

Greg R. Perry
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September 11, 2019

Ms. Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
400 North Street
Harrisburg, PA 17120

RE: Comments on Docket Number L-2019-3010267, Advance Notice of Proposed Rulemaking Order (ANOPR)

Dear Secretary Chiavetta,

I am writing in response to the request for comments regarding the amendment and enhancement of Chapter 59 to more comprehensively regulate public utilities that transport petroleum product and other hazardous liquids, as found in the above-referenced ANOPR. In particular, I wish to address section II. B. 8. Corrosion Control and Cathodic Protection.

I have been engaged in the corrosion control industry for over thirty years, in particular in the design, installation and maintenance of cathodic protection (CP) systems, and in testing and interpreting test results. I am a long-time member of NACE International (formerly known as the National Association of Corrosion Engineers) and have held a certification of Cathodic Protection Specialist, the highest level certification specifically for CP, since 2005. I currently serve on several NACE technical committees dedicated to reviewing and approving industry standard practices.

The Corrosion Control and Cathodic Protection summary in the ANOPR contained a good review of the pertinent sections of 49 CFR 195 governing the criteria for protection and frequency of inspections of CP systems. I would, however, like to correct the NACE standard that is cited – NACE SP-0169-2007, which is actually entitled “Standard Practice, Control of External Corrosion on Underground or Submerged Metallic Piping Systems”. Moreover, I would like to point out that this version is not the latest edition – NACE SP-169 was revised in 2013, but the Pipeline and Hazardous Materials Safety Administration (PHMSA) has not yet issued a regulatory update adopting the latest edition.

Corrosion of metals is a complex process involving many factors, which can operate at a microscopic level on a transcontinental scale. 49 CFR 195 as promulgated, interpreted and enforced by PHMSA and designated representatives is also a complex and thorough regulation, requiring substantial effort and diligence of pipeline operators, product manufacturers, consulting engineers, construction contractors and inspectors. If there is anything that these disparate people share in common, it the strong desire to protect the safety of public first and foremost, the environment, and then asset protection.

While the desire to enhance and strengthen protective regulations of intrastate pipelines in Pennsylvania is admirable, I would strongly caution against any modifications to the dictates of 49 CFR 195. These regulations have been refined over many years. Improvements to the effectiveness of corrosion control measures, including cathodic protection, have come not so much from adjusting the

regulations, but from advances in our understanding of the corrosion process, where it can hide undetected, how we can better deliver cathodic protection to the places where it is needed, how to monitor whether we are successful, and how to do it without interfering with the efforts of other practitioners of CP. If the PUC were to make modifications to requirements ostensibly for greater protection, we take a non-insignificant risk of diverging from the state of the art of corrosion control and the protection of the public and the environment.

For these reasons, I would also very strongly urge against the adoption of certain suggestions made in comments entered into the record by the Pennsylvania Public Utility Commission, Bureau of Investigation and Enforcement, Safety Division. Among other comments, BI&E recommends adopting criteria for cathodic protection that appear to be paraphrasing of a small part of criteria contained in NACE SP0169-2007, namely one or more of the following:

- a) A negative (cathodic) potential of at least 850 mV with voltage drops removed from all current sources in the pipe to soil measurement. This potential is measured with respect to a saturated copper/copper sulfate reference electrode contacting the electrolyte.
- b) A negative polarized potential of at least 850 mV of at least 850 mV relative to a saturated copper/copper sulfate reference electrode.
- c) A minimum of 100 mV of cathodic polarization between the structure surface and a stable reference electrode contacting the electrolyte. The formation or decay of polarization to satisfy this criterion and the length of time with current sources off must be base [sic] off measured soil resistivities. The length of time should not be excessive to expose areas of the pipeline and other foreign pipelines to the detrimental effects of corrosion.

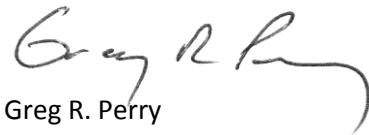
Both a) and c) above are substantially altered from the criteria found in the recognized industry standard, NACE SP0169-2007. But even if this small excerpt had been faithful to the original, it leaves out important special conditions and considerations that should be made. In the criteria included in NACE SP0169, conditions are listed that indicate that protection may be achieved at values less negative (such as encased in concrete or buried in dry or aerated high-resistivity soil) or situations where the listed criteria may not be adequate (e.g. in the presence of sulfides, bacteria, elevated temperatures or connected to dissimilar metals). The exact wording and content of the criteria for protection forms a fundamental issue of the application of cathodic protection. The NACE International standard is the consensus language of the entire industry, and should not be altered lightly. The suggested language might be easier to enforce, but it would not result in improved public safety. Moreover, the original section referenced in the BI&E suggestion was altered in the 2013 edition of NACE SP0169, when the language was altered to constitute a more rigorous practical interpretation.

Furthermore, any recommendation to decrease the mandatory interval of required testing to make them more stringent than required by PHMSA would not necessarily result in improved public safety. Mandatory interval testing, while helpful and necessary, can sometimes detract from efforts of pipeline personnel to improve their monitoring, identify deficiencies in their CP coverage, and make improvements or remedies to their systems. Repetitive surveys, such as measuring structure-to-electrolyte potentials at fixed test points, or even close interval potential surveys, are time-consuming sampling techniques. Greater benefit can be obtained when pipeline companies follow their own written integrity management plans. These plans are generally more comprehensive and are more likely to identify deficiencies than simple regular-interval testing.

I would strongly recommend that any regulations governing corrosion control and cathodic protection of petroleum product and other hazardous liquids make reference to applicable industry standards rather than providing specific language that could become obsolete as technical understanding and best management practices are improved. NACE International maintains standard practices and test methods that cover a multitude of corrosion topics, including cathodic protection, coatings, interference, inline inspection, interior corrosion and integrity management.

I appreciate the opportunity to comment of the regulations being developed by the PUC, and support your efforts to safeguard the public and the environment.

Yours truly,

A handwritten signature in black ink, appearing to read "Greg R. Perry", with a long, sweeping flourish extending to the right.

Greg R. Perry
NACE CP Specialist #4419