

# UTC Incident Investigation Form

<b>Notification ID:</b>	3139 NRC# 1177100	<b>Investigation ID:</b>	7509
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<b>Inspector Name:</b>	Derek Norwood (Lead) Dave Cullom (Staff Assist)
<b>Date Report Submitted to Chief Engineer:</b>	December 18, 2017
<b>Date Report Reviewed &amp; Approved by Chief Engineer:</b>	December 21, 2017

<b>Operator:</b>	Northwest Pipeline LLC (Williams)
<b>District/Unit:</b>	Redmond District
<b>Locations:</b>	15209 24 <sup>th</sup> Street East
<b>Incident Date:</b>	March 29, 2017

<b>Description:</b>
On Wednesday March 29, 2017, Williams received high pressure alarms at the North Tacoma Meter Station in Sumner. The high high alarm set point was 280 psig. Williams' District Manager arrived on site and found that the primary regulator at the station had failed open. This failure caused the pressure relief valve to relieve gas. Williams calculated that 21 MMSCF of natural gas was lost during the incident.
<b>Facts/Chronology of Events:</b>
<ul style="list-style-type: none"> <li>• 10:01 AM Williams received the high pressure alarm</li> <li>• Sometime between 10:09 AM and 11:15 AM Williams' personnel arrived on site</li> <li>• 11:15 AM the primary regulator was isolated which stopped the relief of gas.</li> <li>• Williams' Operations Technician removed and replaced the primary regulator components</li> <li>• 12:14 PM North Tacoma Meter Station is returned to normal operation</li> </ul>
<b>Causes/Contributing Factors:</b>
The axial flow regulator sleeves show indications of two separate failure methods: erosional failure ("vampire bit") and manufacturing inclusion. The vampire bit (shown below), is seen in flexible element regulators when there is a high differential pressure and low flow rates. The flowing surface area is reduced and vibrates rapidly between the sleeve and the cage creating a heat zone that causes the rubber to fail.

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According to Williams, the manufacturer inclusion has also been present in several of the failed boots. The manufacturer (American Meter) informed Williams that the chemical make-up of the sleeve has changed due to some of the chemicals in the rubber no longer being in production. American Meter thought they sourced acceptable replacements with the newly designed sleeves they provided. The newly designed sleeves were installed and were the sleeves that failed. The sleeve failed after 9 days of service. American Meter also communicated to Williams that they were experiencing about 25% pass rate on internal QA/QC of the sleeves. The most recent sleeve failure has been sent back to the vendor for failure analysis.

### **Regulatory Analysis/Violations:**

#### *49 CFR 191.5 Immediate notice of certain incidents*

Williams did not report this incident initially because the released gas was vented through a pressure relief valve as intended. However, PHMSA has concluded that these types of releases must be reported unless the relief was the result of regular operations and maintenance (O&M) tasks. Since this release was the result of a failed boot in the regulator, and not a regular O&M task, it must be reported within 1 hour.

Williams Incident Reporting Matrix now includes a note (Note 2) saying that these types of events will be reported in accordance with 49 CFR 191.5.

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**Note 2 - Guidance for determining reportable incidents from a relief valve activation or ESD/EBD venting:**

Release of gas from a relief valve, ESD/EBD venting, or other safety device is considered a DOT reportable incident if it results from a failure of the device or from another equipment failure AND results in a release of at least 3 million cubic feet (3 MMCF) of gas, even if the device is operating properly. Activation of these devices during testing or other routine maintenance is not considered a reportable incident, even if gas loss exceeds 3 MMCF.

**Follow up/Recommendations:**

Staff agrees with Williams follow up in response to this incident. Williams has replaced the sleeves at North Tacoma Meter Station and South Seattle Meter Station. They have also adjusted the differential pressure across the meter stations to reduce stress on the sleeves by allowing the allowing a wider operating range. Along with replacing regulators and adjusting pressures, Williams has converted and commissioned both stations to worker monitor configurations as of July 13, 2017. Although no other meter stations use the same size sleeve from American Meter, Williams is continuing to monitor other stations that have axial flow regulators.

Along with physical changes to the meter stations, Williams has adjusted their procedures to reflect PHMSA interpretations of code. At this time, staff does not recommend further compliance actions based on our belief that Williams' actions subsequent to the incident are sufficient measures to mitigate a reoccurrence of this event.