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CERTIFIED MAIL – RETURN RECEIPT REQUESTED

March 16, 2017

Mr. Allan C. Beshore
Director, Central Region, OPS
U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration
901 Locust Street
Suite 462
Kansas City, MO 64106-2641

Re: Notice of Proposed Violation, Proposed Civil Penalty, and Proposed Compliance Order No. CPF 3-2016-5011 Response

Mr. Beshore:

On behalf of Flint Hills Resources Pine Bend, LLC (“FHR”), I am responding to the above-referenced Notice of Probable Violation, Proposed Civil Penalty and Proposed Compliance Order, No. CPF 3-2016-5011, issued December 15, 2016 (together, the “Notice”).

1) §195.132 Aboveground breakout tank.

As to the first alleged violation, FHR respectfully disagrees that it failed to adequately follow the requirements of API Standard 650 (“API650”) for construction of breakout tank number 541 (“Tank 541” or the “Tank”). In fact, FHR worked diligently with its contractor, Landmark Tank Services (“Landmark”) and other parties to ensure API650 was met. Additionally, an FHR construction inspector was on sight during construction.

Tank History:

Tank 541 was constructed in 2013 by Landmark Tank Services, and includes an internal floating roof installed by HMT Tank, Inc. The Tank was designed and constructed to the API Standard 650, 11th Edition.

For background, Tank 541 consists of five shell courses. The bottom (first) course consists of 0.50” thick steel. The second course consists of 0.375” thick steel. The top three courses (three, four, and five) consist of 0.25” thick steel.

The plates in the first two shell courses were shaped (rolled) prior to installation to match the diameter of the tank. The plates in the top three shell courses were not rolled. Per section 6.1.3 and figure 6-1 of API650, on an 85-foot diameter tank, shaping of the 0.25" thick shell plates prior to installation is not required.

During construction, FHR required testing for conformity with API650. A sweep board inspection found that three of the shell plates (one in the third course, and two in the fourth course) had non-conforming local deviations, including peaking and banding beyond the allowable tolerance of API650, §7.5.4, which provides dimensional tolerances to produce a tank of acceptable appearance and to permit proper functioning of floating roofs. Sweep board tests are "go/no-go" tests, with no documentation requirements established in API650.

In addition, an inspection performed by Hagen Engineering International, Inc. ("HEI") identified those same areas of non-conformance with API650 (see *Tank Verticality Report*, attached as *Exhibit 1*). HEI inspected the tank for conformance with API650, §7.5.2 - 7.5.4 (Plumbness, Roundness, Local Deviations). Please note that the Tank Verticality Report ("HEI Report") was inadvertently not made available to PHMSA prior to now, and we believe it demonstrates that the entire tank was evaluated for compliance with the dimensional tolerances established in API650.

In the HEI Report, HEI noted that three criteria are to be considered when analyzing local deviations and plumbness of a tank: aesthetic quality, operational ability, and structural integrity. The HEI Report found that despite the peaking and banding noted by the sweep board inspection, "[s]tructurally, the tank would be sound. Aesthetically, these areas cause the tank to not be very pleasing, and...[t]ank 541 verticality measurements did not show any areas which would have been of great concern for floating roof operation." The HEI Report concluded by reiterating, "The issues found in the verticality survey if not repaired, will not affect the tank structurally or operationally, but, aesthetically, it will leave a lasting reminder of the quality of product that was installed."

Given the Tank was to be constructed according to API650, FHR had Landmark correct the non-conforming local deviations by removing and replacing the three shell plates. *Exhibit 2* contains a photograph taken during the replacement of a plate in the fourth shell course. After the three shell plates were replaced, they were inspected for peaking and banding using sweep boards and were found to be within the tolerances of API650.

Once construction of the Tank was complete, a hydrotest was successfully performed. A third party licensed professional engineer, acting as an authorized representative of Landmark, and the same HEI representative that previously inspected the tank, completed his review of the construction documentation, reviewed repair photographs, and issued an API650 Certification Letter (see *Exhibit 3*). This letter certifies that the tank was constructed to API650, including the dimensional tolerances established in API650, §7.5. Based on the Certification Letter, Landmark issued and installed an API650 nameplate on the Tank, thereby also certifying the tank met API650 requirements. Based on these certifications, FHR accepted the Tank as meeting the requirements of API650 and initiated filling the Tank on February 21, 2014.

Approximately six months after being placed into service, FHR personnel observed new shell deformations. However, based on the successful hydrotest, the API650 certification of the tank, the HEI Report, and engineering judgment, FHR had confidence in the structural integrity of the tank.

However, to confirm that the new localized deformities would not impact the functionality of the internal floating roof (“IFR”), FHR contracted TÜV SÜD PetroChem Inspection Services (“PetroChem”) to complete laser scan examinations of the external surface area of the tank (the “Laser Scans”) in June of 2014. This was done to ensure none of the deformations were large enough to compromise the IFR’s ability to travel unimpeded and effectively seal against the tank shell. In order to identify areas of interest, PetroChem used dimensional tolerances stated in API Standard 653 (“API653”), §10.5.3. Although the API653 §10 tolerances are not directly applicable to Tank 541 as it is not a reconstructed tank, they were used to identify areas of potential concern. The analysis concluded that there were no areas on Tank 541 that exceeded the tolerances of the IFR. This report is included as *Exhibit 4*.

PHMSA Field Audit:

On October 8, 2014, PHMSA conducted an inspection of FHR’s Milwaukee terminal. The appearance of the shell of Tank 541 caused concern for the inspector.

To address these concerns, FHR initiated the following additional evaluations:

- December 2014. Tank Industry Consultants completed an API Recommended Practice 579 (“API579”) fitness for service assessment of the Tank. API579 (referenced in API653) provides for quantitative engineering evaluations of the structural integrity of in-service tanks. The standardized fitness for service assessment procedures presented in API579 provide technically sound approaches that ensure the safety of plant personnel and the public. It provides industry with consensus methods for reliable assessment of the structural integrity of equipment containing identified flaws or damage. Part 8 of API579, “Assessment of weld misalignment and shell distortions,” is the applicable section for this situation. This assessment utilized the data obtained during the PetroChem Laser Scans, and concluded that the shell deformations are not structurally significant. This report is included as *Exhibit 5*.

In the Notice, it is stated that FHR should have examined Tank 541 to support an assumption that “there are no crack-like flaws in the welds or no locally thin areas, blisters, grooves or cracks in the deformed areas in the parent metal adjacent to the welds.” This is a standard engineering assumption, held to be true except when there are indications to the contrary. In the case of Tank 541, this is a good engineering assumption in that welding and associated radiography were performed in accordance with API650, and no crack-like flaws were found in any of the radiography. Additionally, a successful hydrostatic test was completed. Hydrostatic testing results in a more rigorous test of the welds than in-service loading, given the greater fluid density of water applying more force on the welds. Finally, Tank 541 has operated for approximately three years without indication of weld issues. All things considered, there is no indication of flaws contrary to this assumption. FHR has adequately examined the Tank, and believes that no further inspections are warranted.

- January 2015. At the request of the PHMSA inspector, FHR quantified the areas that exceeded API650 construction tolerances for local deviation. FHR contracted with Petrochem to perform this quantification and to review and opine upon the data obtained from the Laser Scans. FHR initiated this work knowing that API650 tolerances were no longer applicable, given Tank 541 had been placed into service nearly a year prior. This analysis is included as *Exhibit 6*.
- March 2017. As a result of receiving this Notice, FHR followed up with the professional engineer who certified the Tank. In a letter from Doug Bayles, professional engineer with Hagen Engineering International, Inc, he discusses his methods and again provides confirmation that Tank 541 met API650 after the shell plates were replaced (see *Exhibit 7*).

FHR believes the use of flat stock on the upper three shell courses contributed to the deformations and acknowledges that the visual appearance of the Tank lends itself to the questions and concerns about the local deviations. However, FHR believes that the information provided demonstrates that the Tank met API650 requirements prior to hydrotesting and placement into service and that the Tank is structurally sound.

Applicability of API650:

The Notice says that “During PHMSA’s inspection, peaking and banding was observed that exceeded the API650 maximums.” FHR does not disagree with that statement. However, FHR does disagree with PHMSA’s application of API650 to an in-service tank. At the time of the PHMSA inspection, Tank 541 had been in service for several months. API650 was no longer applicable because API650 peaking and banding tolerances only apply *prior* to hydrotesting the tank. API650, §1.1.2, clearly states that the “Standard is intended to help Purchasers and Manufacturers in ordering, fabricating, and erecting tanks...” API650 does not speak to inspecting tanks once in-service.

As hydrotesting and filling the tank place stress on the tank, different API standards – API653, API Standard 579, etc. – are used to determine whether the tank is structurally sound and fit for service once filled. API653 §4.3.5.2 states, “Shell distortions can be caused by many conditions such as foundation settlement, over- or under- pressuring, high wind, poor shell fabrication, or repair techniques, and so forth.” API653 §4.3.5.3 states, “Shell distortions shall be evaluated on an individual basis to determine if specific conditions are considered acceptable for continuing tank service and/or the extent of corrective action.”

API650, §7.5.1 advises, “The purpose of the tolerances given in §7.5.2 through §7.5.7 is to produce a tank of acceptable appearance and to permit proper functioning of floating roofs. Measurements shall be taken prior to the hydrostatic water test.” API650 is clear that these tolerances only apply prior to hydrotesting a tank. It also establishes the purpose of the dimensional tolerances, which is to ensure the IFR is properly functioning. FHR’s IFR is properly functioning. Therefore, the standard has been met.

In addition, API has published other materials further explaining that API650 applies prior to a tank going into service. In its *Technical Inquiries for API Standard 650, Welded Tanks for Oil Storage*,¹ API provides the following:

Inquiry No. 650-I-40/00: For tanks built to API 650 and complying with Section 5.5 dimensional tolerances and subsequently commissioned, do the minimum requirements of API 650 with respect to plumbness, banding, etc., still apply after a tank has been placed in service?

Response: No. API 650 covers the design and construction of new tanks. Any tolerance rules that might apply after the tank has been placed in service, typically API 653 plus any supplemental owner requirements, are to be determined by the local jurisdiction and the tank owner. See API 653, 1.1.1, Section 8, and 10.5.2, for further information and for some examples.

Inquiry No. 650-I-12/01: Question 1: Does API-650 require that tolerances (plumbness/peaking bending/roundness) be checked after the construction of each shell course, rather than after the completion of the entire shell?

Response: These tolerances must be measured by the purchaser's inspector at anytime prior to the water test. See Sections 4.2.3, 5.3.1.2, and 5.5.6.

Question 2: If repairs are required to meet the specified tolerances, when must the repairs be made?

Response: API 650 does not address the timing of these repairs.

Inquiry No. 650-I-03/03: Question 1: Do the requirements of API 650 Section 5.5 apply to tanks that have been completed but not hydrostatically tested?

Response: Section 5.5.6 requires the dimensional tolerances in 5.5 be taken prior to the hydrostatic test; unless they are waived by the purchaser; see 5.5.1.

Question 2: Do the requirements of 5.5 apply to tanks that have been completed and hydrostatically tested?

Response: No. See 5.5.6.

Question 3: During the floatation test required in C.4 and H.6, can the tank be rejected due to out of roundness or plumbness?

Response: No. See 5.5.6.

Certification of Compliance with API650:

FHR objects to PHMSA's dismissal of the P.E. inspection and certification of Tank 541 as API650-compliant.

¹ Technical Inquiries from API website at www.api.org. Inquiries were with respect to API 650 10th Edition, November 1998.

API650, §1.3.1 states, “the Manufacturer is responsible for complying with all provisions of this Standard. Inspection by the Purchaser’s inspector does not negate the Manufacturer’s obligation to provide quality control and inspection necessary to ensure such compliance.”

The API650 standard provides that the “Manufacturer shall certify to the Purchaser, by a letter...that the tank has been constructed in accordance with the applicable requirements of this Standard.” The certification letter provided by Mr. Doug Bayles, P.E., is precisely what is required under the API650 standard. Mr. Bayles has more than 20 years of experience, is licensed in 48 states and Canada, and is an active participant in API committee work.

Similarly, the Manufacturer is to provide a Manufacturer’s Nameplate showing that the tank meets the requirements of API650. Landmark did issue such a name plate for Tank 541.

FHR does not understand why PHMSA is not satisfied by the certification letter and the Manufacturer’s Nameplate, which meet the requirements of API650.

Expecting FHR to meet the API650 standard after the tank has been hydrostatically tested and placed in service is not reasonable and is an undue burden. We believe no additional benefit can be found by performing the inspections requested in the Proposed Compliance Order.

For all these reasons, FHR is confident that Tank 541 met the dimensional tolerances of API650 before being hydrotested, and is confident Tank 541 is fit for service today. Thus, as to Probable Violation 1, FHR again respectfully contests the finding, requests elimination of the Proposed Civil Penalty, and objects to the Proposed Compliance Plan.

2) **§195.264 Impoundment, protection against entry, normal/emergency venting or pressure/vacuum relief for aboveground breakout tanks.**

With respect to Probable Violation 2, PHMSA alleges that Tank 541 fails to comply with the drainage system requirements of NFPA 30. We respectfully disagree.

The Notice does not include important facts or address “seriousness”:

PHMSA’s Notice alleges that Tank 541 fails to comply with NFPA 30 § 22.11.1 and §22.11.2, because “the drainage route was not located so that if the liquid in the drainage system where ignited, tanks and piping would not be exposed to fire.”

There are two preliminary issues with this statement. First, the Notice does not specify what tanks or piping could be “exposed to fire” or whether NFPA 30 §22.11.1 or §22.11.2 (or both) are being applied to these tanks and piping. Without these facts, FHR has made certain assumptions about what parts of its facility are at issue.

To the extent that PHMSA is referring to the proximity of Tank 540 to the drainage trough that runs east from Tank 541 along the north side of the facility to an impoundment area, we have assumed that PHMSA is applying NFPA 30 §22.11.1.3, which follows the language in PHMSA’s Notice.

Second, NFPA 30 §22.11.1.3 is very clear that potential exposure to fire alone is not enough, it must be *serious* exposure:

NFPA 30 §22.11.1.3. The drainage route shall be located so that, if the liquid in the drainage system is ignited, the fire will not seriously expose tanks or adjoining property.

The Notice does not acknowledge this seriousness requirement. Nor does it state how the drainage trough could seriously expose tanks or piping.

The drainage trough would not seriously expose any tank to fire:

The drainage trough for Tank 541 causes fluids to flow away from the Tank, to the outer edge of the containment area, to a remote impoundment pond (see *Exhibit 8*). FHR reviewed this containment design and concluded that a fire in the drainage trough would not seriously expose Tank 540 or any other tank or equipment in or near the drainage path to a fire in the trough or remote impoundment pond.

This determination was made because the walls of Tank 540 and other storage tanks near the drainage path are steel and would need to be heated to at least 1000°F for ten minutes to lose strength.² Moreover, the liquid inside the tank forms a large heat sink that would absorb and limit the rate at which the tank walls heat up, increasing the time of exposure before the steel walls lose strength.³ Given these conditions, it would take a significant amount of time to heat the tank to 1000°F, and then it would have to remain at that temperature for at least ten minutes.

This is especially important because the area available for flow in the drainage trough, combined with the grade of the trough (which meets or exceeds 1%), ensures the flow of liquids from any tank draining into the trough would pass all storage tanks in under ten minutes, even if there was a catastrophic failure of a tank. Stated differently, if flowing liquids were on fire in the trough, the fire would not last long enough to weaken the walls of any tank in the drainage path. Serious exposure would not occur. This is also true for non-catastrophic releases. The smaller release volumes would not generate a fire significant enough to endanger the tanks or equipment.

For these reasons, FHR respectfully requests that PHMSA remove references to Tank 541's impoundment routes from the Proposed Compliance Order. In the alternative, we request additional information regarding the basis for a violation based on NFPA §22.11.1.3, as discussed above. If the violation is not based on this provision, please notify FHR of the applicable provision and provide additional time for a response to this new information.

Probable Violation 2 and the Proposed Compliance Order also address the drainage slope around Tank 541. FHR will ensure the slope around Tank 541 complies with NFPA 30, and will submit documentation of work done, as stated in the Proposed Compliance Order.

² See NFPA Fire Protection Handbook, Section 6, Chapter 2 (supporting the position that steel tank walls must be heated to 1000°F for ten minutes to lose strength).

³ Based on wetted surface heat transfer calculations.

3) Proposed Compliance Order - Documentation of safety improvement costs.

FHR proposes tabling this matter pending resolution of the matters addressed elsewhere in this response.

Although FHR is not requesting a formal hearing, we would appreciate the opportunity to discuss our response with you informally. FHR values its positive, cooperative relationship with PHMSA and looks for a mutual understanding of these important matters. You may contact me directly at (316) 828-8520 (or by email at keith.walton@fhr.com) to schedule a time to visit in Kansas City. Otherwise, I will contact you to schedule a meeting time.

Thank you for your consideration and we look forward to meeting and closing this matter.

Respectfully yours,



Keith Walton
Compliance Manager
Terminal Operations