



University of Calgary. I am a member of the Association of Professional Engineers and Geoscientists of Alberta, the American Society of Mechanical Engineers, and the Institute of Electrical Electronics Engineers. I sit on the board of the Common Ground Alliance, which is a U.S.-based non-profit organization that promotes the importance of safe excavation around utilities.

**3. Have you provided rebuttal testimony in this proceeding?**

Answer: Yes, I have.

**4. Which witness's rebuttal testimony are you responding to in your surrebuttal?**

Answer: I am responding to portions of the rebuttal testimony of Evan Vokes.

**5. Were there any regulatory non-compliances issued by the Pipeline and Hazardous Materials Safety Administration related to the Special Conditions on the Gulf Coast Pipeline Project?**

Answer: No, TransCanada was not issued any notices of probable violations by PHMSA. TransCanada did receive two Warning Letters from PHMSA. The first, issued September 10, 2013, related to pipe installation in the ditch and protection of existing pipeline coating from potential damage due to the welding. TransCanada provided a detailed response to PHMSA on October 24, 2013 pointing out that TransCanada had constructed Gulf Coast to the same rigorous Special Conditions that will apply to KXL. One of the Special Conditions requires implementation of a performance-based quality assurance (QA) program. The intent of the program is to ensure that all potentially injurious construction or manufacturing-related defects are identified and remedied prior to placing the pipeline into

service. TransCanada had voluntarily reported to PHMSA the two areas of concern identified in PHMSA's letter and the fact that they were discovered by the secondary, post-installation QA program shows that the process works. The QA program functioned as intended to allow the coating damage and pipe body dents described in PHMSA's letter to be identified by TransCanada and repaired prior to placing the pipeline into operation.

The second Warning Letter issued on September 26, 2013 and expressed concerns regarding the manual welding process used on Spread 3 of the project. In addition to the prior 12 months of extensive meetings and discussions with PHMSA, the exhaustive records reviews, and the comprehensive voluntary supplemental destructive testing conducted to prove the safety of the welds, after receipt of PHMSA's letter, on November 26, 2013, PHMSA's Washington and Regional representatives met with TransCanada to discuss the welding issues raised in the letter. At the meeting, TransCanada's subject matter experts and independent, third-party consultant confirmed that the welder qualifications and manual welding procedures performed on Spread 3 of the Project did, in fact, comply with all applicable requirements of 49 C.F.R. Part 195 and the standards incorporated by reference into the regulations. The conclusions reached at the meeting established that TransCanada had preemptively addressed any welding issues experienced at the very initial stages of construction of Spread 3 and had taken appropriate and additional steps to ensure the integrity of the welds.

With respect to both Warning Letters, PHMSA closed the files after receiving TransCanada's responses to them and, after TransCanada certified compliance with the Special Conditions, PHMSA authorized the Gulf Coast pipeline to be placed into service.

**6. Please explain the PHMSA oversight process on the Gulf Coast Pipeline Project?**

Answer: PHMSA's inspection of the Gulf Coast Project spanned three years, engaged 10 PHMSA inspectors (including a dedicated Project Manager), and entailed 165.9 days PHMSA personnel either spent in the field with the project or at off-site inspection locations. PHMSA oversight included:

- Design review meetings
- Field inspection audits on specific construction activities
- Construction records audits
- Fabrication facility audits
- Pipe mill audits.

Monthly management meetings were conducted to review construction status, Special Condition compliance, and quality findings and remediation arising from the Project's quality management program and PHMSA audit observations. The Project uploaded nearly 60,000 construction and compliance documents to a dedicated SharePoint site for PHMSA to review.

**7. Mr. Vokes suggests that a fatality occurred on the Gulf Coast Project caused by pipe falling off the skids. Is that accurate?**

Answer: No, it is not.

**8. Can you comment on Mr. Vokes' allegations of deficiencies related to the corrosion defect found on the Keystone System in 2012?**

Answer: Yes. Cathodic protection must be in operation not later than 1 year after the pipeline is constructed. The cathodic protection system on the Keystone pipeline was operational within six months of the pipeline's construction as required by Condition 36 of the PHMSA Special Conditions applicable to the base Keystone system. TransCanada began working with the operators of the nearby pipelines and adjustments were being made to the network of cathodic protection systems within the pipeline corridor to fine-tune the cathodic protection system and resolve the interference issue. The location of the small, isolated corrosion feature was subsequently identified during the baseline in-line inspection. The subsequent excavation and inspection determined the feature to be localized metal loss. The feature was repaired per criteria set forth in PHMSA Special Condition 48. This incident demonstrates our pipeline inspection systems worked as they were designed to do.

**9. Mr. Vokes alleges that TransCanada has experienced widespread problems with fusion bonded epoxy (FBE) pipeline coating, including systemic coating disbondment on its natural gas GTN pipeline. Are you able to comment?**

Answer: TransCanada has over thirty years of experience with FBE and uses FBE because it adheres well to the pipe and, even if it does disbond, it is easily detectable for repair and its disbondment does not interfere with the protection provided by the cathodic protection system. With specific reference to GTN, no systemic coating disbondment issues exist on the pipeline.

**10. Is the Keystone XL pipeline subject to column separation?**

Answer: All liquids pipelines, including water lines, are subject to column separation.

Column separation or slack line is a condition that occurs when the pressure in a pipeline drops below the vapor pressure of the liquid (essentially zero pressure) and a vapor space forms within the pipeline between liquid-filled spaces. Column separation can have detrimental effects on the pipeline and equipment and is therefore avoided during flowing operations.

TransCanada utilizes both automated control systems and control center operating procedures to prevent column separation. Pipeline pump stations and other facilities are equipped with automated control systems that monitor and control the pressure along the pipeline while operating at levels significantly above the vapor pressure of the oil in the pipeline, thereby preventing column separation while the pipeline is flowing. Additionally, pressures along the entire pipeline are continually monitored 24 hours a day, 7 days a week from the pipeline control center by trained Controllers. The Controllers are trained to recognize the pending onset of column separation and are also equipped with automated advisory systems that will alert them of pending column separation. The Controllers will then adjust operating pressure set-points accordingly to prevent the onset of column separation.

**11. Do you know the cause of the failure on the ExxonMobil Pegasus pipeline in Mayflower, Arkansas?**

Answer: PHMSA determined that the Pegasus pipeline failed due to manufacturing defects that were present in the pipe. The section of pipeline that failed was low-frequency ERW pipe manufactured by Youngstown in the late 1940's. This vintage of pipe is well-documented to be prone to manufacturing defects within the longitudinal ERW seam which can cause leaks and failures. The Pegasus pipeline did not fail because it was transporting heavy Canadian crude or a dilbit mix.

The manufacturing defects present on the Pegasus pipeline are a product of the pipe manufacturing processes that were used during that period in time. Modern steelmaking and pipe manufacturing processes prevent these defects from occurring on new pipelines.

**12. Can you comment on Mr. Vokes' allegations that armor plate is not an effective repair technique for repair of external corrosion?**

Answer: The use of composite reinforcement systems (i.e., armor plate) for pipelines has been extensively studied and they have been an accepted practice within the pipeline industry for decades and by PHMSA. Both ASME and ISO have established standards for the design and use of composite reinforcement on pipelines. The Armor Plate Pipe Wrap system that was used on Keystone has been tested more extensively than any other composite pipeline reinforcement system in the world. This system uses fiberglass to reinforce the pipeline, which is a material that has been used for structural applications since the 1930's.

Dated this 26 day of July, 2015.

  
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Dan King

**CERTIFICATE OF SERVICE**

I hereby certify that on the 27<sup>th</sup> day of July, 2015, I sent by United States first-class mail, postage prepaid, or e-mail transmission, a true and correct copy of the foregoing Surrebuttal

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