



NW Natural

NW Natural's Perspectives on Seismic Preparedness and The Oregon Resilience Plan

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NW Natural's Commitment to PL Safety and Seismic Preparedness

- NW Natural owns and operates 630 miles of natural gas transmission lines and 13,600 miles of distribution mains to serve over 680,000 customers
- Company is committed to the safe, reliable and cost-effective delivery of natural gas to our customers
- Company has made significant progress toward improving the seismic resilience of the natural gas infrastructure
- Committed to further improving our resilience in a reasonable, practical, cost effective manner that recognizes impacts to utility ratepayers

NW Natural's Enhanced PL Safety Programs

- Distribution Integrity Management Program-1983
- Cast Iron Replacement Program-1983 to 2000
- Bare Steel Replacement Program-2001 to 2021
- Natural Forces (Geo-Hazard) Program-2001
- Transmission Integrity Management Program-2002
- System Integrity Program (SIP- Bare Steel Replacement, TIMP & DIMP)- 2009
- Distribution Integrity Management Program- 2011

NW Natural Transmission and Distribution Piping Characteristics

- Essentially 100% of NW Natural's underground infrastructure is constructed of modern day materials (steel and polyethylene plastic) that have a high amount of ductility (flexibility) to respond favorably to a seismic event
- Considerable research from previous earthquakes has concluded that modern arc-welded steel and polyethylene plastic pipelines perform very well during seismic events
- Geotechnical engineers have evaluated the entire transmission line system

NW Natural's Path Forward to Further Improve Seismic Resilience

- Strategy based on improvements to critical facilities in conjunction with effective response
- Identification of Critical Energy Infrastructure (CEI) facilities. Evaluate potential vulnerabilities and develop mitigation plans
- Install Remote Control Valves (RCVs) at critical locations to facilitate effective response
- Expand use of Excess Flow Valves (EFVs)
- Mutual Aid Agreements provide ready access to qualified workers, materials and equipment

Critical Factors for Effective Response to a Major Seismic Event

- Effective coordination with other stakeholders
- Timely restoration of service by interstate natural gas transmission supplier
- Transportation infrastructure available to energy sector
- Liquid fuel available to energy sector
- Communication systems available to energy sector
- Statutory relief / waiver from routine permit requirements

Summary

- NW Natural's Enhanced Pipeline Safety Programs have significantly improved both pipeline safety and seismic resilience
- New and replaced pipelines/facilities are designed to a high level of seismic resilience
- NW Natural will implement additional actions to further improve seismic resilience with support from regulatory agencies
- Mutual Aid Agreements with many US companies will facilitate effective response and restoration efforts