Welcome to the CRSP Annual Customer Meeting
June 20, 2019
11:00 am – 3:00 pm

The meeting will begin at 11:00 am MDT
Please stand-by until the meeting begins.
Please remember to place your phone on mute.

Presentation -
Within the SOURCE: https://www.wapa.gov/About/the-source/Pages/Presentations-Speeches.aspx
CRSP-MC Site: https://www.wapa.gov/regions/CRSP/Pages/crsp.aspx

Full Binder Handout - https://www.wapa.gov/regions/CRSP/rates/Pages/rates.aspx
Welcome and Introductions
## Agenda

**CRSP-MC Annual Customer Meeting**  
**June 20, 2019**  
**11:00 am – 3:00 pm**

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00, 5 min</td>
<td>Welcome and Introductions</td>
<td>Steve Johnson, Senior VP and CRSP Manager</td>
</tr>
<tr>
<td>11:05, 30 min</td>
<td>Investing in a connected future, Fiber Update</td>
<td>Mark Gabriel, Administrator and Chief Executive Officer</td>
</tr>
<tr>
<td>11:35, 25 min</td>
<td>WAPA Information Technology Update</td>
<td>Mike Montoya, Acting Senior VP and Chief Information Officer</td>
</tr>
<tr>
<td>12:00, 20 min</td>
<td>Environmental Update (Bug Flows, ESA Activities)</td>
<td>Craig Ellsworth, CRSP Biologist</td>
</tr>
<tr>
<td>12:20, 25 min</td>
<td>Chief Financial Officer Update</td>
<td>Dennis Sullivan, Senior VP and Chief Financial Officer</td>
</tr>
<tr>
<td>12:45</td>
<td>Break - 15 minutes</td>
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<tr>
<td>1:00, 45 min</td>
<td>Rate Update</td>
<td>Thomas Hackett / Tony Henriquez - CRSP Rates</td>
</tr>
<tr>
<td>1:45, 30 min</td>
<td>WEIS/Markets update</td>
<td>Tim Vigil, CRSP MC VP of Power Marketing</td>
</tr>
<tr>
<td>2:15, 20 min</td>
<td>Regional Manager Updates</td>
<td>Steve Johnson, Senior VP and CRSP Manager</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ron Moulton, Senior VP and DSW Regional Manager</td>
</tr>
<tr>
<td>2:35, 25 min</td>
<td>Questions and Closing</td>
<td>Tim Vigil, CRSP MC VP of Power Marketing</td>
</tr>
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</table>
A connected WAPA
Shared Integrated Grid
Preparing for the future
Connected world
Tactical Action Plan

MISSION CRITICAL CUSTOMER SERVICES IN AN EVOLVING INDUSTRY
- Preparing for Markets
- Organizational Approach to Markets

GRID RESILIENCE
- Physical Security
- Cybersecurity
- Emergency Management
- Strategic Transformer Management
- Fiber Partnerships

ASSET MANAGEMENT 2.0
- Life Cycle Management of Major Assets
- Life Cycle Management of Additional Assets
- Data as a Strategic Asset

PEOPLE AND ORGANIZATION
- Human Performance and Just Culture
- Leadership Development
- Program and Budget Integration
- Acquisition Management
Mission-critical services

• Exploring energy imbalance options
• Organizational Approach to Markets
• Reliability coordinator transition

Image credit: Adapted from NERC and WECC graphics
Evolving with industry, customers

• Energy Imbalance Markets
  • Ensure reliable delivery of our hydropower while adjusting to a changing energy mix
• Integrated Resource Plans
• RC transition
• Vegetation management
• Northwest Power Pool
Grid resilience

• Increasing regulations
• Internet of Things
• OT/IT convergence
• Asset management nexus
• “Smart” technology
• Continuing communications
Grid resilience
Physical Security update

• Implemented tiered security protection levels to focus resources on more critical sites
  • 1,000+ tasks reduced to ~450
• Expect 94 site assessments to be complete by year’s end
• 72% of planned security tasks to be complete for FY 2019
• FY 2020 tasks: 103
• FY 2021 tasks: 72
Fiber update

• To date
  • Established Fiber Optic Partnerships feasibility assessment team
  • Submitted plan for Feasibility Assessment to DOE
  • Held initial meeting with work group

• June-September: Regional outreach

• December: Submit feasibility assessment

• Report progress quarterly using performance metrics
Asset Management 2.0

- Published 2019 almanac in May
- Data-driven insight supports decision making
- Next asset classes
  - station batteries
  - current transformers
  - capacitive voltage transformers
  - IT network equipment
People and Organization

- Human Performance and Just Culture
- Leadership development
- Program and budget integration
- Acquisition management
CRSP MC accomplishments

• Paid-off Dolores’ original investment in FY 2018
  • Final repayment of original investments in SLIP

• Expecting rate decrease next year after decade of stable rates
Key takeaways

Preparing for a connected energy future. Stay flexible to meet industry changes. Preserve and strengthen ability to complete mission.
Contact/follow me

Mark A. Gabriel
720.962.7705
gabriel@wapa.gov

wapa.gov
@westernareapowr
Mark Gabriel
WesternAreaPower1
westernareapower
wapa.gov
Information Technology overview and update
Mike Montoya, Acting SVP and CIO

June 20, 2019
CRSP Annual Customer Meeting
Salt Lake City, Utah
Mission

Enable WAPA’s mission by working in partnership with employees, customers and stakeholders to deliver technology services that are:

- Cost effective
- High quality
- Accessible
- Innovative
- Reliable
- Secure
Operating principles

**Innovation**
We model an innovative spirit and leverage technology that enables mission delivery amid a changing industry.

*Keeps WAPA relevant, resilient, agile*

**Partnership**
We partner with stakeholders to provide strategic and technology solutions that create business value across the organization.

*Keeps WAPA connected, engaged, responsive*

**Stewardship**
We value operational excellence and cost management in all we do, as we provide secure and reliable services.

*Keeps WAPA efficient, focused, responsible*

**Transparency**
We operate transparently and make information available to promote trust and maintain integrity with all stakeholders.

*Keeps WAPA accessible, open, trustworthy*
Delivering strategic business value

- Solve business problems
- Help identify efficiencies
- Align with 12/14 TAP initiatives
IT Evolution

Why

- Prior structure was 20yrs old
- Changing industry and IT landscape
- Increased complexity of operations

Outcomes

- Reduced risk
- Increased control of spending
- Apply WAPA-wide focus
- Increased efficiency (solve problems once, not five times)
- Experts across organization
- Increased agility
How we are organized

SVP and CIO

- Management and Program Analyst
- Executive Assistant
- Enterprise Architect

- O&M Technology
- Cyber Security
- Network
- Infrastructure
- SCADA
- Enterprise Applications
- Power Management and Marketing
Accomplishments

- Lifecycle management strategy
- Software inventory
- 10-year capital planning
- Focus on transparency / IT spend
- Budget process improvements
Primary IT cost drivers

- **Strategic initiatives**
- **Lifecycle management**
- **Regulatory obligations**
IT priority projects

- Common SCADA vendor
- Network enhancements
- Records Management
- Reliability Coordinator services
Looking ahead: Megatrends

• Cloud computing
• AI and machine learning
• Cybersecurity
Bugflow Experiment at Glen Canyon Dam
Hypothesis

- Daily fluctuations were drying out eggs laid by these aquatic insects
Bugflow Experiment at Glen Canyon Dam

• **Test:**
  Two days of low, steady flows per week

• **Objective:**
  Increase production and diversity of aquatic bugs

• **Why:**
  More food for the Lees Ferry rainbow trout fishery and native fish downstream like endangered humpback chub
Coordination with GCMRC scientists in experimental design

- Scientists had a working hypothesis
- How to test?
- Coordinated with WAPA on a hydrograph that met study needs while reducing impacts to hydropower
  - Two days = weekend
  - Move weekend water to on-peak on weekdays
  - Increased capacity
  - Financial benefit/costs depends on difference between on-peak and off-peak prices
Additional monitoring done at WAPA’s request

- Flaming Gorge and double peak
  - Studies showed that double peak was not adversely affecting the fishery
  - Drift (food) is linked to flow fluctuations

- Would two days of low, steady flows at Glen Canyon adversely affect the rainbow trout fishery (and possibly humpback chub)?
Weekday/weekend drift monitoring

• Bug production, food availability, and fish
  • Bugflows are expected to increase production and diversity
  • Low, steady flows may decrease drift
  • Lower flows clarify the water and may concentrate food
  • How will the fish respond?

• Catchability
  • Fluctuating flows stir up food and increase feeding (on the ascending limb)
  • Lower flows make access to good fishing spots easier
Weekday/weekend drift monitoring

• Insect monitoring
  • Drift
  • Light traps
  • Sticky traps

• Fish diet
  • Fullness
  • Contents
  • Quality

• Angler success
  • Guides
  • Stakeholders
  • Scientists
Weekday/weekend drift monitoring

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  - Guides
  - Stakeholders
  - Scientists
Preliminary Results

- Increased midge emergence on weekends
- Higher catch rates of trout on weekends
- Shift in midge abundance in Grand Canyon
- Increase in caddisflies in lower Grand Canyon
- Follow along with the GCDAMP wiki site:
  - The Bugflow Experiment page

FY19 WAPA-wide Financial Execution

- **Purchase Power & Wheeling**: Forecasting +$39M reserves
- **Annual O&M**: Forecasting $1.4M over work plan
- **Appropriations**: Forecasting $1.6M under work plan
- **Total Capital**: Forecasting $27.9M under work plan
- **Return to Treasury**: Forecasting $226M
FY 2019 CRSP Basin Fund: Forecast of Cash Reserve and FYE Return to Treasury

Data as of April 30, 2019

Current Year Projection

Sept 2019 Projected Return to Treasury (including constructive returns): $23 million

Forecast Variance: (1) Original Forecast did not have a cash return to treasury of $21M; (2) PPW costs are higher than originally forecasted; and (3) September includes a projected $28M transfer from Reclamation for prior year Municipal & Industrial (M&I) surplus revenues.

Cost Recovery Charge (CRC) Threshold

Table Summary ($ in millions)

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<td>Current Forecast</td>
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<td>Variance ($)</td>
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<td>(11.1)</td>
<td>(14.2)</td>
<td>(20.8)</td>
<td>(22.4)</td>
<td>(21.9)</td>
<td>(16.9)</td>
<td>(13.8)</td>
<td>(16.2)</td>
<td>(14.3)</td>
<td>(11.0)</td>
<td>8.9</td>
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<td>Variance (%)</td>
<td>3.0%</td>
<td>-7.5%</td>
<td>-9.2%</td>
<td>-13.7%</td>
<td>-15.3%</td>
<td>-15.2%</td>
<td>-11.9%</td>
<td>-9.9%</td>
<td>-11.4%</td>
<td>-10.3%</td>
<td>-8.0%</td>
<td>6.5%</td>
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</table>

Source: CRSP Regional Office
Basin Fund – Environmental Programs Funds Transfer

• Fiscal Year 2019
  • OMB administrative direction to return $23M to Treasury
  • USBR secured appropriations

• Fiscal Year 2020
  • DRAFT House EWD bill
  • $21.4M shall be transferred to USBR

• Sustainable solution?
Purchase Power & Wheeling

- FY18 Congressional report status
- The greater of:
  - Actual PPW obligations in current year, or …
  - PPW estimate in PRS
- Reserve strategy progress
  - FY18 reserve: $291m
  - FY19 projection: +$39M
  - FY20 budget markup: -$90M
- FY20 Congressional report request
  - Options for new PPW account structure
Capital Appropriations Status

Capital Appropriations
FY 2010 - FY 2021

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<td>-2% Inflation</td>
<td>109</td>
<td>111</td>
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<td>121</td>
<td>123</td>
<td>125</td>
<td>128</td>
<td>130</td>
<td>133</td>
<td>136</td>
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</table>
Symptoms of a broader problem

- “Cobbled together” legislative authorities
  - Not well understood
  - Reinterpretation risk
- 100% reliant on cash
  - All receipts not discretionary
  - Alternative financing approach
- No borrowing mechanism
- Sub-optimal decisions
- Complexity implications
Financial Transparency / Program Collaboration

• Enhanced financial reviews
  • Work plans
  • Execution reviews
  • HQ 10YP
  • WAPA program leaders

• Expanded “The Source”
  • Access to historical data

• Technology & Security Symposium

• Financial transparency vs. Programmatic insight?
Contact/follow me

**Dennis Sullivan**
720.962.7500
dsullivan@wapa.gov

- [wapa.gov](http://wapa.gov)
- [@westernareapowr](https://twitter.com/westernareapowr)
- [@D_Sullivan03](https://twitter.com/D_Sullivan03)
- [Dennis Sullivan](https://www.linkedin.com/in/dennis-sullivan-a3548680/)
- [WesternAreaPower1](https://www.youtube.com/user/WesternAreaPower1)
Rates Update

Thomas Hackett and Tony Henriquez
CRSP-MC Rates

June 20, 2019
CRSP Annual Customer Meeting
Salt Lake City, UT
1. Transmission Rate
2. Status of Repayment
3. Current SLCA/IP Firm Power Rate (SLIP-F10)
4. SLCA/IP Annual Revenue Requirement & Firm Power Rates Comparison
5. Rate Action
Transmission Rate
5 Year Historical

<table>
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<tr>
<th>Fiscal Year</th>
<th>kW-month</th>
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<tbody>
<tr>
<td>2015</td>
<td>$1.11</td>
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<tr>
<td>2016</td>
<td>$1.28</td>
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<td>2017</td>
<td>$1.48</td>
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<tr>
<td>2018</td>
<td>$1.45</td>
</tr>
<tr>
<td>2019</td>
<td>$1.63</td>
</tr>
<tr>
<td>2020</td>
<td>$1.58</td>
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</table>

Projected, pending final
### Calculate True-Up
### FY2019 Transmission Rate

<table>
<thead>
<tr>
<th></th>
<th>Projected (FY18)</th>
<th>Actual (FY18)</th>
<th>Difference</th>
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</thead>
<tbody>
<tr>
<td>Plant</td>
<td>$702,352,887</td>
<td>$676,031,999</td>
<td>($26,320,888)</td>
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</table>

% of Plant to Transmission  
(0.17%)

After Calculations: True-Up to ATRR for FY20  
= ($108,578)
## Pending FY2020 Transmission Rate

### Pending For FY 2020

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
<th>kW-Month</th>
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<tbody>
<tr>
<td>Annual Transmission Revenue Requirement (ATRR)</td>
<td>$87,754,860</td>
<td>$1.581</td>
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<tr>
<td>True-Up</td>
<td>$(108,578)</td>
<td>$0.002</td>
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<tr>
<td>Updated Atrr</td>
<td>$87,646,282</td>
<td>$1.579</td>
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### Rate Change 2020-2019:

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<th>FY2020</th>
<th>FY2019</th>
<th>Change (kW-Month)</th>
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<td></td>
<td>$</td>
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<td>FY2020</td>
<td>$1.579</td>
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<td>- FY2019</td>
<td>$1.629</td>
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<td>$(0.050)</td>
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SLCA/IP Rate
## SLCA/IP Rate

### SLCA/IP Status of Repayment *(tab 2)*

**As of September 30, 2018**

<table>
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<tr>
<th>Project</th>
<th>Investment ($million)</th>
<th>Amount ($million)</th>
<th>FY2018 Percent</th>
<th>FY2017 Percent</th>
<th>Variance</th>
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<tr>
<td>CRSP (Power Only)</td>
<td>1,374.515</td>
<td>1,205.178</td>
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<td>87.98%</td>
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<td>CRSP Irrigation/Aid</td>
<td>1,174.515</td>
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<td>17.20%</td>
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<td>Collbran</td>
<td>27.023</td>
<td>23.191</td>
<td>85.82%</td>
<td>85.62%</td>
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<td>Dolores</td>
<td>38.986</td>
<td>38.167</td>
<td>97.90%</td>
<td>34.43%</td>
<td>63.47%</td>
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<td>Rio Grande</td>
<td>29.651</td>
<td>24.758</td>
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<td>97.07%</td>
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<td>Seedskadee</td>
<td>12.527</td>
<td>9.699</td>
<td>77.42%</td>
<td>93.00%</td>
<td>-15.58%</td>
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</table>
# Aid to Participating Projects

## May 2019 Update

Values in 1,000’s

## FY 2018 PRS

<table>
<thead>
<tr>
<th>Year</th>
<th>Colorado 46% Incremental Available</th>
<th>New Mexico 17% Incremental Available</th>
<th>Utah 21.5% Incremental Available</th>
<th>Wyoming 15.5% Incremental Available</th>
<th>Total Incremental Available</th>
<th>Cumulative Available</th>
<th>Paments to date</th>
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<tbody>
<tr>
<td>2015</td>
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<td>9,543</td>
<td>12,069</td>
<td>34,772</td>
<td>774,031</td>
<td>774,031</td>
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</tbody>
</table>

Total: 387,780  502,086  29,427  185,820  319,389  235,007  37,435  169,424  774,031  1,093,056

Note: Boxed yellow amounts trigger apportionment. Boxed green amounts indicate total available with apportion.
SLCA/IP Firm Power Rate

- Current Firm Power Rate (SLIP-F10, Tab 3)
  - Effective Oct. 1, 2015
  - Energy: 12.19 mills/kWh
  - Capacity: $5.18 kW/month
  - Composite Rate: 29.42 mills/kWh
- Expires September 30, 2020
- Cost Recovery Charge (Tab 17)
  - 0.00 mills/kWh
## History of SLIP Rates

<table>
<thead>
<tr>
<th>Date (CY)</th>
<th>Capacity $/kW</th>
<th>Energy mills/kWh</th>
<th>Composite mills/kWh</th>
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<tbody>
<tr>
<td>1993</td>
<td>3.54</td>
<td>8.40</td>
<td>18.70</td>
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<tr>
<td>1995</td>
<td>3.83</td>
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<td>20.17</td>
</tr>
<tr>
<td>1998</td>
<td>3.44</td>
<td>8.10</td>
<td>17.57</td>
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<tr>
<td>2002</td>
<td>4.04</td>
<td>9.50</td>
<td>20.72</td>
</tr>
<tr>
<td>2005</td>
<td>4.43</td>
<td>10.43</td>
<td>25.28</td>
</tr>
<tr>
<td>2008</td>
<td>4.70</td>
<td>11.06</td>
<td>26.80</td>
</tr>
<tr>
<td>2009 (FY10)</td>
<td>5.18</td>
<td>12.19</td>
<td>29.62</td>
</tr>
<tr>
<td>2015</td>
<td>5.18</td>
<td>12.19</td>
<td>29.42</td>
</tr>
</tbody>
</table>

**Step 1**

- 2008: 4.70 $/kW, 11.06 mills/kWh, 26.80 mills/kWh

**Step 2**

- 2009 (FY10): 5.18 $/kW, 12.19 mills/kWh, 29.62 mills/kWh
- 2015: 5.18 $/kW, 12.19 mills/kWh, 29.42 mills/kWh
### SLCA/IP Energy Generated
Percentages Based on FY 2018 Data

<table>
<thead>
<tr>
<th>Project</th>
<th>Generated - GWh</th>
<th>% of Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRSP</td>
<td>5,547,972</td>
<td>97.49%</td>
</tr>
<tr>
<td>Glen Canyon</td>
<td>4,050,661</td>
<td>71.18%</td>
</tr>
<tr>
<td>Flaming Gorge</td>
<td>628,820</td>
<td>11.05%</td>
</tr>
<tr>
<td>Aspinall</td>
<td>868,491</td>
<td>15.26%</td>
</tr>
<tr>
<td><strong>Participating / Integrated Projects:</strong></td>
<td>142,858</td>
<td>2.51%</td>
</tr>
<tr>
<td>Dolores</td>
<td>13,875</td>
<td>0.24%</td>
</tr>
<tr>
<td>Seedskadee</td>
<td>66,662</td>
<td>1.17%</td>
</tr>
<tr>
<td>Collbran</td>
<td>22,796</td>
<td>0.40%</td>
</tr>
<tr>
<td>Rio Grande</td>
<td>39,524</td>
<td>0.69%</td>
</tr>
<tr>
<td><strong>Total Generation:</strong></td>
<td><strong>5,690,829.56</strong></td>
<td><strong>100.00%</strong></td>
</tr>
</tbody>
</table>

CRSP MC Annual Customer Meeting
## SLCA/IP Energy Generated

### 5 Year Average per Project

<table>
<thead>
<tr>
<th>Year</th>
<th>Generated - GWh</th>
<th>5-yr Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>4,059,817</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>5,089,414</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>5,266,922</td>
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</tr>
<tr>
<td>2017</td>
<td>5,459,474</td>
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</tr>
<tr>
<td>2018</td>
<td>5,547,972</td>
<td>5,084,720</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>5-yr Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRSP</td>
<td>4,059,817</td>
<td>5,089,414</td>
<td>5,266,922</td>
<td>5,459,474</td>
<td>5,547,972</td>
<td>5,084,720</td>
</tr>
<tr>
<td>Glen Canyon</td>
<td>3,109,906</td>
<td>3,863,803</td>
<td>4,016,226</td>
<td>3,969,625</td>
<td>4,050,661</td>
<td>3,802,044</td>
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<tr>
<td>Flaming Gorge</td>
<td>361,789</td>
<td>504,135</td>
<td>495,226</td>
<td>781,596</td>
<td>628,820</td>
<td>554,313</td>
</tr>
<tr>
<td>Aspinall</td>
<td>588,123</td>
<td>721,475</td>
<td>755,470</td>
<td>708,253</td>
<td>868,491</td>
<td>728,362</td>
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</table>

### Participating / Integrated Projects

<table>
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<tr>
<th>Project</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>5-yr Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dolores</td>
<td>21,364.85</td>
<td>21,118.76</td>
<td>22,923.04</td>
<td>23,200.48</td>
<td>13,875.26</td>
<td>20,496.48</td>
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<td>Seedskadee</td>
<td>58,587.86</td>
<td>75,558.54</td>
<td>51,886.36</td>
<td>31,917.51</td>
<td>66,662.49</td>
<td>56,922.55</td>
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<tr>
<td>Collbran</td>
<td>43,754.13</td>
<td>39,247.68</td>
<td>41,069.46</td>
<td>37,760.25</td>
<td>22,795.62</td>
<td>36,925.43</td>
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<tr>
<td>Rio Grande</td>
<td>12,767.88</td>
<td>37,642.42</td>
<td>43,432.61</td>
<td>45,218.30</td>
<td>39,524.26</td>
<td>35,717.10</td>
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</table>

**Total Generation:** 4,196,292 | 5,262,981 | 5,426,234 | 5,597,570 | 5,690,830 | 5,234,781
Colorado Basin River Forecast Center
Lake Powell Group

06/07/2019 Percent Median: 601% (9.3 / 1.6)
Percent Seasonal Median: 57% (9.3 / 16.4)
3 Day Melt Rate: 0.4 in/day

Created 06/07.16:16 GMT
NOAA/CBRFC, 2019

Median 1981-2010  Average 1981-2010  2019  2018
# Annual Revenue Requirements

## Comparison Table (Tab 5)

### Values in 1,000’s

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>2017 Workplan</th>
<th>2021 Workplan</th>
<th>Amount</th>
<th>Percent</th>
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<tbody>
<tr>
<td><strong>Rate Setting Period:</strong></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Beginning year</td>
<td>FY</td>
<td>2016</td>
<td>2021</td>
<td></td>
<td></td>
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<tr>
<td>Pinchpoint year</td>
<td>FY</td>
<td>2025</td>
<td>2029</td>
<td></td>
<td></td>
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<tr>
<td>Number of rate setting years</td>
<td>Years</td>
<td>10</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Annual Revenue Requirements:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Expenses</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation and Maintenance:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western</td>
<td>1,000</td>
<td>$52,630</td>
<td>$60,190</td>
<td>$7,560</td>
<td>14%</td>
</tr>
<tr>
<td>Reclamation</td>
<td>1,000</td>
<td>$34,535</td>
<td>$35,420</td>
<td>$885</td>
<td>3%</td>
</tr>
<tr>
<td>Total O&amp;M</td>
<td>1,000</td>
<td>$87,165</td>
<td>$95,610</td>
<td>$8,445</td>
<td>10%</td>
</tr>
<tr>
<td>Purchased Power 1/</td>
<td>1,000</td>
<td>$10,280</td>
<td>$5,034</td>
<td>$(5,246)</td>
<td>-51%</td>
</tr>
<tr>
<td>Transmission</td>
<td>1,000</td>
<td>$10,421</td>
<td>$8,208</td>
<td>$(2,213)</td>
<td>-21%</td>
</tr>
<tr>
<td>Integrated Projects requirements</td>
<td>1,000</td>
<td>$8,610</td>
<td>$6,447</td>
<td>$(2,163)</td>
<td>-25%</td>
</tr>
<tr>
<td>Interest</td>
<td>1,000</td>
<td>$4,706</td>
<td>$5,069</td>
<td>$363</td>
<td>8%</td>
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<td>Other 2/</td>
<td>1,000</td>
<td>$14,587</td>
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<td>$(4,113)</td>
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<td><strong>Total Expenses</strong></td>
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<td>$130,842</td>
<td>$(4,927)</td>
<td>-4%</td>
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<td><strong>Principal payments</strong></td>
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<td>Deficits</td>
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<td>$0</td>
<td>$0</td>
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<td>Replacements</td>
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<td>Original Project and Additions</td>
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<td>$3,922</td>
<td>$(15)</td>
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<td>Irrigation 3/</td>
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<td><strong>Total principal payments</strong></td>
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<td>$52,284</td>
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<tr>
<td><strong>Total Annual Revenue Requirements</strong></td>
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<td>$183,873</td>
<td>$183,126</td>
<td>$(747)</td>
<td>0%</td>
</tr>
<tr>
<td><strong>(Less Offsetting Annual Revenue:)</strong></td>
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<tr>
<td>Transmission (firm and non-firm)</td>
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<td>$19,640</td>
<td>$21,662</td>
<td>$2,022</td>
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<td>Merchant Function 4/</td>
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<td>$9,487</td>
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<tr>
<td><strong>Net Annual Revenue Requirements</strong></td>
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<td>$147,178</td>
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<td><strong>Energy Sales 6/</strong></td>
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<td>5,223,885</td>
<td>152,081</td>
<td>3%</td>
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<td><strong>Capacity Sales</strong></td>
<td>kW</td>
<td>1,407,920</td>
<td>1,423,900</td>
<td>15,980</td>
<td>1%</td>
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<td><strong>Composite Rate</strong></td>
<td>mills/kWh</td>
<td>29.42</td>
<td>28.17</td>
<td>-1.25</td>
<td>-4.2%</td>
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## Expenses

**May 2019 Update**

**Values in 1,000’s**

<table>
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<tr>
<th>Item</th>
<th>2017 Workplan</th>
<th>2021 Workplan</th>
<th>Amount</th>
<th>Percent</th>
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<td><strong>Annual Revenue Requirements:</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Expenses</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Other 2/</td>
<td>$14,587</td>
<td>$10,474</td>
<td>($4,113)</td>
<td>-28%</td>
</tr>
<tr>
<td><strong>Total Expenses</strong></td>
<td>$135,769</td>
<td>$130,842</td>
<td>($4,927)</td>
<td>-4%</td>
</tr>
</tbody>
</table>
## Repayment
### May 2019 Update
Values in 1,000’s

<table>
<thead>
<tr>
<th>Item</th>
<th>WAPA 169</th>
<th>FY 2019</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2017 Workplan</td>
<td>2021 Workplan</td>
<td>Amount</td>
</tr>
<tr>
<td><strong>Principal payments</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deficits</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Replacements</td>
<td>$30,037</td>
<td>$39,841</td>
<td>$9,804</td>
</tr>
<tr>
<td>Original Project and Additions</td>
<td>$3,937</td>
<td>$3,922</td>
<td>($15)</td>
</tr>
<tr>
<td>Irrigation 3/</td>
<td>$14,130</td>
<td>$8,521</td>
<td>($5,609)</td>
</tr>
<tr>
<td><strong>Total principal payments</strong></td>
<td>$48,104</td>
<td>$52,284</td>
<td>$4,180</td>
</tr>
<tr>
<td><strong>Total Annual Revenue</strong></td>
<td>$183,873</td>
<td>$183,126</td>
<td>($747)</td>
</tr>
</tbody>
</table>
# Offsetting Revenues

## May 2019 Update

Values in 1,000’s

<table>
<thead>
<tr>
<th>Item</th>
<th>WAPA 169 2017 Workplan</th>
<th>FY 2019 2021 Workplan</th>
<th>Change Amount</th>
<th>Change Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Less Offsetting Annual Revenue:)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmission (firm and non-firm)</td>
<td>$19,640</td>
<td>$21,662</td>
<td>$2,022</td>
<td>10%</td>
</tr>
<tr>
<td>Merchant Function 4/</td>
<td>$9,918</td>
<td>$9,487</td>
<td>($431)</td>
<td>-4%</td>
</tr>
<tr>
<td>Other 5/</td>
<td>$5,118</td>
<td>$4,799</td>
<td>($319)</td>
<td>-6%</td>
</tr>
<tr>
<td>Total Offsetting Annual Revenue</td>
<td>$34,676</td>
<td>$35,948</td>
<td>$1,272</td>
<td>4%</td>
</tr>
<tr>
<td>Net Annual Revenue Requirements</td>
<td>$149,197</td>
<td>$147,178</td>
<td>($2,019)</td>
<td>-1%</td>
</tr>
</tbody>
</table>
## Revenue Requirements

**May 2019 Update**

Values in 1,000’s

<table>
<thead>
<tr>
<th>Item</th>
<th>WAPA 169 2017 Workplan</th>
<th>WAPA 169 2021 Workplan</th>
<th>FY 2019</th>
<th>Amount</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rate Setting Period:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beginning year</td>
<td>2016</td>
<td>2021</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pinchpoint year</td>
<td>2025</td>
<td>2029</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of rate setting years</td>
<td>10</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Expenses</strong></td>
<td>$135,769</td>
<td>$130,842</td>
<td>($4,927)</td>
<td>-4%</td>
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<tr>
<td><strong>Less Total Offsetting Annual Revenue</strong></td>
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<tr>
<td><strong>Net Annual Revenue Requirements</strong></td>
<td>$149,197</td>
<td>$147,178</td>
<td>($2,019)</td>
<td>-1%</td>
<td></td>
</tr>
<tr>
<td>Energy Sales 6/ MWH</td>
<td>5,071,804</td>
<td>5,223,885</td>
<td>152,081</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Capacity Sales kW</td>
<td>1,407,920</td>
<td>1,423,900</td>
<td>15,980</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>Composite Rate mills/kWh</td>
<td>29.42</td>
<td>28.17</td>
<td>-1.25</td>
<td>-4.2%</td>
<td></td>
</tr>
</tbody>
</table>
WAPA-169 Expires
30 September, 2020

• Same billing rates since 1 October, 2009
• Memorandum of Agreement Concerning the Upper Colorado River Basin Fund (FY 2011)
• Glen Canyon Cost Reallocation (FY 2013)
• FRN Changes under WAPA-169 (FY 2016):
  • CRC – WAPA Discretion and New Table with Tiers
  • Transmission – Forward Looking Investments
  • Unreserved Use Rate Schedule
Changes - FY2019 Preliminary PRS

- Unfunded Retirement Benefits, Actuary Adjustments:
  - FERS & CSRS
  - FEGLI (Life Insurance)
  - Health Benefits

<table>
<thead>
<tr>
<th>Total Unrecovered Retirement/FEGLI/Health Benefit Costs</th>
<th>FY14</th>
<th>FY15</th>
<th>FY16</th>
<th>FY17</th>
<th>FY18</th>
<th>5-yr Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMF-GGCR Colorado River Storage</td>
<td>65,733.06</td>
<td>67,712.71</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>26,689.15</td>
</tr>
<tr>
<td>VMF-JJCR CRSP</td>
<td>1,034,417.37</td>
<td>908,189.78</td>
<td>1,067,283.47</td>
<td>875,211.70</td>
<td>1,326,950.06</td>
<td>1,042,410.48</td>
</tr>
<tr>
<td>VMF-GGCR Colorado River Storage</td>
<td>333,338.36</td>
<td>295,323.49</td>
<td>233,069.51</td>
<td>174,640.77</td>
<td>282,360.55</td>
<td>263,746.54</td>
</tr>
<tr>
<td>WFF-LLAF Amistad/Falcon</td>
<td>825.29</td>
<td>694.45</td>
<td>1,127.63</td>
<td>801.23</td>
<td>1,197.25</td>
<td>929.17</td>
</tr>
<tr>
<td>WMA-LLCO Collbran</td>
<td>523.06</td>
<td>464.43</td>
<td>469.84</td>
<td>333.85</td>
<td>498.85</td>
<td>458.01</td>
</tr>
<tr>
<td>VMF-LLCR CRSP</td>
<td>446,321.70</td>
<td>396,283.12</td>
<td>400,214.39</td>
<td>284,372.24</td>
<td>424,922.11</td>
<td>390,422.71</td>
</tr>
<tr>
<td>VMF-LLDO Dolores</td>
<td>523.06</td>
<td>464.43</td>
<td>563.82</td>
<td>400.62</td>
<td>598.62</td>
<td>517.11</td>
</tr>
<tr>
<td>WMA-LLPR Provo River</td>
<td>627.68</td>
<td>557.32</td>
<td>563.82</td>
<td>400.62</td>
<td>598.62</td>
<td>549.61</td>
</tr>
<tr>
<td>WMA-LLRG Rio Grande</td>
<td>523.06</td>
<td>464.43</td>
<td>563.82</td>
<td>400.62</td>
<td>598.62</td>
<td>510.11</td>
</tr>
<tr>
<td>VMF-LLSE Seedskadee</td>
<td>485.26</td>
<td>478.79</td>
<td>563.82</td>
<td>400.62</td>
<td>598.62</td>
<td>505.42</td>
</tr>
</tbody>
</table>

Consolidated CRSP - JJCR+GGCR+LLCR                                    | 1,879,810.49 | 1,667,509.10 | 1,700,567.37 | 1,334,224.71 | 2,034,232.72 | 1,723,268.88 |
$4M per-year for Energy Management Office

- Year 6 of Purchase Power through end of study
- Removed
- New projection tools for Purchase Power remove the need for this
- Will document in upcoming Federal Register Notice
Rate Action Changes

• Transmission Rate
  • Currently – Only Forecasts Investments
    • Investments are projected through the current year
    • O&M and depreciation are based on prior year
  • Proposed Change
    • Forecast Operations & Maintenance
      - Pull data thru May and extrapolate thru fiscal year end
    • Forecast Depreciation
  • Sample – Build FY2021 rate off Projected FY2020 instead of Actual FY2019
Rate Action Changes

• Cost Recovery Charge (CRC)
  • Modify formula to include collection of revenue lost by decreasing allocations
  • Reductions to Capacity added
  • Plain Language Effort
  • Provide “Understandable” format in Customer Brochure

• Surplus Sales Rate Schedule
Rate Action Changes

- **Purchase Power**
  - 2 + 5 Projections (normal year)
  - 1 + 5 Final Rate (FY2021 – FY2025)

- **Projections Methodology**
  - Year 1 August 24-Month Study
  - Year 2-7 August Colorado River Simulation System (CRSS)
Proposal FRN Schedule (est.)

- Announce Rate Action – June 20, 2019
- Start routing - September 10, 2019
- DOE Review - October 21, 2019 (30 Days)
- Administrator Signs - January 6 - 8, 2020
- Publish Proposal FRN - January 14, 2020
- Start 90-day Customer Comment Period - January 14, 2020
- Public Information & Customer Comment Forums March 12, 2020
- End Customer Comment Period April 13, 2020
Next Steps

• Provo River Proposal FRN WAPA -189
  • In Process
  • Administrator signs in about 2-3 weeks
  • 30 day customer comment period (no forums)

• Revisit Provo River and Olmsted FY2020 Installments

• FY2020 Rates sent out by August 30, 2019
  • Transmission
  • Installments (Provo River, Olmsted, Falcon-Amistad)
  • WRP/CDP
CRSP MC Rates Team

Tim Vigil– Power Marketing Manager
   970-252-3005
   TVigil@wapa.gov

Thomas Hackett
  801-524-5503
  hackett@wapa.gov

Tony Henriquez
  801-524-6388
  thenriquez@wapa.gov

https://www.wapa.gov/regions/CRSP/rates/Pages/rates.aspx
Markets are here
Markets in the West Workshop, April 9-10
Energy Imbalance & Energy Imbalance Markets

Today: WAPA handles imbalance for its balancing authorities
- We use either hydro or bilateral agreements to handle EI
- EI calculated and priced hourly
- Region settles and bills each customer

Possible EIS Market Future: Market Operator handles imbalance
- Market Operator optimizes market resources to supply EI
- EI calculated and Locational Marginal priced every 5 minutes
- Market Operator does some or all settlement and billing
Why is WAPA interested in EIM?

Ensure reliable delivery of our hydropower while adjusting to a changing energy mix

- Respond to customer feedback requesting WAPA to lead organized market discussions
- Mitigate energy imbalance resource constraints
- Facilitate integration of variable resources
- Enable participants who want to optimize their resources
Energy Imbalance Service

• WAPA reviewed CAISO’s EIM in 2013
• WAPA received EIS proposal from SPP this week
  – Need to ensure reliable delivery of our hydropower in a changing energy landscape.
  – We are NOT joining a full market; we are looking at participation in an energy imbalance service.
  – Focus on longer-term solutions to meet our needs in a rapidly changing environment.
  – We will engage with stakeholders and document our decisions.
• WAPA’s considering CAISO’s EIM as well
  – Especially for Sierra Nevada
SPP Reliability Coordinator

- PEAK RC terminating RC services
- Parallel RC operations October and November
- SPP RC takes over Dec. 3, 2019
- Enables SPP to readily add market

Image credit: Adapted from NERC and WECC graphics
California ISO EIM (Western EIM)

- BANC became active participant this year
- SN’s sub-BA within BANC is evaluating options
SPP Western Energy Imbalance Service (WEIS)

June 17, 2019

SPP proposes Western Energy Imbalance Service Market to bring cost savings and grid modernization to the west

Southwest Power Pool (SPP) has announced to western utilities its proposal for the Western Energy Imbalance Service market (WEIS) it intends to launch in December 2020. The wholesale electricity market will balance generation and load regionally and in real time. SPP’s previous energy imbalance market went live in 2007 and provided participants with $103 million in benefits in its first year of operation.
SPP WEIS proposal

- Two meetings in spring 2019 on high-level design of WEIS
- SPP proposed market “go-live” Dec. 1, 2020
  - One year after RC “go-live”
- Additional market participants may be added at approximate 6-month intervals after go-live

Critical mass commitment
July 26, 2019

RC go-live
December 1, 2019

Imbalance Market go-live
December 1, 2020
SPP WEIS implementation cost

- $9.5M spread over 8 years; integrated into admin fee to all participants
- 4-year commitment
- Load ratio share of entire startup cost part of commitment (including years 5-8)
- Those that commit are obligated for startup costs expended if efforts fails
- If all of WACM, PSCO and WAUW BAs commit
  - CRSP MC admin fee estimated at ~$200k/year
Possible impacts to BA EI service

• Potential changes to Schedule 4 and 9 of OATT or BA contracts
  – EI ancillary rate changes would involve a Federal Register notice process and customer meeting
• Depending on implementation, this could entail a cost change of BA administration
WEIS Follow up Call

- WebEx call on June 25th, 1:00 to 3:00 MDT to discuss initial proposal for WEIS with SPP

- To receive an email invitation for the call, please contact:
  - Don Martin - Supervisor of Customer Relations
  - Phone: 501-614-3309
  - Email: DMartin@spp.org or customerrelations@SPP.org
Feedback desired

Send comments or concerns to:

Tim Vigil
VP of Power Marketing
TVigil@wapa.gov
(970) 252-3005
Regional Managers’ Update

Steve Johnson, Senior VP and CRSP Manager
Ron Moulton, Senior VP and DSW Regional Manager

June 20, 2019

CRSP Annual Customer Meeting
Salt Lake City, UT
Discussion & Comments
Thank you!