Oregon
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June 25, 2013

Senate Committee on Veterans and Emergency Preparedness
House Committee on Veterans' Services and Emergency Preparedness

Dear Senator Boquist, Representative Matthews, and Members,

Last week, during the third briefing session regarding the OSSPAC report, Representative Witt expressed concern about natural gas pipelines and the risk of catastrophic failure or indefinite release of gas should a pipeline rupture during a 9.0 seismic event. He also asked if information was available from any of the recent worldwide seismic events regarding performance of automatic shut-off valves.

I asked NW Natural to provide a more complete response for Representative Witt and your committee members. What follows are Staff's questions and NW Natural's responses.

Background on NW Natural Pipeline Safety and Seismic Preparedness-

NW Natural is committed to the safe, reliable and cost-effective delivery of natural gas to our customers. The company has worked closely with the OPUC Staff since 1983 to design and implement Enhanced Pipeline Safety Programs that exceed applicable federal pipeline safety regulations. For example, in 1983 NWN initiated a Cast Iron (CI) Replacement Program that was completed in October 2000. In 2001, the company worked with Staff to implement a Bare Steel Replacement Program and a Natural Forces (Geo-Hazard) Program. NW Natural expects to complete the Bare Steel Replacement Program in 2015. As a result of these Programs, the company has made significant progress toward further improving the safety of our natural gas infrastructure. In addition, these Enhanced Pipeline Safety Programs have improved the resilience of the piping infrastructure to respond favorably to a major seismic event, such as a 9.0 Cascadia earthquake, by eliminating piping materials that may be susceptible to damage from land movement. Essentially 100% of NW Natural's piping current infrastructure is constructed of modern day materials that have a high level of ductility and are therefore very resistant to damage from a seismic event.

OPUC Staff Question to NWN – Please provide a description of the basic valve types.

NW Natural Response-

NW Natural installs valves on its transmission and distribution pipelines in accordance with the provisions of 49 CFR, Part 192. These valves facilitate the company's routine operation and maintenance (O&M) activities as well as allowing the company to shut down a section of main or service line in the event of any type of emergency. The company uses manually operated shut-off valves, automatic shut-off valves (ASVs) and remote control shut-off valves (RCVs) on its system.

While the valves themselves are identical, the distinction is how the valves are operated. Each of the three valve operation scenarios has unique pros and cons- there is no perfect operating solution. An explanation of the three type of valve operators is as follows;

Manually operated valve - As the name suggests, a manually operated valve requires a company crew to travel to the valve location and operate (open or close) the valve manually with a valve key.

Automatic Shut-off Valve (ASV) - A valve that has a powered actuator to close the valve automatically based on data sent to the actuator from pipeline sensors. The sensors send a signal to close the valve based on pre-determined criteria, such as pipeline operating pressure or flow rate. The ASV does not require human evaluation or interpretation of information surrounding an event to determine if the event is a legitimate pipeline issue. It closes automatically based on established criteria. As a result, false (unjustified) closures, and the unintended consequences to customers are a significant concern associated with the use of ASVs.

Remote Control Valve (RCV) - A valve equipped with an actuator to operate (open, throttle or close) the valve based on an order (signal) from a remote location, such as a control room. RCVs require that reliable commercial power and telecommunications are available at the valve location. The use of a RCV requires operating personnel in the remote location to review and evaluate data in their pipeline system and make a determination whether a pipeline issue exists, based on available information. If the gas controller determines that there is a problem that requires valve operation, they may execute a command to operate the valve.

OPUC Staff Question to NWN – Please discuss where each type of valve is currently used (including what you know of interstate pipelines that are servicing Oregon).

NW Natural Response-

NW Natural has literally thousands of designated emergency shut-off valves throughout the system to facilitate an orderly and timely shut-down in response to any type of emergency event. Company personnel visit each location annually, not-to-exceed 15 months, to perform maintenance and ensure that the emergency valves are readily available to operate in the event of a pipeline event. The vast majority of these valves are manually operated, but the company has a number of ASVs and RCVs located on the transmission line system. Due to key distinctions between gas transmission systems and distribution systems, NWN (and the industry) only install ASVs and RCVs on gas transmission pipelines. Cost is a consideration. The cost to install a new ASV or RCV in an existing gas transmission pipeline ranges from approximately $200,000 to $2,000,000 per valve depending on a number of factors. (Note: I am unable to speak for the interstate pipeline operators).

OPUC Staff Question to NWN – Please provide a general overview of how NWN is prepared to respond in the event of a catastrophic event.

NW Natural Response-

NW Natural has policies, procedures and protocols to support the company's timely response to any type of emergency ranging from a third party excavation damage to a 9.0 earthquake event. Based on the fact that NW Natural's pipeline infrastructure is constructed almost entirely of state-of-art material that

has a high degree of ductility (flexibility), and therefore resistance to land movement, the company's system is expected to perform very well in the event of a major earthquake event. There is considerable literature that suggests modern day materials have performed exceptionally well in major earthquakes, including the most recent 9.0 earthquake in Japan. In the event that there is a pipeline damage due to a major soil displacement, the company would close one or more of its many strategically located emergency valves to stop the release of gas, and then proceed with necessary repairs. Natural gas enters into NW Natural's system from a discrete number of locations. If necessary, the company could close valves at a specified gate station. The company would not anticipate any scenario where "gas would flow, or be released indefinitely".

OPUC Staff Question to NWN - What you know of performance of auto and remote controlled valves in other worldwide earthquake incidents.

NW Natural Response-

As noted in the response above, there is considerable literature that has analyzed the performance of natural gas pipelines in recent seismic events. This literature has found that modern day materials (coated, cathodically protected, welded steel and also current polyethylene pipelines) perform very well in major seismic events, including the recent earthquake in Japan. I am not aware of any literature that specifically discusses the performance of ASVs or RCVs in major seismic events, perhaps due to the fact that the pipelines performed well and there was no need to shut them down. As noted in an earlier response, there are considerable pros and cons associated with the use of ASVs and RCVs on gas transmission systems.

Please contact me at 503-378-8225 or lori.koho@state.or.us if you have additional questions.

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