June 1, 2015

Docket Management System
U.S. Department of Transportation
Docket Operations, M-30, Room W12-140
1200 New Jersey Ave., SE,
East Building, Second Floor
Washington, DC 20590-0001

Re: Dr. Palermo Letter of Support for Docket No. PHMSA-2014-0098.

Greetings,

I am writing this letter in support of all the changes being proposed for plastic piping materials in Docket No PHMSA-2014-0098, the Notice of Proposed Rule Making (NPRM) known as the "Plastic Pipe Rule". As stated in the Background section, these changes are being proposed in the interest of pipeline safety. Whenever gas operators can use plastic pipe instead of metal pipe, safety, integrity and long-term performance of the pipeline are increased. My only criticism of PHMSA on this NPRM is that I wish it could have been issued sooner. Below are my specific comments on the key areas of the NPRM.

A. Traceability and Tracking

I am in support of the proposal for Part 192.63 to require operators to adopt the tracking and traceability requirements in ASTM F2897. ASTM members, in particular Hitesh Patadia and Alicia Farag, have developed a good ASTM standard and most manufacturers are adopting it. ISO has had tracking and traceability requirements for several years in their gas standards, and I am glad that we are now doing the same.

B. Design Factor for PE

Polyethylene (PE) pipe has been the material of choice in the United States for gas distribution applications for many years – since the 1960's. Several years ago, the Plastics Pipe Institute introduced new pipe material designation codes for the new higher performing PE materials, such as PE 2708 and PE 4710. These modern PE materials have very good resistance to slow crack growth (SCG), which is the primary field failure mode for PE pipe. As evidenced by the "7" in the pipe material designation code, these higher performing PE materials must meet a PENT (Pennsylvania Notch Test per ASTM F1473) value of 500 hours, which is the highest SCG cell class in the PE material standard ASTM D3350.

Several years ago, the American Gas Association (AGA) submitted a petition to PHMSA requesting to increase the design factor for these higher performing PE 2708 and PE

4710 materials used in gas distribution applications from 0.32 to 0.40. As part of their petition, AGA submitted the results of considerable research, testing and field studies that had been conducted on these higher performing PE materials:

> *"The petition provides documentation of the comprehensive program, supported by the Operation Technology Development (OTD) group, to establish the technical evidence for the proposed changes. The program has included laboratory testing and evaluation to ensure that the safety and integrity of the gas distribution system is maintained at the increased design factor. Field experiments, authorized by special permits from state and federal pipeline safety agencies, have been initiated to confirm design and laboratory evaluations. This effort has been active since at least 2004. The technical evaluation of the plastic pipeline design factor has been publicly discussed and supported in various regulatory initiatives through the AGA, Gas Piping Technology Committee (GPTC), Plastics Pipe Institute (PPI), Gas Technology Institute (GTI), and others entities.*
>
> *The public benefits from the increased use of PE piping, in lieu of steel, because the plastic piping systems have quantifiable lower emissions. Moreover, plastic is not susceptible to corrosion, which is responsible for some of the leakage in steel piping systems."*

The use of a 0.40 design factor is not new to the North American gas distribution market. Canada changed its design factor from 0.32 to 0.40 in its Z662 Code for Gas Distribution Systems in 1996. Gas distribution systems have been operating very safely in Canada with the use of the 0.40 design factor for almost twenty years now. In fact, Canada recently increased its design factor for gas distribution from 0.40 to 0.45 for these higher performing PE materials. With the new 0.45 design factor, PE 2708 and PE 4710 now have the same pressure rating as PE 80 and PE 100 materials, respectively.

HDPE pipe (PE 4710 material) used in gas distribution applications has a design pressure of 100 psig, based on Part 192.121 with the current design factor of 0.32, an HDB of 1600 psi and a DR of 11. Increasing the design factor to 0.40 would increase the design pressure to 125 psig. The primary reason for this increase in design factor is to raise the design pressure to a value that is consistent with the rest of the world. For example, most PE 4710 materials are also listed as PE 100 materials in PPI TR-4. As a PE 100 material, the design pressure using the ISO design equation for DR 11 pipe is 145 psig. The same PE material using the current 0.32 design factor can only be operated at 100 psig, which is 45% lower than the capability of the PE pipe using the ISO system. Even by increasing the design factor from 0.32 to 0.40, we are still being conservative when compared to international experience for PE 100 materials that were introduced in 1985 – thirty years ago. The new higher design pressure of 125 psig with the increased design factor of 0.40 is still 16% lower than the design pressure of 145 psig for the exact same PE material using the ISO pressure rating system.

Use of these higher performance materials with a higher design factor of 0.40 permits higher operating pressures for plastic pipe. In many cases, the gas companies can then use plastic pipe instead of metal pipe. Use of these higher performance plastic materials results in increased long-term performance of the piping system and a safer gas distribution piping system. Many of the failures experiences by gas companies with

metallic pipe systems have been due to corrosion failures. In this regard, plastic piping systems have an exceptional safety record and the AGA has reported that the failure rate for metal pipe is about ten times higher than for plastic pipe. By increasing the design factor for polyethylene gas distribution systems, gas distribution companies can extend this higher level of long-term safe performance over a broader distribution area. As a result, the public benefits from the use of safer, non-corroding plastic piping systems. By going to the 0.40 design factor, we provide a basis by which gas distribution companies can extend the use of plastic pipe systems and displace the lower safety related performance of metal pipe with the higher safety related performance of plastic piping systems.

C. Expanded Use of PA-11

I am in support of the proposed changes for PA-11. I introduced PA-11 as a new plastic piping material for gas applications in North America in 1995 when I was with Arkema. PA-11 has been successfully used internationally for gas applications for more that 40 years. More recently there have been several ASTM standards developed for PA-11 pipe and associated fittings, primarily through the work of Frank Volgstadt. I agree with increasing the pipe size to 6 inch and I agree with increasing the maximum operating pressure to 250 psig.

The only thing that I do not agree with is in the new Part 192.121(d)(2)(ii). You are proposing to limit the pipe material designation code to only PA32316. PPI TR-4 also lists PA32312 and it is certainly possible for PA32312 pipe to operate at 250 psig. I suggest you consider having both PA32312 and PA32316 in this section.

D. Incorporation of PA-12

I am in support of adding PA-12 to Part 192. PA-12 is very similar to PA-11 and both materials are being used very successfully for gas applications internationally. Recently there have been several ASTM standards developed for PA-12 pipe and associated fittings, primarily through the work of Richard Wolf. There have also been several successful trial installations using PA-12 by gas operators in the US.

E. Risers

Since I personally wrote the petition to PHMSA, on behalf of GPTC, to include use of above-ground plastic pipe in Part 192, I am in support of this proposal.

F. Fittings

Finally, PHMSA is proposing to restrict mechanical fittings used for gas applications in accordance with Part 192 to Category 1 fittings only. It only makes sense to do this. There is no reason for a gas operator to use anything but a Category 1 mechanical fitting. This proposal is consistent with a recent project that I chaired in Canada for revision to the CSA B137.4 standard, which is similar to our ASTM D2513. In this CSA standard, we now only allow Class 1 mechanical fittings (similar to Category 1 in the US). I also have a project to revise the Canadian Oil and Gas Code (similar to our Part 192) to only allow Class 1 mechanical fittings for gas distribution applications. Thus, I fully support this proposal by PHMSA.

G. Reorganization of Part 192.121 and Part 192.123

I like your idea of combining Parts 192.121 and 192.123 and making them specific to various plastic piping materials. I feel this is better organized and much clearer. Also, it will be easier to add new plastic piping materials in the future.

I only have one suggestion for change. The new Part 192.121(a) is generic for all plastic piping materials included in Part 192.121, which it should be. In this section, you have listed under the definition of "S" the HDB for plastic materials at various temperatures ranging from 73 to 140ºF. This is the way it used to be in the original Part 192.121 when it was for PE materials. This new generic Part 192.121 now includes both PA-11 in Part 192.121(d) and PA-12 in Part 192.121(e). Both of these materials have HDB ratings listed in PPI TR-4 at 180ºF. Therefore, you should include an HDB at 180ºF in the new Part 192.121(a) under the definition of "S" (HDB).

Thank you for giving me the opportunity to comment on Docket No PHMSA-2014-0098, the Notice of Proposed Rule Making (NPRM) known as the "Plastic Pipe Rule". I am in support of all the changes that are being proposed for plastic piping materials. Thank you also for considering the suggestions that I have provided for your consideration.

Sincerely,

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