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**BEFORE THE ARIZONA CORPORATION**

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**COMMISSIONERS**

DOUG LITTLE –CHAIRMAN
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ANDY TOBIN

**IN THE MATTER OF THE PROPOSED AMENDMENTS OF THE PIPELINE SAFETY RULES A.A.C. R14-5-202, R14-5-203, R14-5-204, R14-5-205, AND R14-5-207.**

**DOCKET NO. RG-00000A-15-0098**

**NOTICE OF FILING SUPPLEMENTAL STAFF REPLY**

Staff hereby provides notice of filing the attached Supplemental Staff Responses to the March 28, 2016 written comments filed by Spectrum LNG in regards to the above captioned matter.

RESPECTFULLY SUBMITTED this 15th day of April, 2016.

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Original and thirteen (13) copies of the foregoing filed this 15th day of April, 2016, with:

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Arizona Corporation Commission
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# SUPPLEMENTAL STAFF REPORT
# SAFETY DIVISION, PIPELINE SAFETY SECTION
# ARIZONA CORPORATION COMMISSION

## PROPOSED RULEMAKING ON PIPELINE SAFETY RULES

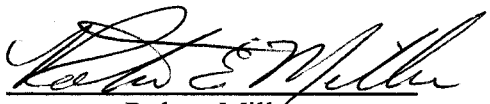
## DOCKET NO. RG-00000A-15-0098

## STAFF RESPONSE TO PROCEDURAL ORDER

**April 15, 2016**

## STAFF ACKNOWLEDGEMENT

The Additional Staff Report for Proposed Rulemaking on Pipeline Safety Rules, Docket No. RG-00000A-15-0098, was the responsibility of the Staff member listed below.



Robert Miller
Pipeline Safety Manager

Staff has received and reviewed the responsive comments filed by Spectrum LNG ("Spectrum") in this docket on March 28, 2016. Staff hereby provides its reply to Spectrum's comments. In order to provide a thorough response, Staff will set out the assertions it understands Spectrum to be making and respond to those, in turn, below.

**Spectrum's Introductory Comments**

As Staff understands the introductory comments to Spectrum's filings, Staff sees two assertions being made. The first is that processes are at work at the Federal level that would obviate the need to pursue rulemaking regarding LNG facilities, and specifically the proposed Rule R14-5-202(T).

In response to the first assertion, Staff would observe that the federal rulemaking process in this matter is at a germinal state and it can reasonably be anticipated that a rule change in this matter could be three to five years away. Staff would point out that Mr. Robert Miller was until recently the national chair of the National Association of Pipeline Safety Regulators and remains a voting board member and voted in support of the holding of workshops to develop federal rules concerning this issue. Moreover, in the development of its proposed rules, federal regulators are in fact reliant on the expertise of state regulators. As will be explained further in response to the Spectrum's comments regarding Staff's expertise in these matters, state regulators in the field of pipeline regulation (and Staff's in particular) typically enjoy greater expertise than federal regulators.

Notwithstanding the fact that federal regulators are considering the issue, Staff is unpersuaded that federal efforts lessen or eliminate the appropriateness of adopting Staff's proposed rule changes. The Commission is not foreclosed from adopting safety requirements that are not likewise adopted by federal regulators. As has been explained in Staff's January 26, 2016 filing, regarding Response (4), Staff provided a direct quotation from paragraph 3.1 of the Federal Certification and Grant Program guidelines. In pertinent part, the guidelines provide, "In addition, a state agency may issue additional or more stringent standards concerning intrastate pipelines as long as they are compatible with Federal regulations."

Staff submits that not only are the proposed changes not in conflict with the current federal regulations, Staff's proposed rule change is still permissible even if a less stringent federal regulation is adopted because a state agency is permitted to adopt more stringent requirements.

The second assertion is that Staff's proposed Rule R14-5-202(T) reflects a treatment of cryogenic facilities as inherently more dangerous than other pipe bearing natural gas. In response, Staff disagrees with the assertion.

The result of Staff's proposed rule change is to treat cryogenic facilities *equally* with respect to other high pressure pipelines that carry hazardous liquids or natural gas. Under existing Arizona rules, transmission pipeline is already required to perform 100 percent non-destructive testing on all new welds. *See* A.A.C. R14-5-202(S). Staff would note that some piping within Spectrum's facility is not 49 C.F.R. 193 (LNG) piping but is instead 49 C.F.R. 192 piping and operates at transmission pressures. Facilities specifically utilized in the cryogenic phase of the liquefying process are likewise subject to unique thermal stresses. Ensuring the integrity of welds used to connect facilities engaged in the cryogenic phases of the process is no less important than for transmission pipelines.

**Comment 1**

The only assertion made by Spectrum that has not been previously addressed by Staff is that Staff did not address the frequency of testing in relation to the permissible methods of non-destructive testing. Staff acknowledges that it did not address the frequency of testing. The question posed to Staff was what are permissible methods of non-destructive testing. Staff's response included attached copies of the standards and the standards speak for themselves with regard to the frequency required under the ASME and NFPA standards. Staff would note that the standards do not require 100 percent testing of transmission main welds. Nonetheless, Arizona

has seen fit to adopt a more stringent requirement than is required under the standards. *See* A.A.C. R14-5-202(S). The ASME and NFPA standards are not a ceiling on what constitutes an appropriate frequency for non-destructive testing.

**Comment 2**

Spectrum's Comment (2) contains multiple assertions. The first assertion is that Staff's illustrative example is speculative. In response, Staff agrees. The nature of examples is that their applicability is always speculative. However, the basis for Staff's pricing information was provided in terms of daily minimum charges and hourly rate charges as well as daily minimum charges and Staff's estimates of average welding time and testing time are reasonable approximates based on industry experience.

Spectrum additionally asserts that Staff's cost estimates did not account for lost production cost. Staff did not include lost production cost in its estimates. Because non-destructive testing must be completed prior to bringing facilities into service, a facility would not be permitted to initiate operations in any event. Consequently it is inappropriate to include lost production cost as an economic cost of the rule change. Further, if the lost production costs makes it more economically feasible to perform testing on a rolling basis in concert with construction rather than as a post-construction process, then that is not a cost of the rule but rather a facet of how an operator leverages testing costs against foregone revenues due to delayed in-service date.

Finally, Spectrum asserts that the rule change would impact 95 percent of all the welds on any new facilities Spectrum is constructing and the costs of implementation should be considered. In response, Staff has considered the costs as part of its economic impact statement. Staff acknowledged that adoption of the rule change would impart a cost on operators. However, these costs will vary depending on the circumstances and how an operator manages their welding projects.

Whether the cost renders any particular project economically infeasible is not the threshold for appropriateness of a rule, particularly a safety rule. *See* Staff's filing on January 26, 2016 in this docket, response (10), first paragraph. Further, as alluded to by Staff in response (2) of that same filing, what may be uneconomic for Spectrum may be economic for any number of other current or future LNG operators. For example, a provider of non-destructive testing services may locate closer to where an LNG facility is sited, thereby eliminating the full-day's flat charges and travel associated charges. Alternatively, an LNG facility may be constructed closer to a non-destructive test service provider. Southwest Gas Company's Tucson LNG storage facility (*see* Docket No. G-01551A-14-0024), for instance, would be covered by the proposed rule change and is located close to a major city where one of the testing service providers that Staff queried for purposes of developing its cost evaluation is located. Because of its proximity to the service provider, the costs will be lower for Southwest Gas's Tucson facility for instance.

**Comment 3**

Spectrum's Comment (3) asserts again that because federal regulators are in the early stages of scoping a potential rule change in this area that the Commission should not adopt the proposed rule. In response, Staff would refer to its previous response to Spectrum's introductory comments. Additionally, Staff would note that Spectrum's assertion that PHMSA and industry are the entities with the primary expertise concerning LNG safety regulation is erroneous. PHMSA works in partnership with NASPR with PHMSA recognizing that in matters of intrastate safety regulation, including LNG facilities, that States possess the leading source of expertise.

**Comment 4**

Spectrum's Comment (4) asserts that it has complied with the terms of the settlement approved by Decision No. 75301 (October 27, 2015), and that those terms produce a greater assurance of safety at lesser cost. In response, Staff acknowledges that Spectrum has complied

with the terms of the agreement. Staff would note that one of the terms of the settlement agreement required 100 percent non-destructive testing of the welds that were the subject of that matter. *See* Settlement Agreement attached to Decision No. 75301 at page 8, Terms and Conditions paragraph 1 "Testing of Welds for New Compressor".

Further, the settlement agreement only binds Staff and Spectrum whereas a rule change would make this a requirement throughout the state. As Staff already discussed in its January 26, 2016 filing at response (2), Spectrum is not the sole LNG facility operator in Arizona, nor is the industry limited to there being only two providers. For example, Southwest Gas Company is constructing an LNG storage facility in the Tucson area. Per the definition of LNG Facility provided by A.A.C. R14-5-201(12), that storage facility would meet the definition of an LNG facility that would be covered by the adoption of the proposed A.A.C. R14-5-202(T).

**Comment 5**

Spectrum makes the assertion that peak shaving LNG facilities are already regulated pursuant to 49 C.F.R. 193. In response, Staff reiterates that pursuant to the Federal Certification Program, the Commission is not bound to treat federal regulations as the ceiling on what is determined to be appropriate regulation by the states. As has already been alluded to and will be more fully explained below in response to (11), this is an area where federal regulators already defer to the greater expertise of state regulators.

Spectrum makes the additional assertion that Staff's example of the Nampo, Idaho incident from 2014 is inapplicable to Spectrum's facilities because the failed weld was a component that was subject to the testing requirements associated with pre-fabricated components. In response, Staff views the example as applicable because it demonstrates that improper welds on components that operate under the pressures and temperature variations present at an LNG facility can, and do fail. That the failed weld was performed under the tightly controlled circumstances of a factory setting reinforces Staff's view that it is appropriate to perform full examination of welds performed under field conditions where performance of a proper weld is more difficult.

Spectrum makes the final assertion that pursuant to CFR Part 193, that leaks and spills occurring at an LNG facility must be reported. As Staff stated in the original comment to which Spectrum responded with this assertion, the reporting requirements only came into effect in 2011. *See also* Spectrum's March 31, 2016 Comments, attached Exhibit 2 at page 3 (indicating adoption of 49 C.F.R. 193.2011 reporting requirements November 25, 2010). Likewise, the requirement only applies to LNG facilities regulated by PHMSA.

**Comment 6**

Spectrum asserts that there is no typical LNG facility and that it operates relatively little (approximately 300 feet) of piping that operates at low temperatures. In response, Staff would first observe that Spectrum's comment appears to be misunderstanding the thrust of Staff's safety concern (i.e. misunderstanding Staff to have a particular concern about "cold" pipe). As has already been addressed, this is a misunderstanding on Spectrum's part of Staff's concerns. Staff is concerned about the integrity of welds that are subject to high pressures and also welds that are subject to high pressures and cryogenic temperatures. As Staff already described the cryogenic liquefying process in its January 26, 2016 filing at response (10), the process exerts both pressure and thermal stresses on facilities within the LNG plant. There will be (1) facilities that are "warm" and under high pressure, (2) facilities that are "cold" and under high pressure and (3) facilities that are "cold" but under negligible pressure. As asserted in Spectrum's comments, and Staff has no reason to dispute, the purely "cold" facilities that are not under significant pressure are limited. However, as also noted in Spectrum's comment 8, there are facilities in Spectrum's LNG plant that will experience pressures as high as 1,000 psi as well.

The majority of the facilities involved in a natural gas liquefying process will be "warm" high pressure or "cold" high pressure. This is because, as explained in Staff's January filing in response (3), the process involves both increasing the pressure *as well as* decreasing the

temperature of natural gas in order to transition it from a gaseous state into a liquid state. To elaborate, natural gas is successively pressurized, then cooled, then repressurized and recooled as needed until it liquefies. Once it is in a liquid, it is typically no longer necessary to further pressurize it as a liquid is a denser state of matter than a vapor. This is the principle that makes liquefaction an economic undertaking – that is to say, by rendering natural gas into a liquid, greater quantities may be transported in smaller volumes making it amenable to storage or transport by containers rather than pipeline. In the liquid state, so long as LNG is kept sufficiently cold, it will remain in a liquid state and it is no longer practical or necessary to further pressurize it for transportation. Consequently, Staff does not dispute that very little of an LNG facility is "cold" at negligible pressure.

Spectrum's comment tends to reinforce Staff's concerns by illustrating that most of the facility's welds will be dedicated to handling phases of the liquefying process where the natural gas is under high pressure or is being cooled *and* being subjected to high pressure.

Finally, Spectrum's comment includes an additional assertion that "warm" high pressure pipe need not be tested at a 100 percent frequency because of the ASME standards. As noted in earlier Staff responses within this filing, the Commission has already adopted rules that are more stringent than the ASME requirements with respect to transmission pipelines. A.A.C. R14-5-202(S). Because the pressures involved in the cryogenic process are comparable to transmission pressures, Staff believes that the concern with testing the integrity of welds is at least equal to the concern presented by transmission pipelines. That there is an additional stress factor present with LNG facility welds owing to the high thermal stresses also being exerted on the welds that are both high pressure and "cold" enhances the appropriateness of extending the same requirement applied to transmission pipeline facilities to LNG facilities.

**Comment 7**

In Comment 7, Spectrum asserts that the testing requirements for transmission lines is condition based rather than a full 100 percent requirement. In response, Staff believes that Spectrum appears to be focusing on the federal requirements which only apply to interstate facilities. At an intrastate level, the requirement in Arizona is for full 100 percent non-destructive testing of all new welds for transmission facilities, regardless of conditions, pursuant to A.A.C. R14-5-202(S).

**Comment 8**

In Comment 8, Spectrum asserts that there is no single pipe that must withstand the full range of pressure or temperature changes necessary in the cryogenic liquefaction process. Staff agrees. As explained by Staff in earlier comments above and prior filings, as well as in Spectrum's comment 8, the process involves stages where pressure will be increased, maintained, and the natural gas transported under pressure to a further stage where it is cooled, and then transported to another stage where the natural gas is further pressurized, that pressure is maintained and the gas further cooled until the natural gas transitions to a liquid at which point it need merely be kept cold.

Spectrum additionally asserts that this rulemaking addresses only "warm" pipe welds. In response, Staff believes that Spectrum's assertion reflects the mistaken impression that the intent of the proposed rule change is to correct an ambiguity in the ASME guidelines (ASME 31.1 section 6.6.3.2 requiring 30 percent of all welds per day testing for pipe that operates above -20 degrees). Apparently, Spectrum is of the impression that Staff's proposed rule change is to repair or clarify the ASME. Spectrum is incorrect.

Staff has been unambiguous that the intent of the rule is to address Staff's safety concern that welds performed for the purpose of containing hazardous liquids at high pressure need to be tested to confirm the integrity of the weld. The pressures involved at either "warm" or "cold" temperatures are a comparable stress in either case. The "cold" quality of the cryogenic process supplies an additional mechanical stress, however. In light of the additional stress factor supplied

by the cold, it is inappropriate to treat LNG facilities as less worthy of inspection than transmission pipeline for which there is already a 100 percent testing requirement. As with the transmission weld requirement, Staff's recommended rule change would elevate the requirement to a more stringent one than is currently established by the ASME.

**Comment 9**

Not applicable.

**Comment 10**

Not applicable.

**Comment 11**

In Comment 11, Spectrum asserts that Staff possesses limited experience with LNG facilities because there are few such facilities in Arizona. Spectrum further asserts that PHMSA would not require such stringent testing of a facility like Spectrum's LNG operation. Spectrum concludes its assertions with a return to its comment that even though Arizona is typically at the forefront of new best safety practices in pipeline safety matters that because PHMSA is engaging in workshops to consider how to address LNG regulation and these processes involve multiple perspectives the Commission should refrain from proceeding with the proposed rule change.

In response, with respect to Staff's experience, the safety inquiry posed by the rule relates to whether a weld that must withstand specified stresses, such as operating pressures (up to 1,000 psi as indicated by Spectrum's comments) and can withstand those strains. The relevant experience called into question is welding skill, not gas or petroleum production operations. However, with respect to Staff's command of issues relating to welds that must withstand set stresses is guided by multiple qualified welders within Staff and a cumulative body of experience in the decades, if not centuries. Staff believes that it has sufficient expertise to understand the relevant issues relating to the quality of welds.

Moreover, Staff's experience is relied upon by federal regulators. In addition to the prior industry experience of the various Staff members, all Staff members in the Pipeline section are also federal safety inspectors and must receive continuous federally sponsored training. Staff's inspectors have, and currently are serving as PHMSA associate instructors for PHMSA's Training and Qualification Division which bears responsibility for training both state *and federal* inspectors. The extent of individual training maintained by Staff inspectors exceeds the average maintained by federal inspectors. Likewise, regarding Spectrum's preference that these issues be addressed in national fora such as NASPR, whose participation in PHMSA's LNG workshops was stressed by Spectrum's comments, Staff would note that NASPR was until recently chaired by Staff's Pipeline Section Manager. Staff believes that the record amply demonstrates that Staff is qualified to promote pipeline safety rule enhancements and that its views are heeded on the national stage as well.

Staff would again reiterate that states are not bound to treat the federal regulation as a ceiling on what constitutes an appropriate degree of regulation in pipeline matters. The product of the PHMSA process will address operations regulated by PHMSA and not intrastate operations which are regulated by those states that regulate pipeline matters. Therefore, Staff does not believe it is necessary or appropriate to defer adoption of Arizona rules pending the outcome of federal processes.