Association for Materials Protection & Performance

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

April 12, 2022

Dear Secretary Chiavetta,

It has come to the attention of AMPP (Association for Materials Protection and Performance) Advocacy and Public Affairs Committee that Pennsylvania has been in the process of developing new pipeline regulations. Our members within the Commonwealth have asked us to review the proposed rulemaking and weigh in on this issue. AMPP is a global community of professionals dedicated to materials protection through the advancement of corrosion control and protective coatings. Our mission is to protect infrastructure and assets worldwide.

While the initial docket filing by Pennsylvania Public Utility Commission (PA PUC) was May 31, 2019 (https://www.puc.pa.gov/docket/L-2019-3010267), there were over 100 Comments submitted before the comment period for the rulemaking ended on September 11, 2019. We were only just informed of the Notice of Proposed Rulemaking Order (NOPR) on February 12, 2022, after a long period of inactivity. While we have numerous concerns with the NOPR, one key issue stands out; the failure to continue the thread started on the original Docket Site and post the notice on another site that is not linked to the comments from 2019. The NOPR issued on February 12, 2022, starts the 60-day comment period yet interested parties in the Commonwealth are not aware of this recent posting at the site listed below.

http://pacodeandbulletin.gov/Display/pabull?file=/secure/pabulletin/data/vol52/52-7/233.html&search=1&searchunitkeywords=L-2019-3010267

AMPP is a newly merged organization combining the Society of Protective Coatings and NACE International. The association represents more than 36,000 members who work to help governments and industries prevent corrosion and materials-related failures. We accomplish this in many ways including global standardization. While we are pleased that PA PUC is considering the use of SP0169-2013, "Control of External Corrosion on Underground or Submerged Metallic Piping Systems,", it is a requirement that the standard be referenced and used in its entirety. If the PUC uses language from a published standard, that standard must be fully referenced. SP0169-2013 is referenced by the Department of Transportation's Pipeline and Hazardous Materials Safety Administration and thus there is no cost to use the standard. The PUC must incorporate the standard fully to ensure proper management and application. Additional concerns and issues are presented below.

We thank you in advance and look forward to your response.

Emer C. Flounders, Jr., P.E.
PureHM, Business Development Manager
Chair, AMPP Task Force
Advocacy and Public Affairs Program Committee
PA PUC Regulations

Greg R. Perry
Echidna Integrity LLC
Vice Chair, AMPP Task Force
Advocacy and Public Affairs Program Committee
PA PUC Regulations

§59.139 Pressure Testing

Proposed changes to §59.139 includes a requirement for assessment by in line inspection (ILI) tools. The federal standard 49 CFR 195 416, *Pipeline Assessments,* allows that, when use of an in-line inspection tool "is impracticable based on operational limits, including operating pressure, low flow, and pipeline length or availability of in-line inspection tool technology for the pipe diameter", that operators must use other acceptable methodologies of pipeline assessments. The requirement in §59.139 provides for no such exception when impracticable. (Interestingly enough, the ILI requirement has been placed in the middle of one of the alternate appropriate methods, pressure testing.) Notable in its absence is the option for pipeline operators to utilize another industry standard method of pipeline assessment under 49 CFR 195.416 – External Corrosion Direct Assessment (ECDA). Also, §59.139(b)(1) and (c) calls for an assessment using ILI tools but lacks sufficient detail to describe what constitutes a proper in-line inspection, whether the tool selection is appropriate, how an inspection should be conducted, and how the data should be maintained, analyzed and used.

AMPP, as the successor to NACE International, is the developer and maintainer of the industry standard that is incorporated by reference in 49 CFR 195. 591, *In-Line Inspection of Pipelines* – NACE SP0102, *In Line Inspection of Pipelines*. We believe that incorporating by reference the latest revision of this standard into §59.139 would be the best way to ensure that mandated in-line inspections are conducted appropriately and in accordance with best industry practices.

AMPP is also the developer and maintainer of the industry standard incorporated by reference in 49 CFR 195.588, *What standards apply to direct assessment?* – NACE SP0502, *Pipeline External Corrosion Direct Assessment Methodology*. We believe that either methodology, selected and applied by qualified practitioners, offers suitable and appropriate assessment of a pipeline. The option to utilize ECDA methodology under appropriate circumstances should be available as an alternative to pressure testing or in-line inspection.

§59.143 Corrosion Control

The proposed changes to §59.143 bring up several points that we would like to address.

(b) Procedures

"A hazardous liquid public utility shall determine and document the average and the worst-case corrosion rate experienced for each pipeline segment." - Without supporting established sound engineering practices, pipeline operators have no way to reasonably conform to this requirement.

(c) Criteria for cathodic protection

Proposed changes to §59.143(c) include three criteria to determine whether the level of cathodic protection over the entire pipeline is adequate. These criteria bear striking similarity to the criteria found in NACE SP0169-2007, *Control of External Corrosion on Underground or Submerged Metallic Piping Systems*, but they appear to be misquoted or deliberately rewritten. A revised version of NACE SP1069 with expanded clarification of the criteria was issued in 2013 and is the state of the art and best practices. Review and revision of the standard is ongoing.

AMPP, as the successor to NACE International, is the developer and maintainer of NACE SP0169. This Standard Practice is the culmination of decades of consensus standards development and revisions and is the modern consensus standard in the corrosion-control industry. Federal regulations, in 49 CFR 195.571, *What criteria must I use to determine the adequacy of cathodic protection?* cite NACE SP0169 as the sole determination of criteria for cathodic protection and incorporates the standard by reference. AMPP does not condone use of the criteria for cathodic protection that has been altered from the consensus standard. Criteria, as worded in the proposed rule, are not technically correct and do not conform to SP0169.

Specific problems with the proposed language in §59.143(c) includes:

(1) "A negative (cathodic) potential of at least 850mV 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." - SP0169, in a similar criterion at §6.2.1.3 (2013) or §6.2.2.1.1 (2007), provides explanations of how other voltage drops should be considered. Failing to properly consider voltage drops, and the magnitude that should be removed, could result in a potential reading that appears to meet this criterion but does not.

(2) "A negative polarized potential of at least 850mV relative to a saturated copper/copper sulfate reference electrode." - This language is similar to a criterion found in the 2007 and earlier versions of SP0169, but was judged to have been misapplied, and incorporated into the §6.2.1.3 criterion

of SP0169 in the detailed explanation of consideration. Without a definition of "negative polarized potential" and explanation of how it is measured or determined, this language is still subject to misinterpretation.

(3) "A minimum of 100mV 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 based upon measured soil resistivities. The length of time must not allow exposure of an area of the pipeline and other foreign pipelines to the detrimental effects of corrosion." -This bears a similarity to the criterion found in SP0169 at §6.2.1.2 (2013) or §6.2.2.1.3 (2007), although the discussion in this criterion regarding length of time is a complete innovation. While length of time that cathodic protection is turned off to allow a structure to depolarize is a matter of concern for corrosion control professionals, it does not contribute to or belong in a criterion for protection. This language is vague, offers no guidance on how length of time should be correlated to soil resistivity, and is unrealistic. Turning off cathodic protection for any length of time possibly exposes the structure "to the detrimental effects of corrosion", and thus the criterion prohibits the technique used to measure it. Without other important considerations, this criterion as written allows approval of cathodic protection that does not meet the requirements of SP0169.

As we just referenced, the section of criteria for protection found in any version of SP0169 includes important precautionary notes, special conditions, and other considerations for determining whether cathodic protection is adequate for protection. For this reason, more than any other, SP0169 includes the following language:

> For accurate and correct application, this standard must be used in its entirety. Using or citing only specific paragraphs or sections can lead to misinterpretation and misapplication of the practices contained in this standard.

Additional details found in the full standard include:

- Consideration of whether microbiologically influenced corrosion is present or probable. Where present, the listed criteria "may not be sufficient", and use of a negative polarized potential of -950mV or more, or as much as 300mV of polarization may be required.

- At elevated temperatures, the listed criteria "may not be sufficient", and more negative potentials may be required. The need for temperature correction of reference electrodes is not considered.

- On mill-scaled steel, cathodic polarization greater than 100mV may be required.

- The proposed criteria give no consideration to AC corrosion, which can occur on well-coated pipelines in close proximity to high voltage AC power lines, as may be found in a shared right-of-way. Under certain conditions, increasing the cathodic polarization can increase the AC corrosion.

- The proposed criteria give no consideration for other negative effects of increased cathodic polarization, including the possibility of hydrogen embrittlement and blistering and disbondment of coating.

- The proposed criteria give no consideration to electric shielding, which may occur when coating is disbonded or in other conditions. When electric shielding is not considered, measured levels of cathodic protection may appear to be adequate when they are not.

For all the reasons listed above, AMPP believes that any attempt in regulations to define criteria for the successful and effective application of cathodic protection should include all technical considerations, something that can only be achieved by citing NACE SP0169, latest revision, and incorporating it by reference. It is the opinion of AMPP that use of the proposed criteria for cathodic protection in §59.143(c) constitutes a *less stringent* standard than the federal regulations contained in 49 CFR 195.

(d) Adequacy of cathodic protection

(1) and (2) - Testing pipeline cathodic protection systems at regularly spaced test stations at one-year intervals is industry standard practice. The requirement to test a pipeline that is carrying Highly Volatile Liquids (HVL) twice a year is an unusual requirement and does not add to the safe operation of the pipeline. A properly tested and maintained cathodic protection system is not affected by the contents of the pipeline. There's no technical basis for HVLs having increased CP monitoring levels.

(3) Rectifier monitoring – Remote monitoring devices are an arguably superior method of monitoring rectifier condition than physical inspection. Remote monitoring provides real-time or more regular reports of rectifier potential failure or other abnormal conditions of concern. AMPP does not advocate a

requirement that all rectifiers should be required to have remote monitoring units, as monthly checks of rectifiers in remote areas and bimonthly checks in areas of regular activity have long proven to be effective. However, if an operator has determined that the benefit of remote monitoring units justify their cost, there is no need to require a physical inspection of each rectifier at least six times a year. While it might be prudent for an operator to physically inspect a rectifier at least once a year for maintenance, there is no need to mandate one at all as long as the remote monitoring device reports that the rectifier is operating within expected parameters, and the requirement does not contribute to public safety.

(e) Close Interval Surveys

Thank you for referencing NACE SP0207-2007, *Performing Close-Interval Potential Surveys and DC Surface Potential Gradient Surveys on Buried or Submerged Metallic Pipelines*. We do note, however, that the standard is being revised and a new version or affirmation may be issued soon, and we encourage the PUC to refer to the latest revision. We also note that, while performance of a close interval survey offers certain benefits in monitoring the application of cathodic protection, specifically those listed in SP0207 §1.5.2, the guidance for their use is found in SP0169, *Control of External Corrosion on Underground or Submerged Metallic Piping Systems* in §10.1.1.3, which says "When practicable and determined necessary by sound engineering practice, CIS may be conducted to…" There is no basis in sound engineering practice, nor is it practicable, to require close interval surveys at arbitrary time intervals.

Close interval surveys are a more intensive effort to determine levels of cathodic protection over the length of a pipeline. They are often used to augment the data measured at test stations at regular intervals along the pipeline, which should be performed at least annually, in accordance with SP0169 §10.3. After a close interval survey has been performed, annual test station measurements are highly indicative of the levels that can be expected if a close interval survey were to be performed again. For that reason, federal regulations only require close interval surveys to be performed after a new cathodic protection system is installed. See 49 CFR 195.573(a)(2), "Identify not more than 2 years after cathodic protection is installed, the circumstances in which a close-interval survey or comparable technology is practicable and necessary to accomplish the objectives of paragraph 10.1.1.3 of NACE SP 0169 (incorporated by reference, see § 195.3)." This requirement is usually interpreted to mean that close interval surveys are required after substantial changes to an existing cathodic protection system. For these reasons, the requirement of conducting a close interval survey every three years is not sound engineering practice and does not

contribute to public safety. A similar requirement linked to changes in cathodic protection systems would be more appropriate.

When regulations proscribe the use of close interval survey, the inclusion of paved surfaces as an unrestrained requirement offers substantial challenges and are not always justified as a sound engineering practice. In many cases, pipelines are contained in casings under paved surfaces such as large roads. Drilling holes and conducting a close interval survey across a road could cause significant interference with traffic while not providing any useful information. Furthermore, there is a reasonable expectation that paved surfaces reduce the penetration into the soil environment surrounding the pipeline of water and oxygen. As water and oxygen are deprived and not refreshed under a paved surface, the soil most often becomes less conducive to corrosion. Given the greater effort required and reduced expectation of finding a problem, testing under paved surfaces should not necessarily be included in every close interval survey being conducted, and a sample method at longer time intervals would be considered sound engineering practice.

Moreover, close interval surveys could be considered unnecessary or redundant in the face of other methods of monitoring corrosion control. One of these methods would be in line inspections. Reviewing in-line inspection tool survey data, in comparison with cathodic protection levels at test stations measured during annual survey, could be a better method of monitoring the effectiveness of cathodic protection.

Conclusion

This concludes our comments. AMPP appreciates the opportunity to comment on this important regulation, and we look forward to working with you in the future.