Helping our members work together to keep the lights on... today and in the future
SPP at a Glance

• Located in Little Rock

• Approximately 600 employees

• Primary jobs – electrical engineering, operations, settlements, and IT

• 24 x 7 operation

• Full redundancy and backup site
Regulatory Environment

- Incorporated in Arkansas as 501(c)(6) non-profit corporation

- FERC - Federal Energy Regulatory Commission
  - Regulated public utility
  - Regional Transmission Organization
  - Must comply with applicable FERC Orders and SPP’s approved transmission tariff

- NERC - North American Electric Reliability Corporation
  - Founding member
  - Regional Entity
  - Must comply with applicable NERC Reliability Standards
What is an RTO?

• Regional Transmission Organizations (RTOs) are independent, non-profit organizations that ensure transmission grid reliability, provide non-discriminatory access to the transmission system, and optimize supply and demand bids for wholesale electric power

• Minimum characteristics and functions of an RTO are specified in FERC’s Order 2000

• Participation by electric utilities in RTO encouraged by FERC but not mandated

• Services provided in accordance with a FERC approved transmission tariff

• Reliability functions performed in accordance with mandatory FERC approved reliability standards
Independent System Operator (ISO) / Regional Transmission Organization (RTO) Map
## SPP’s Membership Profile

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investor Owned Utilities</td>
<td>14</td>
</tr>
<tr>
<td>Cooperatives</td>
<td>13</td>
</tr>
<tr>
<td>Marketers</td>
<td>12</td>
</tr>
<tr>
<td>Municipals</td>
<td>11</td>
</tr>
<tr>
<td>Independent Power Producers/Wholesale Generation</td>
<td>11</td>
</tr>
<tr>
<td>Independent Transmission Companies</td>
<td>10</td>
</tr>
<tr>
<td>State Agencies</td>
<td>5</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>76</strong></td>
</tr>
</tbody>
</table>

As of April 11, 2014
SPP’s Current Operating Region

- 370,000 miles of service territory
- 627 generating plants
- 77,366 MW of generating capacity
- 46,136 MW of peak demand
- 4,103 substations
- 48,930 miles transmission:
  - 69 kV – 12,569 miles
  - 115 kV – 10,239 miles
  - 138 kV – 9,691 miles
  - 161 kV – 5,049 miles
  - 230 kV – 3,889 miles
  - 345 kV – 7,401 miles
  - 500 kV – 93 miles
2013 Energy Consumption and Capacity

Capacity

- Gas: 42.04%
- Coal: 34.08%
- Wind: 10.01%
- Hydro: 4.55%
- Dual Fuel: 4.06%
- Nuclear: 3.34%
- Fuel Oil: 1.83%
- Other: 0.08%

Consumption

- Coal: 61.2%
- Gas: 21.2%
- Wind: 10.8%
- Nuclear: 6.0%
- Hydro: 0.6%
- Diesel Fuel Oil (DFO): 0.3%

12% annual planning capacity requirement
Generating Resources in SPP
Generating Resources in Arkansas
Annual Average Wind Speed - 80 meters
Renewable Portfolio Standards

Source: FERC, May 3, 2011
SPP’s Future Expanded Operating Region

• Adding 3 new members in fall 2015: Western Area Power Administration, Basin Electric Cooperative, and Heartland Consumers Power District
• Adds approximately 5-6,000 MW of peak demand
• Adds about a 50% increase in SPP’s current hydro capacity
FUNCTIONS
SPP’s Services and Reliability Functions

- Congestion Management
- Energy & Ancillary Serv. Markets
- Market Monitoring
- Transmission Service
- Generation Interconnection
- Transmission Planning

- Reliability Coordinator
- Balancing Authority
- Interchange Coordinator
- Transmission Provider
- Transmission Planner
- Planning Coordinator

Today...

...Future

Pursuant to SPP’s Transmission Tariff
Pursuant to NERC Reliability Standards
<table>
<thead>
<tr>
<th>Role</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability Coordinator</td>
<td>Maintains the Real-time operating reliability of the Bulk Electric System within a Reliability Coordinator Area.</td>
</tr>
<tr>
<td>Balancing Authority</td>
<td>Integrates resource plans ahead of time, maintains generation-load-interchange balance within a Balancing Authority Area, and contributes to Interconnection frequency in real time.</td>
</tr>
<tr>
<td>Interchange Coordinator</td>
<td>Ensures communication of Arranged Interchange for reliability evaluation purposes and coordinates implementation of valid and balanced Confirmed Interchange between Balancing Authority Areas.</td>
</tr>
<tr>
<td>Transmission Provider</td>
<td>Administers the transmission tariff and provides transmission services to customers under applicable agreements.</td>
</tr>
<tr>
<td>Transmission Planner</td>
<td>Develops a long-term (generally one year and beyond) plan for the reliability of the interconnected bulk electric transmission systems within a Transmission Planner area.</td>
</tr>
<tr>
<td>Planning Coordinator</td>
<td>Coordinates, facilitates, integrates and evaluates (generally one year and beyond) transmission and resource plans within a Planning Coordinator area and coordinates those plans with adjoining Planning Coordinator areas.</td>
</tr>
</tbody>
</table>
Timing of Our RTO Functions
TRANSMISSION PLANNING: BASIC CONCEPTS
SPP’s Planning Role

- Perform near and long-term reliability assessments of the transmission system in accordance with NERC TPL Standards
- Develop annual transmission expansion plans in accordance with Attachment O of the SPP Tariff
- Recommend transmission expansion plans and projects to the Board for approval
- Direct construction of Board approved projects (Notification to Construct)
What role do state regulators play in SPP?

- Regional State Committee - Retail regulatory commissioners from:
  - Arkansas
  - Nebraska
  - Oklahoma
  - Kansas
  - New Mexico
  - Texas
  - Missouri

  *Louisiana maintains active observer status*

- Primary responsibility for:
  - Cost allocation for transmission upgrades
  - Approach for regional resource adequacy
  - Allocation of transmission rights in SPP’s markets
Projects Constructed 2005- May 2014
## Transmission Construction Statistics

<table>
<thead>
<tr>
<th>Voltage Class</th>
<th>Reliability</th>
<th>Other</th>
<th>Total</th>
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### Average Time to Complete Projects*

<table>
<thead>
<tr>
<th>Voltage Class</th>
<th>345 kV</th>
<th>100 - 300 kV</th>
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</thead>
<tbody>
<tr>
<td>SPP</td>
<td>3.6</td>
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<tr>
<td>Arkansas</td>
<td>3.7</td>
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</table>

### Longest Time to Complete Projects*

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<th>100 - 300 kV</th>
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<tr>
<td>Arkansas</td>
<td>6.2</td>
<td>4.8</td>
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</table>

*Time to complete is measured from time Notification to Construct is issued, i.e., after project has been approved by SPP Board and completion of competitive bidding process to determine project constructor. It typically takes about one year to perform a planning study and another year to perform competitive bidding process.
MARKET OPERATIONS: BASIC CONCEPTS
**Wholesale Energy Market:**

<table>
<thead>
<tr>
<th>Sellers/Producers</th>
<th>Buyers/Consumers</th>
<th>Locational Prices</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Utilities</td>
<td>• Utilities</td>
<td>• Driven by Supply and Demand at defined locations</td>
<td>• Energy</td>
</tr>
<tr>
<td>• Municipals</td>
<td>• Municipals</td>
<td></td>
<td>• Operating Reserves</td>
</tr>
<tr>
<td>• Independent Power Producers</td>
<td>• Load Serving Entities (LSEs)</td>
<td></td>
<td>• Congestion Rights</td>
</tr>
<tr>
<td>• Generators</td>
<td>• Power Marketers</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
How SPP’s Energy Market Works

• SPP receives operational pricing information from participating suppliers of energy

• SPP forecasts how much demand it will have in the upcoming dispatch intervals

• SPP determines how much energy it needs to meet the demand and dispatches the least cost supplies while respecting operating constraints

• Utilizes Security-Constrained Economic Dispatch algorithm

• SPP has the responsibility and ability to dispatch out of economic order for reliability reasons
What is congestion?

• Congestion or “bottlenecks” happen when you can’t get energy to customers along a certain path
  – Desired electricity flows exceed physical capability

• Congestion caused by:
  – Lack of transmission, often due to load growth
  – Line and generator maintenance outages
  – Unplanned outages such as storms or trees on lines
  – Too much generation pushed to grid in a particular location
  – Preferred energy source located far from customers

• Results in inability to use least-cost electricity to meet demand
Congestion prevents access to lower-cost generation