CHELAN AREA
Transmission Line Fire Protection
September 4, 2018
Objective of this presentation:

We are not looking for a Board decision today.

The purpose of this presentation is to start the discussion of a potential fire protection project.

Project aligns with the District Strategic Plan.

GOAL: To achieve the greatest reliability for the Chelan area that the community supports.
Why we are here…

Chelan County PUD
Strategic Plan 2015 – 2019

Shaping our utility to do the best, for the most, for the longest

Reinvestment

Our customer-owners were most interested in replacing or rerouting some electric lines to protect against fire and weather risks. Other high-ranking items included partnering with some customers to underground electrical lines, consolidating Chelan PUD’s industrial facilities, and creating partnerships or programs to develop the skills of local job applicants. The Board confirms their commitment to reinvesting in the core, value-creating assets of hydro projects, distribution systems, facilities and people as the top priority and will use the Owner’s Guide (http://www.ourpublicpower.org/guide) feedback to help prioritize reinvestment options. Increased reinvestment projects and programs will be reflected in our

2018-2022 District-wide Business Plan

• Harden transmission system to protect against fire/weather
Fire Risk Assessment

Countywide Results – Highest Risk

1. Lake Wenatchee / Plain area
   • Working on solutions; very difficult area
2. Chelan – Wapato
3. York – Anderson Canyon Line 3
   • Being done in conjunction with Goodwin Bridge
4. Chelan – Manson
Fire Risk Assessment (2017)

Validated actual experience from the 2015 fire

Extensive damage in Area 2

Area 1: 18 miles of line; 210 structures
  • Geographic diversity (lines farther apart)
  • Configurability (able to sectionalize long sections of line for repair with minimal customer impact)

Area 2: 7.5 miles of line; 70 structures
  • Two lines are parallel for approximately 3.5 miles
  • Both lines burned at the same time in 2015 fire
  • Connection to the power source

Proposed Project Focus Area:
  • Area 2 provides greatest benefit to customer reliability
Operational Experience – 2015 Chelan Fire

• Fire caused an outage of 4 of the 5 substations in Chelan area, 8537 customers
• Twelve transmission structures on two different lines
• Significant customer impacts:
  ➢ Water, gasoline, internet, cell service, refrigeration, commerce, etc.
• 30 hours to repair the first transmission line
• 13 days to repair the second
Benefits of Steel Transmission Lines

- 2014 South Malaga fire, seven wood lines burn, one steel line maintains power to Alcoa
- 2018 fire near Rocky Reach, fire burns through steel line. The line remained in service the entire time

What if one of the Chelan transmission lines would have been constructed in steel?

- The line would have either remained in service the entire time, or
- Would have been de-energized for a short while to allow the fire to pass, then re-energized. Typically a matter of hours
Steel Pole Construction / Aesthetics

- Proposed projects replace wood poles with steel poles
- Same alignment as before
- Some poles may be taller
- Same general look and feel as original

(Center Structure below is steel)
The Chelan Loads

- Fed directly from Chelan Falls Switchyard near Chelan Hydro
- Four existing substations
- 8537 customers
- Future North Shore substation
- Large Irrigation Districts

CUSTOMERS SERVED

- WAPATO: 1,887 customers
- CHELAN: 3,104 customers
- UNION VALLEY: 2,431 customers
- MANSON: 1,115 customers

Future: NORTH SHORE
Approach 1: Replace only “Critical” Structures with Steel

Direct benefit: 0

Indirect benefit: 8537 customers (Chelan, Union Valley, Manson and Wapato Substations)

21 structures replaced
Low cost ($1.7 – 2.9 M)

2015 Fire Impacts if Steel
- Some wood structures may still need replacement
- Outage time 24+ hours
Approach 2: Rebuild to Chelan Substation

Direct benefit: 1115 customers (Chelan Substation)

Indirect benefit: 7422 customers (Chelan, Union Valley, Manson and Wapato Substations)

2.7 miles and 22 structures
Expensive ($2 – 3 M)

2015 Fire Impacts if Steel
• Outage time zero to a few hours
• If fire had been in the parallel section not constructed in steel, outage times would increase as structure replacement would be required
Aproach 3: Rebuild to Union Valley Substation

Direct benefit: 3546 customers
(Chelan and Union Valley Substations)

Indirect benefit: to 4991 customers
(Manson & Wapato Substations)

4 miles and 35 structures
Most expensive ($3 – 4.5 M)

2015 Fire Impacts if Steel
• Outage time zero to a few hours
Approach 4: Do Nothing

No project related costs ($0)

Poles are not at end of life

Wood structures remain

No reliability improvements, both lines remain at existing fire risk

Underground transmission is not a viable option
Customer Commitment

The District is committed to the following:

• Sharing detailed design information with the customer
• Collaborating - to the extent practical - to accommodate customer input
• Regular updates
• Ongoing discussions during design and construction
• GOAL: To achieve the greatest reliability for the Chelan area that the community supports
## Comparing Approaches

<table>
<thead>
<tr>
<th>Approach</th>
<th># of Customers Directly Benefited</th>
<th># of Customers Indirectly Benefited</th>
<th>Potential Downtime Reduction due to Fires</th>
<th>Project Cost</th>
</tr>
</thead>
</table>
| 1        | 0                                | 8537                                | • No substations served entirely from steel transmission  
• No geographic diversity benefit  
• Significant outage duration, dependent on fire severity. 24+ hours based on 2015 benchmark event | $1.7M - $2.9M |
| 2        | 1115                             | 7422                                | • 1 substation served directly from steel transmission  
• Reduced geographic diversity benefit  
• Outage duration none to several hours for fire safety | $2M - $3M |
| 3        | 3546                             | 4991                                | • 2 substations served directly from steel transmission  
• Other 2 substations benefit from geographic diversity  
• Outage duration none to several hours for fire safety | $3M - $4.5M |
| 4 (do nothing) | 0                                | 0                                  | • No reduction                                      | $0           |
Next Steps:

2018

Development of Customer Outreach Plan

Continue infrastructure protection evaluation efforts
First look at parcels which *might* see visual changes: