

WAPA Asset Management

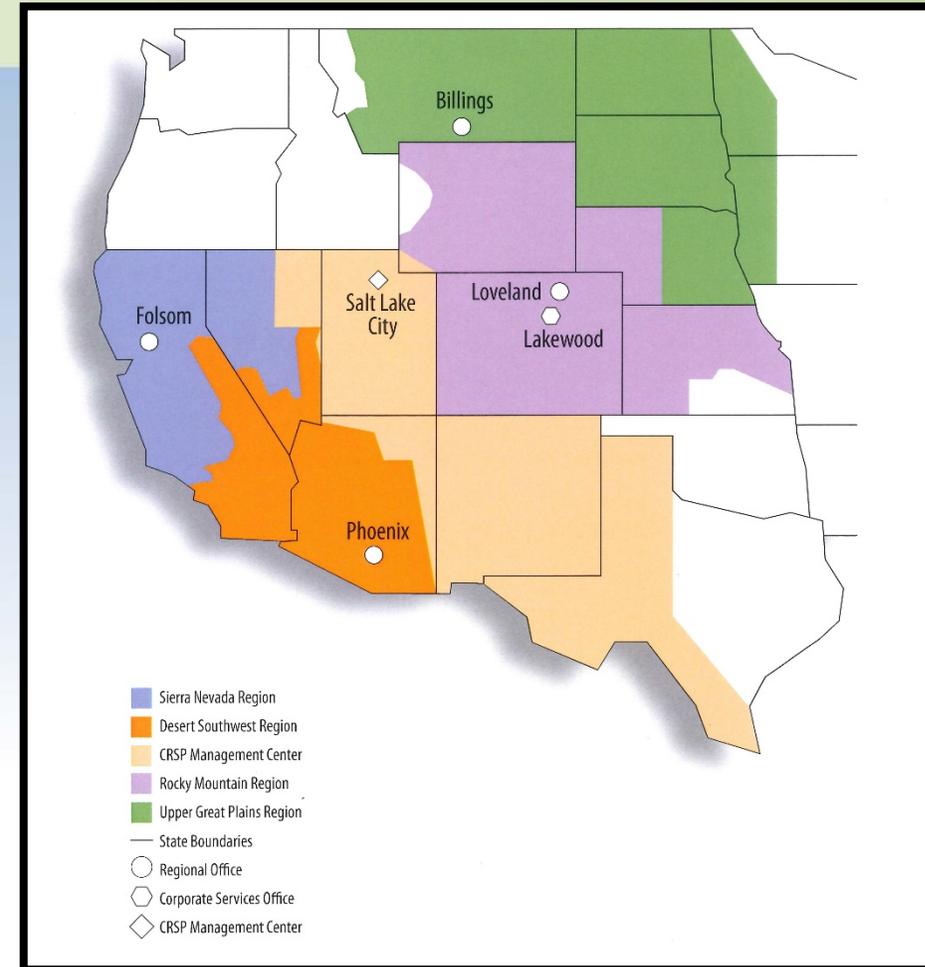
Chris Lyles

Technology and Security Symposium

August 21, 2018

WAPA Asset Overview

- 15 state footprint
- 17,360 miles of transmission
- Over 170,000 structures
- 316 substations
- Approx. 300 transformers
- Diverse Operating Conditions



Inception of Asset Management

- Project team established
- Formal AM program began in 2015
- 4 personnel at HQ, 5 regional support positions
- Primary focus was:
 - ✓ Transmission Lines
 - ✓ Power Circuit Breakers
 - ✓ Transformers



Determining Asset Health

- Maximo as an asset database and calculation tool
- Transformers
 - Age and Design
 - Oil Condition
 - Electrical Condition
 - Operational and Maintenance History
- Transmission Lines
 - Individual structure/hardware/conductor condition
 - Tline design and pole materials
- Breakers
 - Age/Design/Obsolescence
 - Maintenance History
 - Power System Stress



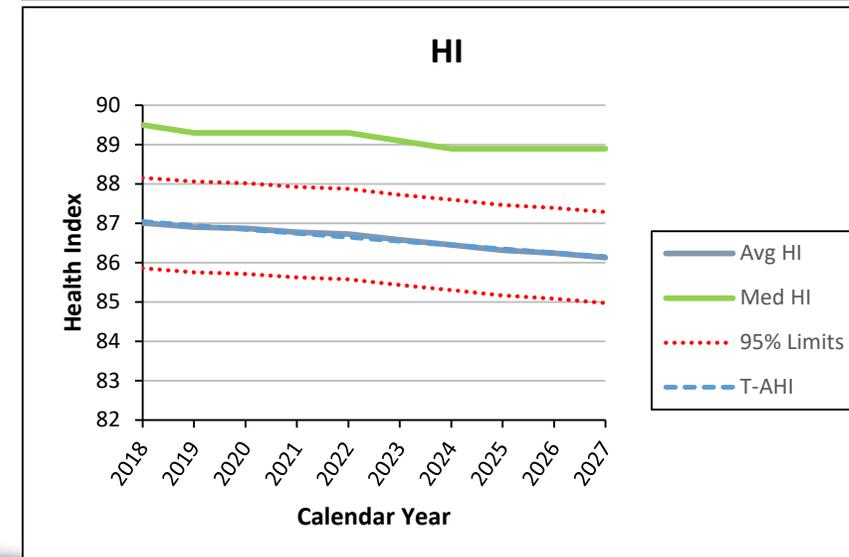
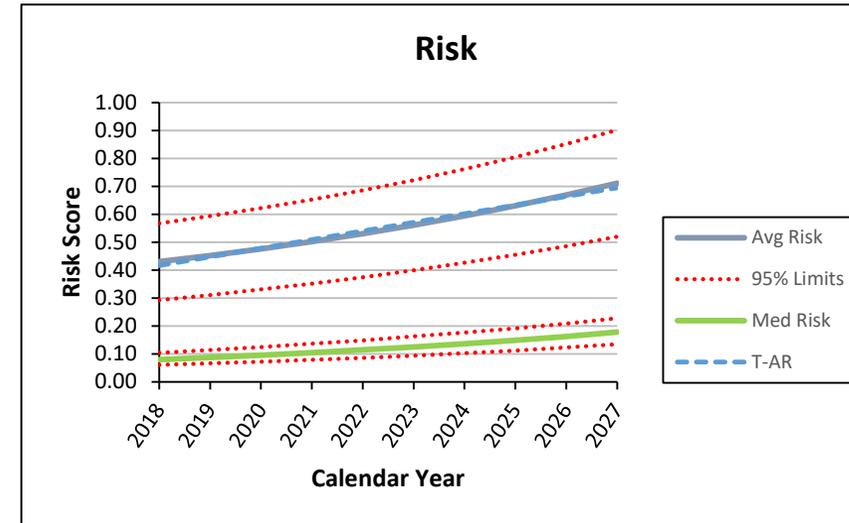
Determining Asset Risk

- Risk = Consequence X Probability of Failure (POF)

Metric	Weight	Description
Economic	42.5%	Economic Impact to WAPA power Customers (contracts & Tariffs Combined)
Asset Conceptual Cost	7.5%	Conceptual cost estimate to purchase failed equipment.
Critical Service	12.5%	Failure to provide expected electric service on a scale likely to produce an adverse action. Critical Service examples: hospitals, emergency centers, infrastructure, radial service
Tariff	10%	Delays in service, failure to meet OATT commitment, customer/FERC/DOE complaint, adverse action, litigation
Impact to Others	17.5%	Measure of impacts to other entities, Does not include direct WAPA customers.
Marketing	10%	Captures the importance of marketing contracts' obligations. Scheduling service, peaking/load following, critical scheduling hub, or ancillary service.

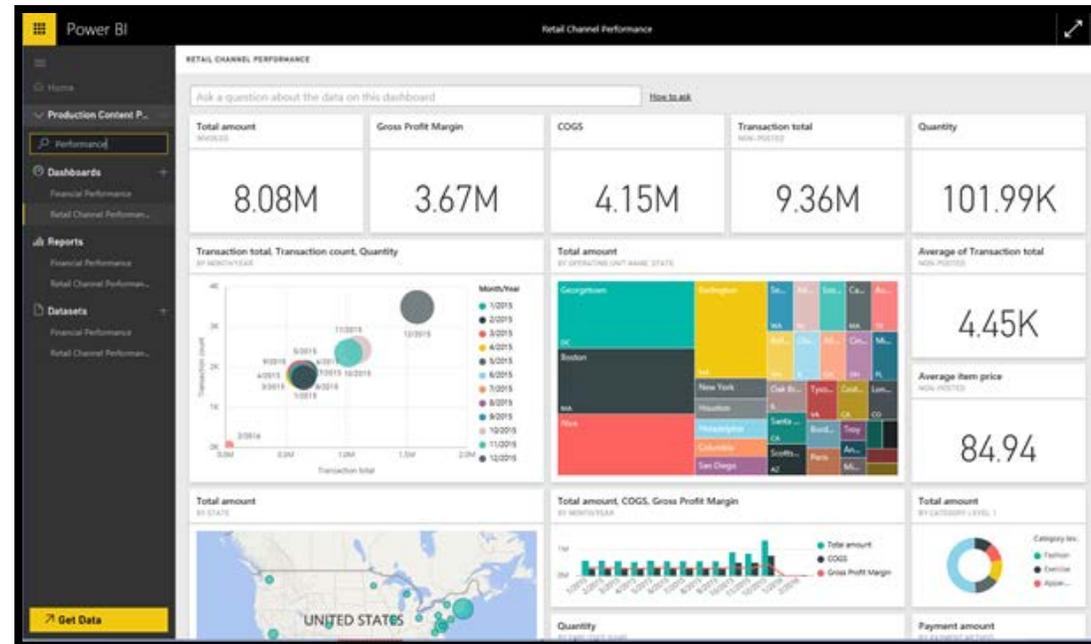
Asset Management Data

- Region specific and supports capital planning
- WARE Tool
- Data quality is imperative
- Moving toward visualization
- “State of the Assets” for each region



What's Next?

- Additional asset classes
- Improved visualization tools and senior manager reporting
- Communication plan to aid in information dissemination



Lessons Learned

- Culture shift
- Data in tabular format is bad for communication
- Perfecting asset health is time consuming
- Many uses for AM data...so you need to market it
- IT department is your best friend
- Maintaining data takes time
- Use industry experience. EPRI and NATF
- iOS or Android updates

Questions and Takeaways

- Questions??

- ✓ Ask Now

- ✓ Ask Later....lyles@wapa.gov OR 720-962-7249

- Takeaways

- ✓ WAPA calculations and factor weighting for asset health and probability of failure