PacifiCorp Planning
PacifiCorp Transmission Planning Studies

• Integrated Resource Plan
• NERC TPL-001-4 Annual System Assessment
• Local Area Transmission and Subtransmission Five Year Studies
• Generation Interconnection Requests
• Transmission Service Requests
Integrated Resource Plan and Transmission

• Wind and solar resources are locationally specific
• Locational resources can drive the need for new transmission lines
• Development of resources takes 1 to 2 years, development of transmission can take as long as 10 to 14 years or more
• Timing disconnect drove PacifiCorp to include transmission in the resource plan
• PacifiCorp planning works with the resource planning team to provide transmission needs associated with possible resource additions by location prior to any scenario analysis
• Transmission information is included in the resource plan scenario analysis in development of the preferred portfolio
Integrated Resource Planning Process

- Load Forecast
- Gas & Market Price Forecast
- Topology
- Existing Generation Assets
- Potential Resources

Input Interface

System Optimizer (SO)

SO Expansion Plan

Planning & Risk (PaR)

50 Iterations

Results Output
Transmission Projects and Drivers

Transmission Line and Substation Projects
- TPL Assessment and Five Year Study
- Large load and resource requests
- Neighboring utilities
- Enhance system capacity
- Improve system reliability

Replacing Equipment (transformers, circuit breakers, disconnect switches)
- TPL Assessment and Five Year Study
- Existing or New customer load growth
- Aging or obsolete equipment
- Neighboring utilities
- Modernize grid
TPL-001-4 Annual Transmission Planning Assessment

- The assessment evaluates system performance under the conditions defined in NERC TPL-001-4 mandated by FERC/NERC/WECC.
- 1, 5 and 10 year horizon focusing on the Bulk Electric System (BES) 100 kV and above.
- Bus level topology, peak and off-peak snapshot cases.
- Projects developed from this assessment are critical for the reliability of the BES and required to comply with NERC TPL performance standard.

- Prevent system performance issues (thermal overloads, voltage concerns and stability) that could potentially lead to widespread outages across an interconnection
- Contingencies based on severity of impact, not probability of event
- Reducing customer outage frequency/duration is not a focus of the Standard requirements
NERC TPL – Oregon Projects

• Transmission Transformer Capacity
  • Sams Valley 500-230 kV Substation
  • Grants Pass 230-115 kV Capacity Increase and Reconfiguration
  • Driscoll 230-115 kV Transformer

• Transmission Line Capacity
  • Medford Area 230 kV
  • NE Portland 115 kV

• Bus Configuration Changes
  • Malin 230 kV breaker addition
  • Hazelwood 115 kV ring bus and tie line upgrade
  • Roundup (Pendleton) 69 kV configuration

• Other
  • Meridian RAS Expansion
  • Circuit Breaker Fault Interrupting Capability
Local Area Transmission and Subtransmission Planning

Area Planning – Five Year Studies

- Five year horizon focusing on distribution substation, sub-transmission 115 kV and 69 kV.
- Local system models are created using “natural” load growth and minor sensitivities for block loads additions.
- This study is used to evaluate the local system against PacifiCorp, NERC and WECC operability and reliability criteria.
- Projects developed from these studies are mainly related to transmission operations, serving customer load growth, customer reliability and flexibility for restoration.
Area Planning Studies – Oregon Projects

• Transmission Line Capacity
  • Bend Area 69 kV
  • Corvallis Area 115 kV
  • Hood River Area 69 kV
  • Klamath Falls Area 69 kV
  • Lebanon Area 115 kV
  • Lyons – Santiam Area 69 kV
  • Warm Springs – Madras Area 69 kV

• Distribution Substation Transformer Capacity Increase
  • Approximately 20 substation transformer projects in Oregon planned across 10-year horizon.