANCING AUTHORITY AREA

The Balancing Authority (BA) Area is comprised of those entities who served as BAs before Southwest Power Pool became the region’s Consolidated Balancing Authority. These “legacy” BAs are:

- American Electric Power
- City Utilities of Springfield
- City of Independence Power and Light, Missouri
- Board of Public Utilities, Kansas City, Kansas
- Empire District
- Grand River Dam Authority
- Westar Energy
- Kansas City Power and Light
- KCPL Greater Missouri Operations Company
- Lincoln Electric System
- Midwest Energy
- Nebraska Public Power District
- Oklahoma Gas and Electric
- Omaha Public Power District
- Southwest Public Service
- Sunflower Electric Power Corporation
- Western Farmers Electric Cooperative
- Western Area Power Administration (TOP and pre-Integrated System BA)
INTEGRATED MARKETPLACE REGION

This footprint consists of Transmission Owners (TOs) and other participants in SPP's Integrated Marketplace. Load and generation connected to these TOs' transmission facilities are subject to Integrated Marketplace terms and conditions. (* Financial Only MP)

- Active Power Investments*
- AEP Energy Partners*
- Alliant Energy Corporate Services, Inc.
- American Electric Power West*
- Appian Way Energy Partners Southwest, LLC*
- APX*
- Arkansas Electric Cooperative
- Associated Electric Cooperative, Inc.—Power Market
- ATNV Energy, LP*
- Automated Algorithms*
- Basin Electric Power Cooperative
- BJ Energy*
- Black Hills Power*
- Black Oak Energy LLC*
- Blackout Power Trading*
- Blue Canyon Windpower
- Boston Energy Trading & Marketing*
- BP Energy Company*
- Brookfield Energy Marketing LP*
- Brookfield Renewable Energy Group*
- Buffalo Dunes Wind Project
- Calicot Energy*
- Calpine Energy Services
- Canadian Woods Products*
- Caney River*
- Cargill Power Markets*
- Carpe Diem Trading II*
- Castleton Power Trading, LLC*
- Chisholm View Wind Project
- Cimarron Wind Energy
- Citigroup Energy*
- City of Chanute
- City of Fremont
- City of Grand Island*
- City of Independence, Mo.
- Conoco Phillips*
- CP Bloom Wind
- Darby Energy*
- DC Energy Midwest*
- DC Transco, LLC*
- Dempsey Ridge Wind Farm
- Denver Energy*
- Dogwood Power Management*
- DTE Energy Trading*
- Dufossat Capital VI*
- Dynasty Power*
- E.ON Global Commodities North America*
- East Texas Electric Coop*
- EDF Trading North America*
- EDP Renewable North America*
- eKapital Investments*
- Empire District Electric
- Endurance Energy Midwest LLC*
- ETC Endure Energy*
- Exelon Generation
- Fantods, LLC*
- Flat Ridge 2 Wind Energy
- Franklin Power*
- Freepoint Commodities, LLC*
- Galt Power*
- Golden Spread Electric Cooperative
- Goodwell Wind Project
- Google Energy
- Grand River Dam Authority
- GRG Energy*
- Guzman Energy*
- H.Q. Energy Services US*
- Harlan Municipal Utilities
- Hastings Utilities*
- Heartland Consumers Power District
- High Majestic Wind II
- Iberdola Renewables*
- Inertia Power III*
- J. Aron and Company*
- JP Morgan Ventures*
- Kansas City Board of Public Utilities
- Kansas City Power and Light
- Kansas Municipal Energy Agency
- Kansas Power Pool
- Kentucky Municipal Power Agency*
- Lincoln Electric System
- Little Elk Wind Project
- LM Power*
- Macquarie Energy*
- MAG Energy Solutions*
- Mercuria Energy America*
- Merrill Lynch Commodities*
- MET Southwest Trading*
- MidAmerican Energy Company
- Midwest Energy
- Midwest Energy Trading East*
- Minco Wind
- Minnesota Municipal Power Agency
- Minnkota Power Cooperative, Inc.
- Missouri Joint Municipal
- Missouri River Energy Services
- Montana-Dakota Utilities
- Monterey SW*
- Monterey SWF*
- Morgan Stanley Capital Group*
- Morningstar Commodity Data, Inc*
- Municipal Energy Agency of Nebraska
- NextEra Energy Power Marketing
- NJ Resources
- Noble Americas Gas & Power
- Noble Great Plains Windpark
- Northern States Power
- Northpoint Energy Solutions
- Northstar Trading LTD*
- NorthWestern Corporation dba NorthWestern Energy
- NRG Power Marketing, LLC*
- NSP Energy Marketing*
- NSP Energy Trading*
- Occidental Power Services*
- Oklahoma Gas & Electric Company
- Oklahoma Municipal Power Authority
- Omaha Public Power District
- Oneta Power
- Otter Tail Power Company*
- Parkhurst Resources Power Partners*
- Peninsula Power, LLC*
- Powerex Corp.*
- Public Service Co. of Colorado*
- Public Service Co. of Colorado MISO MP*
- Pure Energy*
- Rainbow Energy Marketing
- Resale Power Group of IOWA
- RPM Access LLC
- Saracen Energy Midwest*
- Seiling Wind LLC
- Sempra Generation*
- SESCO SPP Trading LLC*
- Shell Energy North America
• Smoky Hills Wind Project II
• Solea Energy, LLC*
• Southern Company Services
• Southwestern Public Service
• Sunflower Electric Power
• Sustaining Power Solutions
• SW Power Trading, LLC*
• TEC Energy, Inc.*
• Tenaska Power Services
• Tennessee Valley Authority*
• The Energy Authority
• Tios Capital, LLC*
• TPS1*
• TPS2*
• TPS3*
• TPS4*
• TPS5*
• TPS6*
• TPS7*
• TPS8*
• Trailstone Power*
• TransAlta Energy Marketing (U.S.) Inc.*
• Trumpet Trading LLC*
• Tungsten Power LP*
• Twin Eagle Resource Management*
• Uncia Energy LP–Series D*
• Union Power Partners*
• Utilities Plus*
• Velocity American*
• Vitol*
• Westar Energy
• Western Area Power Administration–Rocky Mountain Region*
• Western Area Power Administration–Upper Great Plains Marketing
• Western Area Power Administration*
• Western Farmers Electric Cooperative
• XO Energy SW*
• XO Energy SW2*

REGIONAL ENTITY

SPP is a Regional Entity (RE) of the North American Electric Reliability Corporation (NERC). The SPP RE ensures a defined area of the bulk electric system is reliable, adequate and secure through compliance and enforcement activities with NERC Reliability Standards.

The SPP RE footprint is comprised of utilities located in the SPP Balancing Authority and in the states of Arkansas, Louisiana, Kansas, Missouri, Texas, Oklahoma, New Mexico, Southwestern Power Administration BA and parts of the MISO BA (including CLECO, LAFA, and LEPA, as well as SPP members located in those areas).

Balancing Authorities in the RE footprint:
• Southwest Power Pool
• Southwestern Power Administration
• MISO
The RTO/tariff footprint is comprised of the Transmission Owners that have committed their transmission facilities to the SPP Open Access Transmission Tariff (OATT).

- American Electric Power West
- AEP West Transmission Companies
- Basin Electric Power Cooperative
- Central Nebraska Public Power and Irrigation District
- City of Pierre, S.D.
- City of Sioux Center, Iowa
- City Utilities of Springfield
- Coffeyville Municipal Light and Power
- Corn Belt Power Cooperative
- Deep East Texas Electric Cooperative
- East River Electric Power Cooperative, Inc.
- East Texas Electric Cooperative
- Empire District Electric
- Grand River Dam Authority
- Harlan Municipal Utilities
- Heartland Consumers Power District
- ITC Great Plains
- Kansas Power Pool
- Kansas City Power and Light
- Lincoln Electric System
- KCP&L Greater Missouri Operations
- Lea County Electric Cooperative
- Mid-Kansas Electric Company
- Midwest Energy
- Missouri River Energy Services
- Moorhead Public Service
- Nebraska Public Power District
- Northwest Iowa Power Cooperative
- NorthWestern Corporation (South Dakota)
- OG&E Electric Services
- Oklahoma Municipal Power Authority
- Omaha Public Power District
- Orange City Municipal Utilities
- Prairie Wind Transmission
- Southwestern Power Administration
- Southwestern Public Service
- Sunflower Electric Power
- Tex-La Electric Cooperative of Texas
- Transource Missouri
- Watertown Municipal Utility Department
- Westar Energy
- Western Area Power Administration—Upper Great Plains
- Western Farmers Electric Cooperative
RELIABILITY COORDINATOR (RC)

The RC footprint is comprised of those Balancing Authorities and Transmission Operators for which SPP acts as a Reliability Coordinator (RC is a NERC designation).

The SPP RC footprint includes the SPP Balancing Authority Area (defined above), SPP Transmission Owners and:

• Corn Belt Power Cooperative
• Southwestern Power Administration, a BA in the Southeastern Electric Reliability Council and the Midwest Reliability Organization
• Tri-State G and T

RESERVE SHARING GROUP

The Reserve Sharing Group footprint is comprised of the SPP BA and certain other BAs who have contracted with SPP to provide them with Reserve Sharing services.

• Associated Electric Cooperative
• Southwestern Power Administration
• Southwest Power Pool
CURRENT BOARD OF DIRECTORS/MEMBERS COMMITTEE

BOARD OF DIRECTORS
Larry Altenbaumer
Phyllis Bernard
Julian Brix
Jim Eckelberger
T. Graham Edwards
Joshua Martin
Bruce Scherr
Harry Skilton

MEMBERS COMMITTEE
Kristy Ashley
Jason Atwood
Philip Crissup
Jon Hansen
Robert Harris
Kelly Harrison
Scott Heidbrink
Duane Highley
David Hudson
Robert Janssen

Thomas Kent
Jeff Knottek
Brett Leopold
Stuart Lowry
David Osburn
Mike Risan
Kevin Smith
Stuart Solomon
Kelly Walters
Michael Wise

HISTORICAL LIST OF THE BOARD CHAIRS

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Term</th>
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<tbody>
<tr>
<td>J. Robert Welsh</td>
<td>SWEPCO</td>
<td>1970</td>
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<tr>
<td>W. A. Parker</td>
<td>OG&amp;E</td>
<td>1971-1973</td>
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<tr>
<td>R.O. Newman</td>
<td>Public Service Co. of Oklahoma</td>
<td>1974</td>
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<td>William McCollam Jr.</td>
<td>New Orleans Public Service</td>
<td>1975</td>
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<tr>
<td>Donald Lutken</td>
<td>Mississippi P&amp;L</td>
<td>1982-1984</td>
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<td>Arthur Doyle</td>
<td>KCPL</td>
<td>1984-1985</td>
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<td>W.R. Esler</td>
<td>SWN Public Service</td>
<td>1986-1987</td>
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<td>John Turk</td>
<td>SWEPCO</td>
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<tr>
<td>Bob Lamb</td>
<td>Empire</td>
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<td>Bill Helton</td>
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<td>Greg Nesbitt</td>
<td>CLECO</td>
<td>1994-1995</td>
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<td>Bob Zemanek</td>
<td>Central &amp; South West Service</td>
<td>1998-1999</td>
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<tr>
<td>Gary Voigt</td>
<td>Arkansas Electric</td>
<td>2000-2001</td>
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<td>OG&amp;E</td>
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<td>Jim Eckelberger</td>
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<td>2004-present</td>
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### HISTORICAL LIST OF BOARD OF DIRECTORS MEMBERS

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<tr>
<th>Name</th>
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<td>Mike Apprill</td>
<td>1994</td>
<td>Tom McDaniel</td>
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<td>David McMillen</td>
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<td>Steven Moore</td>
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<td>Richard Bremmer</td>
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<td>Gregory Nesbitt</td>
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<td>Harvey Padewer</td>
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<td>Mike Palmer</td>
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<td>Dave Christiano</td>
<td>1997</td>
<td>Stephen Parr</td>
<td>2002</td>
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<td>Harry Dawson</td>
<td>2002</td>
<td>Paula Rosput</td>
<td>1997</td>
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<td>Michael Deihl</td>
<td>1997</td>
<td>Gary Roulet</td>
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<td>Patrick Ryan</td>
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<td>Frank Gallaher</td>
<td>1995</td>
<td>Robert Schoenberger</td>
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<td>Michael Gildea</td>
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<td>J.M. Shafer</td>
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<td>James Stanton</td>
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<td>Bill Helton</td>
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<td>Terry Steinbecker</td>
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<td>Doug Henry</td>
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<td>Richard Verret</td>
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<td>Jim Jura</td>
<td>1994</td>
<td>Walt Yeager</td>
<td>2002</td>
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### RE TRUSTEES LIST

- Gerry Burrows
- David Christiano
- John Meyer
### CURRENT RSC REPS

- Shari Feist Albrecht
- Lamar Davis
- Kristie Fiegen
- Dennis Grennan
- Libby Jacobs
- Brian Kalk
- Patrick Lyons
- Dana Murphy
- Donna Nelson
- Stephen Stoll

### FORMER RSC REPS

- Denise Bode 2004
- Sandra Hochstetter Byrd 2004
- Jeff Cloud 2007
- Jeff Davis 2007
- Steve Gaw 2004
- Kevin Gunn 2011
- Collette Honorable 2008
- David King 2004
- Steve Lichter 2014
- Mike Moffett 2007
- Brian Moline 2004
- Donna Nelson 2011
- Julie Parsley 2004
- Olan Reeves 2011
- Michael Siedschlag 2009
- Barry Smitherman 2008
- Paul Suskie 2008
- Thomas Wright 2011
CURRENT SPP OFFICERS

Nick Brown, President and CEO
Carl Monroe, Executive Vice President and Chief Operating Officer
Paul Suskie, Executive Vice President of Regulatory Policy and General Counsel
Tom Dunn, Senior Vice President, Finance and Chief Financial Officer
Mike Ross, Senior Vice President, Government Affairs and Public Relations
Michael Desselle, Vice President, Chief Compliance and Administrative Officer
Lanny Nickell, Vice President, Engineering
Bruce Rew, Vice President, Operations
Malinda See, Vice President, Corporate Services
Barbara Sugg, Vice President, Information Technology and Chief Security Officer
The Power of Relationships