Fresh beginnings, same WAPA

Mid-West Electric Consumers Association Board meeting
March 23, 2021 | Virtual meeting

Tracey LeBeau
Interim Administrator and CEO
About me

• Born in South Dakota
• Private sector thru 2011
• Appointee - Obama Administration at Department of Energy HQ
• Joined WAPA in 2014 - TIP manager
• WAPA’s CAO
• Senior VP & DSW Regional Manager
Changes from D.C.

• Active discussions during Biden transition and continuing with new DOE, DOI Leadership
• Congressional oversight and appropriations leadership: introductory briefings w/ members and staff underway
• All GOV focus on infrastructure: in development
• Keystone XL permit rescinded
• Pause on Bulk Power System Executive order
• Wildfire Resilient Power Grid Act of 2020
New DOE Secretary

Jennifer M. Granholm
Markets update

- WEIS transition completed Feb. 1
- DSW study results expected this spring.
- SN EIM go-live accelerated to March 25.
- Reviewed 2nd version of CAISO EIM governance.
- Evaluating SPP RTO expansion into the West.
Other priorities

- Resilience
- Workload Management
- Responsible Workplace Re-entry
- Data as a Strategy
- Standardized Budgeting and Reporting Initiative
- Hydropower MOU

2018 Carr Fire “firenado” damage

2020 permanent structure install at Carr Fire site
Winter Storm Uri

- SPP directed load shedding Feb. 16
- Rolling outages for 21 customers, lasting average of 55 minutes & as long as 2 hours
- Corps & WAPA delivered extra 27,150 MWh of hydropower to SPP Feb. 15-18.

Source: NOAA, Feb. 17
In Texas

• Generation went offline due to cold because not winterized – wind last to fail
• ERCOT prevented catastrophic cascading outages
• Deregulated, independent market didn’t possess adequate contingency plans for energy emergencies
Coronavirus response

- Stabilizing conditions, but not out of woods yet
- New variants
- Mask mandate on federal property
- Vaccine discussions
Personnel updates

• Posted vacancies for UGP and RM Regional Managers
  – Acting Senior VP and UGP Regional Manager Dave Neumayer
  – Acting Senior VP and RM Regional Manager Tim Vigil

• Acting Senior VP and DSW Regional Manager Jack Murray

• Acting Senior VP and CRSP Manager Rodney Bailey
Contact/follow me

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Ft Peck, COE
Upper Great Plains Regional Update

Dave Neumayer
Acting Senior VP and UGP Regional Manager
Operations Summary of Polar Vortex

Lloyd Linke
VP of Operations for UGP
Why do we shed load?

• Avoid Cascading Outages
  – A sequence of events in which an initial disturbance – or set of disturbances – subsequently triggers one or more dependent component outages

• Avoid Equipment Damage
  – Damaged power system equipment can cost millions and take months to even years to replace, and cause loss of reliability and or service until replacement

• Recover Reserves
• Avoid Under Frequency issues
• Avoid Under Voltage issues
What situations can lead to load shedding?

Four typical situations that can lead to load shedding

Capacity Emergency/Loss of Contingency Reserves
  – February Issue

• Low Voltage
• Overload of Flowgate/Equipment/Load Pocket
• Low Frequency
FERC AND NERC JURISDICTIONAL

- SPP and utilities must comply with mandatory, enforceable NERC standards
- Government enacted reliability standards after 2003 blackout
- NERC regularly audits SPP
- NERC directs how much energy SPP must keep for emergencies
- FERC approves NERC standards
- SPP must comply with FERC directives
Alerts

Severe Weather Alerts
• Hazardous Weather Outlook
• Severe Thunderstorm Watch – possible
• Severe Thunderstorm Warning – Occurring or Imminent
• Tornado Watch – thunderstorms with tornados possible
• Tornado warning – Tornado imminent

SPP Energy Alerts
• Weather Alert
• Resource Alert
• Conservative Operations
• Maximum Emergency Generation Notification
• Energy Emergency Level 1
  – All available Generation resources in use
• Energy Emergency Level 2
  – Load Management procedures in effect
• Energy Emergency Level 3
  – Firm load interruption is imminent or in progress
Weather and resource alert

• Weather Alert
  – Extreme weather is expected in the SPP Balancing Authority

• Resource Alert
  – The following conditions in SPP Balancing Authority
    • Severe Weather
    • Significant outages
    • Wind forecast uncertainty
    • Load-forecast uncertainty

• Similar to Hazardous Weather Outlook
Conservative Operations

• Need to operate the system in a conservative manner due to:
  – Weather
  – Environmental
  – Operational
  – Terrorist
  – Cyber
  – Other events

• Severe Thunderstorm Watch
  – Severe Thunderstorms possible
Maximum emergency generation

- SPP Foresees the need to use emergency ranges of generation
- Severe Thunderstorm Warning
  - Thunderstorms are occurring to imminent
Energy Emergency Level 1 and 2

- **EEA 1** – All available generation in use
  - All available resources have been committed to meet obligations
  - At risk of not meeting required operating reserves
  - NERC EOP-011
- **EEA2** – Load management procedure in effect
  - Can no longer provide expected energy requirements
  - Is an Energy Deficient Entity
  - Or foresees or implemented procedures up to, but excluding interruption of firm load commitments
  - NERC EOP-011
- **Similar to Tornado Watch**
  - Difference severe thunderstorms are occurring
  - Tornados highly possible
Energy Emergency Level 3

- EEA 3 - Firm load interruption is imminent or in progress
  - Reserves below required minimum
  - Initiated reserve sharing
  - Foresees or has implemented firm load curtailments
  - NERC EOP-011
    - If instruction to curtail load is received, it is required to take place
      - NERC IRO-001
      - Not optional

- Similar to Tornado Warning
  - A tornado is actually occurring but may or may not be on the ground
HISTORIC WEATHER EVENT

- 73% of mainland U.S. covered in snow ¹
- 3,000 daily and 79 all-time local low temperature records broken ²
- “Comparable to the historical cold snaps of Feb. 1899 & 1905.” ³

¹ – National Oceanic and Atmospheric Administration
² – National Weather Service Weather Prediction Center
³ – National Weather Service Weather Prediction Center
SPP REGION IN COLDEST PART OF U.S.

Lowest temperatures forecast for Feb. 14-16, 2021

Source: National Weather Service, Global Forecast System

- SPP service territory/balancing authority
- Temperatures below 0°F
- Between 0° and 32°F
- Above 32°F

* Locations of ISOs/RTOs are approximate
**SPP BALANCING AUTHORITY OPERATIONS:** FEB. 4-20, 2021

**Thurs. 2/4 to Mon. 2/8**
Normal operations in effect

**Thurs. 2/4:** Issued cold weather alert to grid operators

**Thurs. 2/11:** Committed longer-lead time generating resources for Sat. 2/13 to Tues. 2/16

**Mon. 2/8:** Issued resource alert to grid operators: “Implement resource preparations... ensure resource commitment start-up and run times... report fuel shortages & transmission outages...”

**Tues. 2/9:** Declared conservative operations until further notice

**Sun. 2/14**
Requested member companies issue public appeals for conservation

**Mon. 2/15**
Declared EEA1 to be effective 2/15 at 0500

**Conservative operations in effect**

**Tues. 2/16**

- 05:00
  - Declared EEA1
- 06:15
  - Declared EEA3
- 07:22
  - Declared EEA2
- 06:44
  - Demand interruption
- 10:08
  - Declared EEA3
  - New record peak
- 12:04
  - Demand interruption
- 13:01
  - EEA3
- 12:31
  - Declared EEA1
- 14:00
  - Declared EEA2
- 18:28
  - Declared EEA2
- 18:20
  - Declared EEA2
- 22:59
  - Declared EEA1

**Wed. 2/17**

- EEA2 in effect
- 10:07 - EEA3
- 11:30
  - Declared EEA2

**Thurs. 2/18**

- EEA2 in effect
- 09:30
  - Ended EEA and remained in conservative operations through 22:00 Sat. 2/20, with appeal for public conservation

**Fri. 2/19**

- EEA1 in effect
- 09:20
  - Ended EEA and remained in conservative operations through 22:00 Sat. 2/20, with appeal for public conservation

**Sat. 2/20**
Conservative operations in effect

**22:00**
Declared normal operations
AVAILABLE GENERATION IN SPP MARKET

Extreme weather reduced available generation by ~20 GW below historical Feb. average
2/15 LOAD & ONLINE GENERATION WITH NET ENERGY IMPORTS

- BA Load
- Online Generation & Scheduled Interchange
- ACE Interchange

Morning outage & fail-to-start total 3,790 MW

10:08 EEA3

12:04 SPP directed 610 MW of firm load shed

Upcoming hour schedule curtailments begin (2,500 MW imports)

13:01 SPP instructed firm load restoration

*ACE – Area Control Error is the instantaneous difference between a Balancing Authority’s net actual and scheduled interchange, taking into account the effects of frequency bias & correction for meter error.
NET ENERGY IMPORTS

At times, SPP was importing significant amounts of energy.
**2/16 LOAD & ONLINE GENERATION WITH NET ENERGY IMPORTS AND ACE**

*ACE – Area Control Error is the instantaneous difference between a Balancing Authority’s net actual and scheduled interchange, taking into account the effects of Frequency Bias & correction for meter error*
At times, SPP was importing significant amounts of energy, although less than what had been available day prior.
## INTERRUPTIONS BY ENTITY

<table>
<thead>
<tr>
<th>Participating Entity</th>
<th>% of MW</th>
</tr>
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<tbody>
<tr>
<td>CSWS</td>
<td>16.8</td>
</tr>
<tr>
<td>WAPA</td>
<td>13.5</td>
</tr>
<tr>
<td>SPS</td>
<td>12.4</td>
</tr>
<tr>
<td>OKGE</td>
<td>12.4</td>
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<tr>
<td>KCPL</td>
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<td>WR</td>
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<td>NPPD</td>
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<td>OPPD</td>
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<td>WFEC</td>
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<td>SPRM</td>
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<tr>
<td>SPA</td>
<td>0.28</td>
</tr>
<tr>
<td>TSGLT</td>
<td>0.13</td>
</tr>
</tbody>
</table>

**SPP Total** 100%

Winter percentages effective 12/1 through 2/28

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Directed interruptions allocated to transmission operators on pro-rata basis
Lessons learned

• Communicate the state of the grid
• Communicate and discuss load shedding process with each entity
• Training on the various grid levels
• Periodic drill
  – Initial drill this year
Broadcast the state of the grid

- Decide which SPP alerts to broadcast
  - May not be the same for all entities
- Who should receive the broadcast
- Email exploder
- Potentially looking for a system that would be able to send text messages or phone notifications
- Telephone number to call that doesn’t take time away from the System Operator
Communicate and discuss load curtailment process with each entity

- Discuss with entity on how load curtailment would take place
  - Can we let the entity know their share and they take care of curtailment
    - How much of an advance notice needed
      - If too long we may need to look at other means
    - Do we do it via facilities within WAPA control
      - If so which facilities
Training on Alert Levels and drill

• Alert Levels
  – Short training similar to previous discussion
  – Annually?
  – Held just before drill?

• Conduct periodic drill
  – Exercise to make sure everyone is ready and knows what to expect
  – Initial drill this year
  – How often to have the drill?
Power Marketing Update and Power Vortex Financial Impact

Lori Frisk
VP of Power Marketing for UGP
Customer contracts update

• 2021 Power Marketing Initiative
  – 30-year Firm Electric Service Contracts through 2050
    • 1/1/2021 removal of up to 7% losses and/or a 1 mill discount
  – 30-year Native American Tribe Bill Crediting Contracts with 22 of 25 tribes
    • Continue to work with Flandreau, Ponca and Omaha
    • PMI Tribal Contract update – Contact Darla at (406) 255-2938

• 2021 Other Contracts
  – FES Exhibits B & C Project to start this summer, approx. 600
  – Other Contracts, Construction, Maintenance, Interconnection, Environment, Communications, Generation, Transmission, etc.
Extreme weather event Feb 2021
COE generation: Scheduled and actual

[Bar chart showing COE generation from 14-Feb to 20-Feb with initial COE target and additional reliability energy]
Extreme weather event
Total daily generation and load
Extreme weather event
Average day-ahead generation LMPs

![Graph showing LMPs over time with notable events HE9 at $2118.63 and HE19 at $1879.17]
Extreme weather event
Average real-time generation LMPs
Extreme weather event
Average day-ahead load LMPs

Day Ahead 2/7-2/13
Day Ahead 2/14-2/20
Day Ahead 2/21-2/27
Extreme weather event
Average real-time load LMPs

$2,500
$2,250
$2,000
$1,750
$1,500
$1,250
$1,000
$750
$500
$250
$(250)

HE8, $914.51
HE19, $1266.78

Real Time 2/7-2/13
Real Time 2/14-2/20
Real Time 2/21-2/27
Extreme weather event
Average day-ahead generation LMPs
Extreme weather event
Average real-time generation LMPs
Extreme weather event
Generation shortage (includes reliability energy for Feb. 15-18)
SPP Integrated Marketplace (East)
Total market charges by week
UGP marketing – energy only

*Purchase and sales as of 3/11/2020*
CY 2020 Missouri River runoff above Sioux City, Iowa

Million Acre-Feet

Mar 1, 2020 Forecast – 21.7 MAF – 84%
Average: 25.8 MAF
Gavins Point annual release

Million Acre-Feet

Mar 1, 2021 Forecast
Upper Basic: 24.3 MAF
Lower Basic: 19.1 MAF
Missouri River mainstem system forecasted energy generation

- Upper Basic: 11,800 GWh
- Basic: 9,600,400 GWh
- Lower Basic: 9,400 GWh
Mainstem system generation

Millions of megawatt-hours

Mar 1, 2021 Forecast

Upper Basic: 11.8

Lower Basic: 9.4
Polar Vortex Rate Impact

Dave Neumayer
Acting Senior VP and UGP Regional Manager
P-SMBP composite rate projection is holding

Assumptions:
- Median water
- O&M inflated 3% per year on Work Plan data
- Investments average $90M per year
- No adjustment to rate until drought paid off
- Ft. Randall add $55 M every other year starting in 2024 plus $1M added revenue each year
P-SMBP rate update

- Study set at 24.29 mills/kWh for Pick Sloan Composite rate
- *Polar Vortex Impact*
  - Pick Sloan FY21 PPW projection of $46M, two weeks of SPP billing totaled $138M
  - Deficit very likely this Fall
    - Too early to predict amount
    - Deficits have 10-year balloon payment
    - With average water, could potentially pay off deficit in 2 years
- Pinch Point in 2045 – $231M Aid to Irrigation
- Drought Adder customer notification
  - Preliminary Notice in June
  - Final Notice in October
P-SMBP 2020 PRS required payments

Millions

Deficit  Inv/Add  Repl  Aid

- $231M
- $133M
- $45M
- $58M
- $54M
Questions?
Rocky Mountain Regional Update

Tim Vigil
Acting Senior VP and RM Regional Manager
Personnel updates in RM

On April 1:

• John Aust will detail as VP of Transmission System Assets for RM (expect to fill position permanently ASAP)

• Pete Heiman will detail as VP of Operations for CRSP, DSW, and RM
Market Update

• **SPP WEIS**
  - Implemented on February 1
  - Fine tuning and tweaks

• **SPP RTO West Expansion**
  - WEIS members
  - CRSP participation
Polar Vortex Pricing Impacts to LAP

Prices spiked from 2/15 to 2/20 in bilateral market.
- Spiked 2/15 to 2/18 in SPP WEIS

**Bilateral**
Total purchases for 5 days- 8,514 MWh
Average price - $277.76/MWh

**SPP WEIS- LAP LMP**
Average price (5 days)- $192.60/MWh
Average price (2/15 to 2/18)- $271.81/MWh
RM Rate Updates

Sheila Cook
Acting VP of Power Marketing
LAP FES rate update

• LAP Firm Electric Service Rate Schedule L-F11 became effective January 1, 2018
  • Effective through December 31, 2022
  • Drought Adder reduced to zero
  • By 2019, LAP Composite Rate reduced by 14% to 31.44 mills/kWh

• 2022 Rates
  • No rate adjustment for LAP Base Rate
  • Monitoring Drought Adder
    • Preliminary notification letters sent ~June
    • Final notification letters sent in the fall ~ Oct
LAP FES rate update

• **Fry-Ark**
  - Has been experiencing rate pressures related to the on-going rehabilitation efforts at Mt. Elbert Powerplant
    - BOR’s FY22 work plan had $19.4M of rehab investment to be booked by FY22.
  - O&M costs have increased for both BOR and WAPA
  - Est $3.1M+ increase to revenue requirement in FY23
    - Upward pressure of ~1.5mills/kWh (5%) to LAP rate

• **Pick-Sloan-WD**
  - Will experience some rate pressures due to the revamped 10-year plan reflected in the FY 2023 work plans.
LAP FES rate update

• FY 21 PRSs
  – April 2021 updated to include the FY23 workplans
  – Updated to include the latest generation projections, which will be used to determine purchase power and sales estimates
  – Estimates for the WEIS Market activities (PP, sales, EI)

• Anticipate initiating rate adjustment process in January 2022 to have new 5-year rates in place for January 2023.
Transmission, Ancillary Services and Losses Formula Rates

- RM’s rates for transmission, ancillary services, and losses were approved for the period of October 1, 2016 - September 30, 2021
  - Transmission and Unreserved Use
  - Scheduling, System Control, and Dispatch
  - Reactive Supply and Voltage Control
  - Regulation and Frequency Response
  - Spinning and Supplemental Reserves
  - Energy and Generator Imbalance
  - Transmission Losses

- For the WEIS Market, RM implemented revised/new rates under the Administrator’s short-term rate authority – for the period of February 1, 2021 - September 30, 2021
  - Energy and Generator Imbalance (Superseded existing schedule)
  - BA Real Power Losses (Superseded existing schedule)
  - Joint Dispatch Transmission (New schedule)
Transmission, Ancillary Services and Losses Formula Rates

- RM is preparing rate adjustment documents
  - minor rate adjustment to put long-term rates for RM to use under the WEIS Market (JDTS, EI/GI, Losses) in place for a 3-year period effective October 1, 2021
  - 3-year rate extension for the remaining 5-year transmission and ancillary services rates effective October 1, 2021

- Anticipate publishing Rate Proposals in the Federal Register at end of April 2021
  - 30-day Comment Periods begin on date of publication.
Questions?