Upper Valley
Potential Electrical System Improvements
July - 2019
Desired Outcomes of Customer Outreach:

• Understand the history of the transmission system in the Upper Valley
• Share results of HDR fire risk assessment and customer impacts
• Understand the drivers of need for transmission system improvements
• Review options for hardening transmission infrastructure against fire risk and improving electrical reliability
• Community members provide direct feedback and ask questions
Applying **Lessons Learned** when Planning for New Infrastructure:

- Inform early and often
- Identify & weigh options in partnership with community stakeholders
- Proactively plan for immediate and long term needs
- Incorporate community values into planning
Your Input Today Helps Guide the Direction of the PUD

- We want you to weigh in on our recommended approach to fire resiliency plans
- We are seeking input on potential alternatives
- Your direct feedback will be shared with PUD Board of Commission
- Your input will be shared with future stakeholder groups & shape future outreach activities
The Electric Power System

The Electric Power System is divided into generation, transmission, and distribution.

1. Hydro Project
   In Chelan County, electrical power is generated at one of the PUD's three hydroelectric projects.

2. Transmission lines
   Transmission lines leave hydro projects and transmission switchyards.

3. Transmission Switchyard
   Power moves across large transmission lines to a transmission switchyard where electrical voltage is reduced by transformers.

4. Local Substation
   The power then travels along smaller transmission lines to a local substation, where the electrical voltage is reduced to an appropriate level for residential and commercial use.

5. Distribution lines
   Distribution lines leave local substations and may be overhead or underground depending on the location and situation.

6. Your home or business
   Finally, power travels along distribution lines and is converted to a standard voltage through transformers and into the customer's residence or business.
Types of power lines

We rely on a system of transmission towers and power lines to carry the electricity produced at our hydroelectric plants to the neighborhoods, homes, and businesses in the County.

Transmission lines
Transmission lines are the big, high voltage power lines that bring electricity from where it's made at our generating stations to substations near communities.

What's a kV?
kV stands for kilovolt, which is a unit of potential energy. One kV is equal to 1,000 volts.

Distribution lines
Distribution lines are the smaller, lower voltage lines that carry electricity from the substation to your home or business.

Transmission Line structures similar to these would be used...
The recommendation is to replace existing wood transmission poles to steel. Steel poles reduce the frequency and duration of fire-related transmission outages because fires will burn past them. The photo to the left is an example of a steel pole replacement.
**PUD objectives in the Upper Valley**

- Improve resiliency to fire and weather
- Improve access to utility infrastructure
- Provide reliable utility services

**PUD tactical plan in the Upper Valley**

- Harden the transmission systems by replacing wood poles with steel poles
- Relocate transmission line out of Sunitsch and Deadhorse Canyons
- Create redundancy with looped transmission – new transmission line between Plain and Lake Wenatchee substations
Mid 1990s
- PUD planned to construct a second 115kV line from Fox Rd to vicinity of Plain
- PUD ultimately cancels project due to opposition from Plain residents

2006
- Wind storm results in extended outages (Deadhorse Canyon)

2012
- Ice storm in the Plain and Lake Wenatchee area causes extended outages (~10 days off and on)
- Informal comments from Plain residents inquiring about the previous plan to construct a 115kV line

2017
- District assessed wildfire risk to transmission infrastructure
- Identified sections of Anderson Canyon, Coles Corner and Plain Tap at high risk

2019
- Outreach to Plain/Lake Wenatchee residents
Identified Plain/Lake Wenatchee area in top 3 highest risk areas of county.

PUD has desire to improve system resilience to wildfire and weather events.
• 2018 Cougar Creek fire burned approximately 41,104 acres in the Entiat Valley

• There are 3,400 customers in the Upper Valley
  • Coles Corner substation (323)
  • Lake Wenatchee substation (1,380)
  • Plain substation (1,710)

• If the transmission line serving this area were to burn with existing wood poles, it is possible customers would be without power for several months until repairs could be made
• Public safety
• Aging infrastructure
• Area of the forest that hasn’t burned in recent history
• Number of customers: 3,413
• Section in Sunitsch and Deadhorse Canyons
  • Difficult access in summer
  • Requires railroad assistance to access in winter
  • Narrow Right-Of-Way, trees are taller than the transmission line
Transmission Improvement Options – Alt. 1

• Rebuild existing line from Anderson Canyon, to Chumstick Hwy. to provide a hardened connection to the power source.

• Build new line along Chumstick, from North Road to Plain, for fire hardening and improved reliability

• Build new line between Plain and Lake Wenatchee Substations, creating a loop for improved reliability

• Estimated Cost $40M - $60M

• Map on next slide – full size PDF map on our website
Plain & Lake Wenatchee Reliability Improvement Project - Alternative 1 Proposal

This phase of the proposed project is to build a new transmission line segment from Plain Substation to Lake Wenatchee Substation.

This phase of the proposed project is to reroute the transmission line starting from where it crosses the Chumstick Hwy, then proceeding up the Chumstick and over to Plain Substation.

Proposed decommissioned 115 kV transmission line segments after project completion.

This phase of the proposed project is to rebuild the existing transmission line in the same alignment from Anderson Canyon Switchyard to Sunitsch Canyon (where the transmission line crosses Chumstick Hwy.)

LEGEND
- Substations and Switchyards
- New Transmission (Plain to Lake Wenatchee)
- New Transmission (Sunitsch Cyn to Plain)
- Potential New Transmission Route
- To Be Decommissioned
- Rebuild (Anderson Cyn to Sunitsch Cyn)
- Existing Transmission Lines
- Existing Distribution Lines
Transmission Improvement Options – Alt. 2 (see maps)

- Rebuild existing line from Anderson Canyon, to Chumstick Hwy. to provide a hardened connection to the power source.
- Rebuild the existing line through Sunitsch/Deadhorse
- Doesn’t resolve access issues
- Rebuild the existing Plain Tap
- Build a ring-bus at Coles Corner
- Estimated Cost $40M - $60M
- Map on next slide – full size PDF map on our website
This phase of the proposed project is to construct a ring bus transmission station at Coles Corner that will help improve reliability to customers.

This phase of the proposed project rebuilds the existing line in steel from Coles Corner to Plain.

This phase of the proposed project rebuilds the existing line in steel from Anderson Canyon to Coles Corner.

LEGEND

- Substations and Switchyards
- Rebuild (Coles Corner to Plain)
- Rebuild (Anderson Canyon to Coles Corner)
- Existing Transmission Lines
- Existing Distribution Lines
Transmission Improvement Options – Alt. 3

- Maintain status quo – Do Nothing
- Does not address risk of aging infrastructure
- Does not address risk of extended outages due to fire or weather
Transmission Alternatives: Pros & Cons

Alternative 1*

Pros:
• Easy access to structures
• looped service to substations
• Supports 2015-2019 Strategic Plan
• Provides greatest sectionalizing capabilities of all options

Cons:
• Requires new easements/permits
• More visible to customer owners
• Longer time to construct and energize, 8 – 10+ years

Estimated Cost: $40-$60M

Alternative 2*

Pros:
• Easements already in place
• Shorter time to begin construction
• Supports 2015-2019 Strategic Plan

Cons:
• Difficult access remains to Sunitsch and Deadhorse canyons.
• Does not provide “looped” service to Plain or Lake Wenatchee
• Longer repair times due to access

Estimated Cost: $40-$60M

Do-Nothing Alternative

Pros:
• Delays costs of upgrading to a future year

Cons:
• Risk of extended power outages due to wildfire and weather
• Risk of aging infrastructure

*These proposed resilience projects are not a revenue source
• Drop-in sessions
  • July 17 – 3:30 – 5:30 p.m. – Beaver Valley Lodge
  • July 27 – 10 a.m.-Noon – Leavenworth PUD Office, 222 Chumstick Hwy.
• Email updates to distribution list – SIGN UP ON OUR WEBSITE
• PUD Commission update – Fall 2019
• Assessment of community input
• Decision on how to proceed by the end of 2019
Questions?

www.chelanpud.org/UVTransmission
www.chelanpud.org/firehardening

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