

WUTC Workshop Docket U-161024

Pacific Power Distribution Planning
March 10, 2017



Let's turn the answers on.

Pacific Power

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- Scott Beyer, Director-Transmission Planning
- Heide Caswell, Director-T&D Asset Performance

Agenda

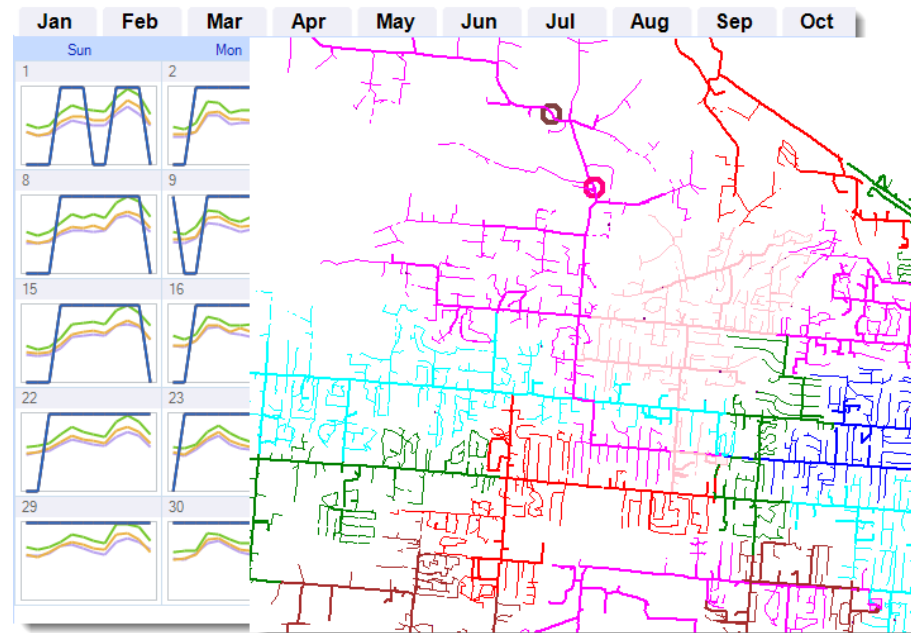
- Electric T&D Planning
 - Define
 - Tools
 - Process
 - Solution Selection
 - Examples/Experiences
 - DER Screening Tool
 - Energy Storage
 - Simplified California DRP
- Challenges
- Moving Forward

Electric T&D Planning-Define

- Distribution Planning Study (5 year)
 - Less than 35kV
 - Distribution Substation Getaway to End of Feeder
- Area Planning Study (10 year)
 - Distribution Substations
 - Sub-Transmission
 - Transmission
- Transmission Studies

Electric T&D Planning-Tools

- **Transmission**
 - Production cost model (GRIDVIEW)
 - Power flow model (PSS/E)
 - SCADA
 - PI Historian
- **Distribution**
 - Power flow model (CYME)
 - CYME Gateway (Data)
 - Reliability model (GREATER, FIRE)
 - SCADA
 - PI Historian
 - DER Screening tool
- **Customer**
 - Production/load resource meters
 - AMI meters (in certain jurisdictions)



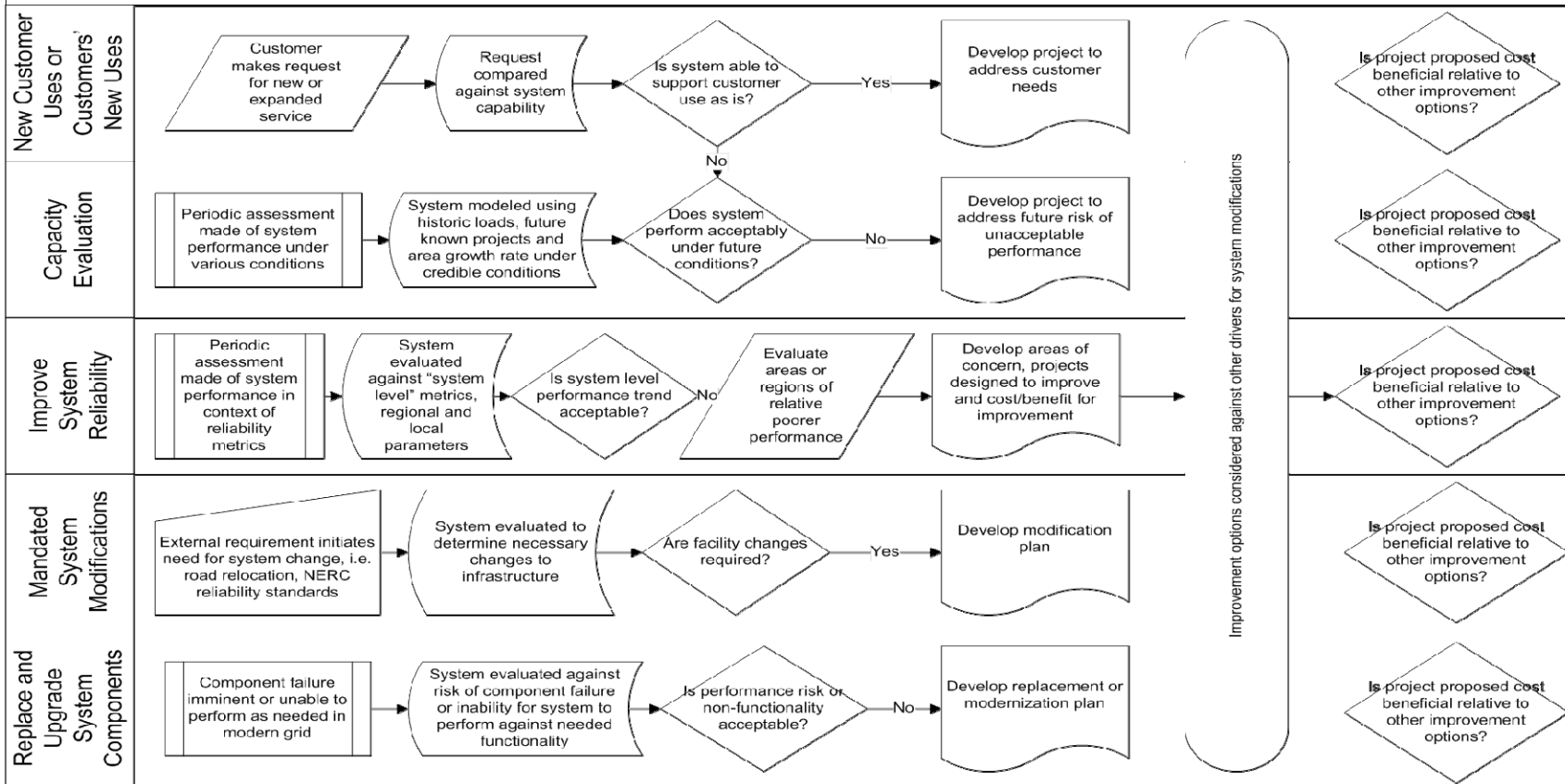
Electric T&D Planning

What drives the need?

- New Customer Uses
- Enhance system capacity
- Improve system reliability
- Perform work required by mandates
- Replace equipment/modernize grid

Electric T&D Planning-Process

Electrical Transmission and Distribution Facilities Planning



Electric T&D Planning-Solutions

- Improve Planning Information
- Improve System Operation
- Modernize the Energy Grid
- Enhance System Capacity
- Customer Solutions
- Utilize Advanced Technology

Electric T&D Planning-Screening

- Pacific Power Smart Grid Report 9/1/2016
 - DER Template Discussion (pages 14,15)
 - Appendix E DER Template (pages 46-63)
 - Solar
 - Solar and Energy Storage
 - DSM Alternative

Results Summary of DER Alternatives compared to Traditional Alternatives

Load Projections

Enter appropriate peak load of the facility being evaluated from SCADA or other data source.
 Enter year: Typically, the year of the treatment.
 Enter applicable % annual growth rate. Below, add known new spot loads not included in growth rate.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Determination of Projected Peak and Initial Determination of Minimum DER Output needed to achieve Target Facility Loading

DER Facility Rating	DER %	Planning Criteria	Proposed Peak Load (MW)	% Increase From Existing Peak to Proposed Peak	Target Facility Loading (MW)	Minimum DER Max. Output based on Projected Peak that equals or exceeds Planning Criteria
1.00	100%	5.00	5.00	0%	5.00	0.00

Base Assumptions

Minimum DER Max. Output based on Planning Criteria Loading: 0.00 DER MWs
 Safety Margin for minimum DER Max. Output (Default is 10%): 0.00 DER MWs
 (Note: This does not necessarily match the actual rating of the DER Alternative needed to achieve a Target Facility Loading.)
 Property Cost per Acre Estimate: \$1,000,000 Estimate

Solar Only Alternative

Is Solar Alternative possible? Yes No No
 Peak MW: 0.00 MW
 Peak MW: 0.00 MW
 Summary Cost Estimate for Solar Only Alternative: \$1,000,000 Estimate

Battery Only Alternative

Is Battery Alternative possible? Yes No No
 Peak MW: 0.00 MW
 Peak MW: 0.00 MW
 Summary Cost Estimate for Battery Only Alternative: \$1,000,000 Estimate

Solar & Battery Alternative

Is Solar & Battery Alternative possible? Yes No No
 Peak MW (use formula to refer to cell on Solar & Battery tab): 0.00 MW
 Peak MW (use formula to refer to cell on Solar & Battery tab): 0.00 MW
 Summary Cost Estimate for Solar & Battery Alternative: \$1,000,000 Estimate

DSM Alternative

Is DSM Alternative possible? Yes No No
 (Note: Peak loads are available only)
 Summary Cost Estimate for DSM Alternative: \$1,000,000 Estimate

Traditional Alternative

Response K2: Check A17 A18 between column A and B using Next inputs list.
 Summary Cost Estimate for Traditional Alternative: \$1,000,000 Estimate

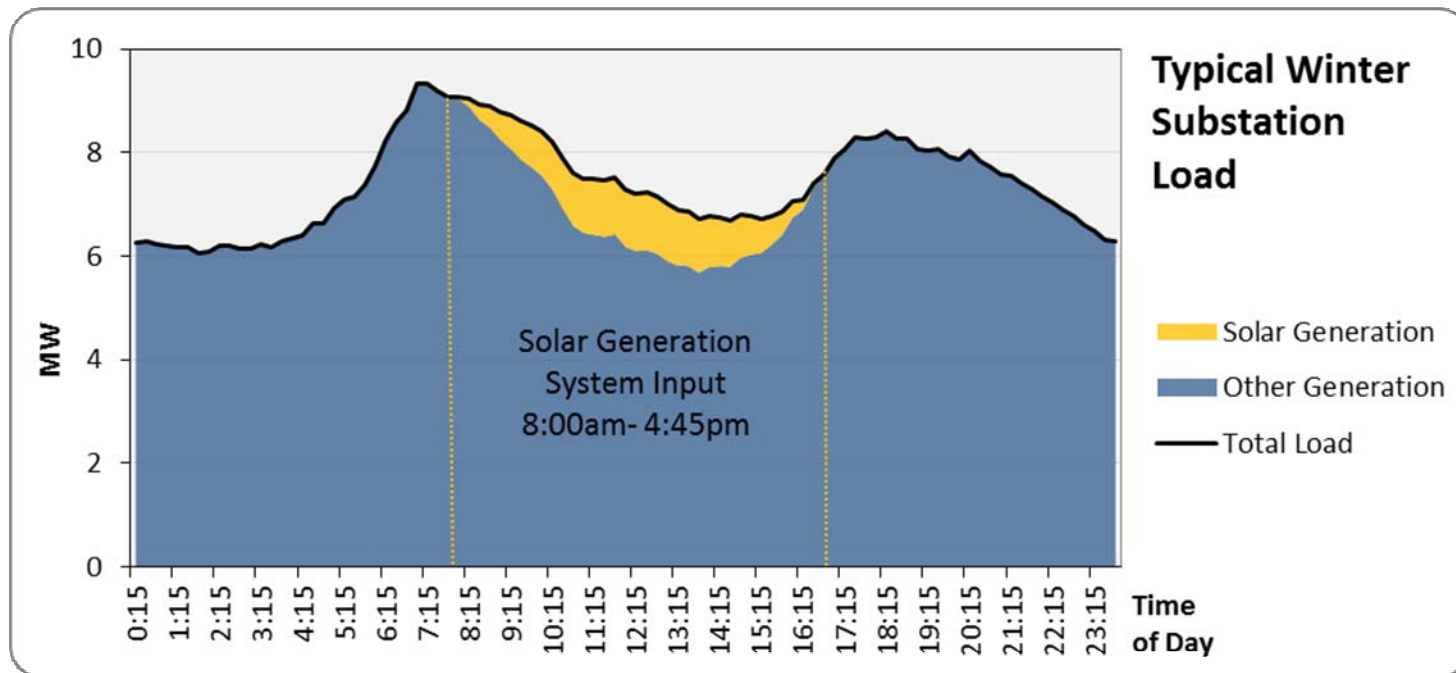
Electric T&D Planning-Storage

- Washington Clean Energy Fund 2 Discussion (page 17)
- Appendix G Washington Clean Energy Fund 2 Grant Application (pages 65-69)

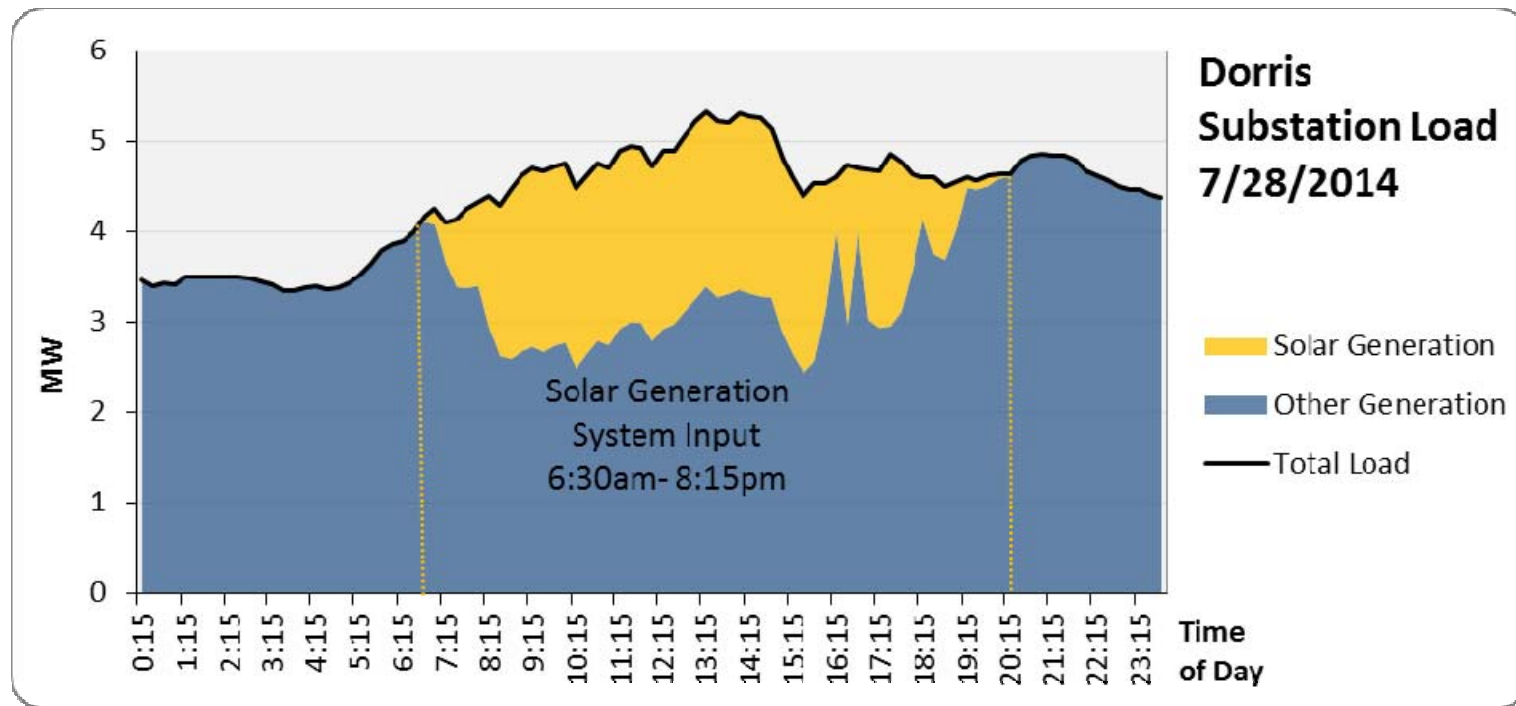


DRP Experience

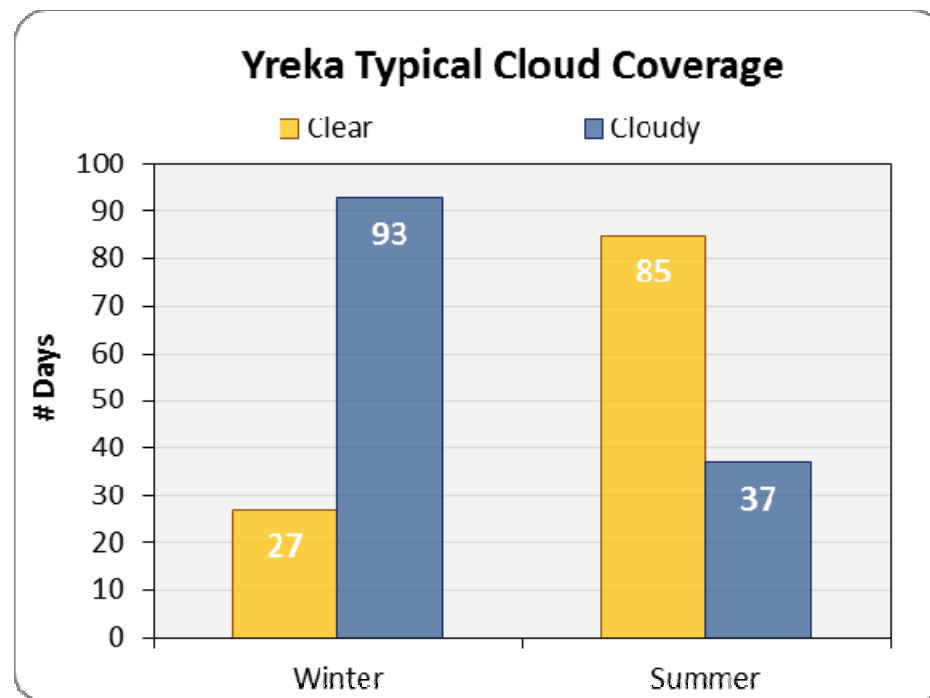
- California Simplified Distribution Resource Plan



DRP Experience

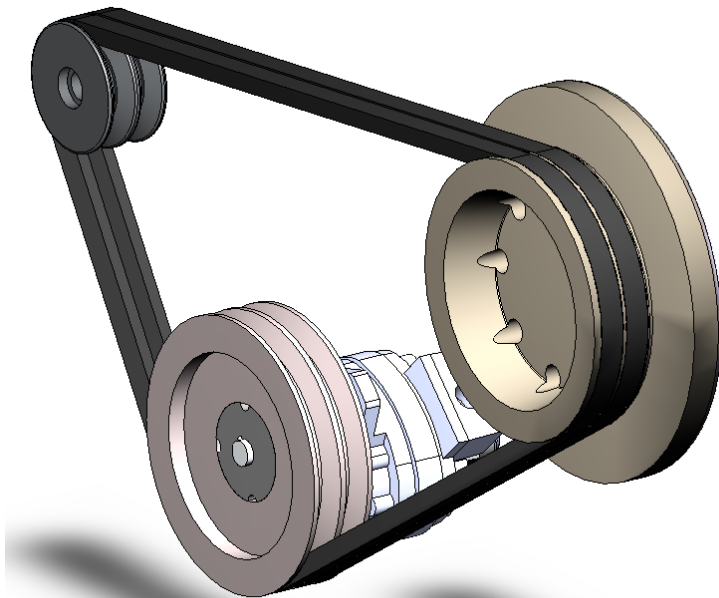


DRP Experience



Planning Challenges in the Future

Traditional Planning Approach:
required loose integration of
scenarios against which plans
are developed



Future Planning Approach:
requires tight integration of
scenarios against which plans
are developed



Challenges

- Preserve the quality of service to our customers
- Load Modeling
 - Variability in our customers' needs
 - Changes in forecasting methods and data sources
 - Interrelationship between energy sources and distribution planning decisions
 - Distribution Power Flow software is in its formative state
- Process and Policy
 - Distribution models become more critical
 - Technology rapidly evolving
 - Addressing emerging issues
 - Translating distribution into transmission planning
 - Pricing structures drive certain technologies

Moving Forward

- Develop margins for distribution planning
- Identification of relevant costs, risks, benefits
- Maintain focus on industry developments
 - Modeling tool developments in power flow software
 - Greater data needs now and in the future
 - Integration and interfaces between data sources and data uses is critical to ensure proper answers are developed
- Distribution models and application become more critical
- T&D Planning and the IRP
 - Distinct and Separate Requirements