Program Exploration

Transmission Services
Agenda

- Introduction
- Planning and Asset Management
- Engineering and Technical Services, and Field Services
- Operational Systems and Commercial Efforts
- A Changing Industry
Transmission Lifecycle

- Invest in greater operational situational awareness or better state awareness
- Leverage technology
- Continue to install, maintain and troubleshoot Tx grid
- Invest in continuous improvements in processes and procedures, as well as talent skilling and training
- Improved processes that achieve and deliver certainty
- Safety by Design

- Continually develop and expand desired products to customers
- Extract full use and value of installed infrastructure
- Regional point of view
- Consider and integrate alternatives in planning process
- Balance risk with investing to save

System Operations
Commercial
Planning
Engineering
Field Services
Choices for the Future

Transmission Capital Reference Case
Asset Category
(with Indirects and AFUDC in $M)

Pressures
• Load service
• Renewable Portfolio Standards
• Aging infrastructure
• IT investments for asset optimization

Opportunities
• Emerging Markets
• Non-wires
• New products
• Technology

Bending the cost curve down (Illustrative)

Reference Case Expand Trajectory

Sustain  Expand
Transmission Services

PLANNING AND ASSET MANAGEMENT
Connections

Commercial

Planning  Engineering
A Changing Industry

- Key business drivers
  - Forecasted Demand
  - Impacts of Energy Markets
  - Generation Choices
  - National, Regional, and Local Policies
Our Infrastructure is Aging

Greater than 50% of the facilities were constructed prior to 1962.
Potential Transmission Investment Levels

Transmission Sustain and Expand 2014 Forecast

Includes Capital Indirects

*Work / Projects Not Included:
  - B2H - Boardman to Hemingway
  - M2W - Montana to Washington - CUP West
  - CUP East
  - NOS 2013
  - Gaelectric RAS need for M2W shift
  - All PFIA projects

Dollars

Fiscal Year

FY14 FY15 FY16 FY17 FY18 FY19 FY20 FY21 FY22 FY23

Expand Forecast
Core Sustain Forecast
Affordability Cap Total
Substation AC is one of the largest transmission programs at BPA with some of the most critical equipment on the system. It currently has a $700M+ backlog.
Improvements in Sustain Program Planning:
Prioritizing Sustain Programs based on Total Economic Cost
Expand Program Drivers

Example:
South of Allston system requirements
What are the gaps the Transmission Asset Strategy is focused on closing?

- Optimize lifecycle of assets
  - Improve the implementation of critical capital replacements
  - Reduce total economic costs
    - Get the most life out of the asset while managing risks

- Make process improvements
  - Integrate sustain program asset strategies
  - Prioritize replacements to meet budget limitations
  - Access to higher quality asset data
  - Implement portfolio management tools
    - Provide efficiency in the way we do our work
Transmission Services

ENGINEERING AND TECHNICAL FIELD SERVICES
Transmission Improvement Efforts

“Asset Management and Program Delivery” Initiative

Focusing on improving capabilities in the Acquire phase of the asset lifecycle and on Transmission asset information

Revised Asset Acquisition Lifecycle

Supported by improved asset data and information quality
Field Services

- Troubleshooting
- Preventative maintenance
- Event response

...Keeping the lights on while controlling costs
Transmission Services

SYSTEM OPERATIONS

COMMERCIAL EFFORTS
System Operations and Commercial Efforts

• **System Operations – *moving from reactive to proactive***
  - Investment in new technology to improve quality of service
    - Remedial action schemes, situational awareness tools, flow forecasting abilities, system operating limits (SOL) on demand, etc.
  - Regulatory requirements
    - Continued and increasing focus on cyber and physical security in addition to reliability areas

• **Commercial Efforts – *extracting full use and value from the wires***
  – Evolving products and services to meet customer needs
  – Investing in technology to provide better visibility of system use
  – Searching for ways to maximize use of assets without compromising reliability
Transmission Services

A CHANGING INDUSTRY AND CHOICES
A Changing Industry

- Key business drivers
  - Forecasted Demand
  - Impacts of Energy Markets
  - Generation Choices
  - National, Regional, and Local Policies
A Changing Industry

Today’s Facts:

* 50% of Transmission’s revenue requirement is for capital related cost

* There are over 9000MW of requests in the BPA queue for transmission service

* BPA Transmission contracts with roll-over rights are only a minimum of 5 years in commitment

* BPA sells unlimited hourly firm and non-firm on its network

* For January 2016, BPA’s e-tag volume was 152K
Choices Towards the Future

Today’s Facts:

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Implications:

* The more debt that is incurred the less nimble the rate can be to react to changes in the industry
* Getting in the queue is easy but may not reflect the long term commitment to pay for expansion
* Short term requests on the network are given the same status as long term when system conditions warrant cuts
* BPA’s transmission system is in the middle of regional transactions

Choices:

* Look at different options for asset expansion (non wires)
* Balance the risk of stranded assets with different funding mechanisms
* Develop more differentiated products, services and rate design
* Invest in situational awareness tools to minimize need for unnecessary margins – maximize system use
Financial Disclosure

This information has been made publicly available by BPA on February 12, 2016 and contains information not reported in BPA’s financial statements.