United States Environmental Protection Agency

Underground Storage Tank Technical Compendium

U.S. EPA Office of Underground Storage Tanks

The compendium contains interpretations and guidance letters sent out by the Office of Underground Storage Tanks.

Contents

Applicability, Definitions, and Notification (ADN)

Question 1: Do the Part 280 requirements apply to process waste traps (oil-water separators) located at various Schlumberger manufacturing and metal finishing facilities?
[December 2, 1988 letter from Hunt and Hunt Engineering to Region VI]

Answer: In general, oil water separator systems are either excluded or deferred from the regulations under one of the following provisions: as field constructed tanks and/or as waste water treatment tank systems subject (or not subject) to section 402 and 307(b) of the Clean Water Act.
[Undated letter to Mr. Hunt]

Question 2: Who is responsible for UST tanks that are owned by one party, rented to a second party who in turn subleases them to a third party?
[February 2, 1989 letter from Elmer Street]

Answer: All three parties could be subject to enforcement action should noncompliance be discovered.
[Undated letter to Mr. Street]

Question 3: What does the term "deferred" mean in the context of Part IV-Analysis of Today's Rule (Paragraph A.3) in the September 23, 1988 Federal Register and does the deferral apply to fuel oil storage tanks for emergency generators at hospitals, commercial and industrial facilities?
[May 9, 1989 letter from R. G. MacDiarmid of Goetting & Associates]

Answer: EPA is temporarily deferring Subpart D requirements for all emergency generator tanks regardless of location to allow time to develop workable release detection requirements for these tank systems.
[September 8, 1989 letter to Mr. MacDiarmid]

Question 4: Is a recast concrete vaulted tank system housing a tank below grade exempt from Part 280 requirements?
[July 5, 1989 request from Virginia via Region III]

Answer: Yes, "if the tank sits upon or above the surface of the floor and there is sufficient space to enable physical inspection of the tank bottom." (53 FR 37121)
[July 25, 1989 memorandum to Mr. Naylor]

Question 5: Are mixtures of gasoline and methanol, e.g., M85, to be treated as motor fuel or hazardous substances under 40 CFR Part 280?
[July 14, 1989 request from Jim Wisuri of the Steel Tank Institute via Richard Wilson Office of Mobile Sources]

Answer: M85 must be stored in a hazardous substance UST system because it contains 85 percent of a CERCLA-listed substance. Gasohols containing lesser amounts of methanol (generally, 2.5 to 5 percent) may be stored in petroleum UST systems. M85 can be stored in petroleum UST systems if a variance can be obtained, where allowed, by the implementing agency in accordance with the rule's requirements.
[December 3, 1989 letter to Mr. Wisuri]

Question 6: Are a monastery's two 500-gallon underground storage tanks subject to UST regulations?
[September 19, 1989 letter from Senator Howell Heflin]

Answer: No, as long as they store motor fuel that is non commercially used only by the monastery's residents. The monastery is considered a residence and, therefore, the regulatory exclusion for farm and residential USTs of 1,100 gallons or less storing motor fuel used for noncommercial purposes applies.
[October 6, 1989 letter to Senator Heflin]

Question 7: Are owners of USTs primarily responsible for ensuring compliance with certain section of Part 280 (e.g., 280.21, 280.22, and 280.34)
[December 27, 1989 letter from Alan Campbell of Dow, Lohnes & Albertson]

Answer: The regulations do not provide that the owner will be held "primarily" responsible for complying with these requirements. Some provisions impose requirements on owners exclusively and some on both owners and operators. A careful reading is necessary to determine whether only one or both parties may be liable in the event of noncompliance.
[January 19, 1990 letter to Mr. Campbell]

Question 8: Is the language in the UST rule's preamble about the underground areas exclusion intended to imply that tanks in vaults are no different than aboveground tanks and regulated as such?
[January 30, 1990 letter from Frances Phillips of Gardere & Wayne]

Answer: The preamble's reference was simply meant to contrast vaulted systems as basically free from the problems that attend USTs and cause them to leak. Typical aboveground tanks are not in an enclosed space that is completely contained by a concrete barrier. The application of aboveground tank standards to vaulted tank systems may not be technically appropriate.
[March 20, 1990 letter to Ms. Phillips]

Question 9: Are USTs storing 3 products (alkylate H-2304, Aristol 360, and Aristol 400) comprised of a mixture of the C14-C30 alkyl derivatives of benzene regulated under 40 CFR Part 280?;
[March 26, 1990 request from the Ohio State Fire Marshal via Region V]

Answer: They are not regulated because they are not a listed hazardous substance, benzene is only present in de minimis quantities, and they do not belong in one of the general categories of petroleum

(and are not derived from crude oil).
[April 19, 1990 memorandum to Mr. Phillips]

Question 10: [1990 referrals from several EPA regions] Does my tank qualify for the heating oil tank exemption?

Answer: A decision tree (with notes) was provided to all the regions.
[Decision Tree]

Question 11: Can a form that utilizes slightly modified wording be used as a substitute for Appendix III to the rules?
[May 29, 1990 letter from Ed Nieshoff of the Fiberglass Petroleum Tank and Pipe Institute]

Answer: Yes, the recommended form can be modified (as provided by Mr. Nieshoff) for use by the tank seller to inform the tank purchaser of their notification responsibilities under the rules.
[July 11, 1990 letter to Mr. Nieshoff]

Question 12: Why are municipalities not exempt from UST regulations?
[September 25, 1990 letter from David England of Stewartstown, Borough, Pennsylvania]

Answer: The Federal statute (Resource Conservation and Recovery Act as amended, section 9001(1)(A)) exempts farm and residential USTs storing less than 1,100 gallons of motor fuel for "noncommercial" purposes. This exemption does not extend to small USTs owned by municipalities and there is no technical basis to broaden in regulation the law's specific exemption.
[November, 1990 letter to Mr. England]

Question 13: Are compartmentalized USTs considered one tank for purposes of regulation?
[May 14, 1991 letter from the National Association of Texaco Wholesalers, Inc.]

Answer: Compartmentalized tanks, and piping connected to it, are considered one tank system by EPA because they are manufactured, transported, installed, protected from corrosion, and often equipped with leak detection as a single unit. Please check with your State or local agency as they may interpret this question differently.
[August 12, 1991 letter to Mr. West]

Question 14: Is a 550 gallon UST storing gasoline at a nursery and landscaping business exempt from Part 280 regulations?
[May 16, 1991 letter from Congressman Jontz]

Answer: Generally, the "farm tank" exclusion applies to USTs located at nurseries where products for retail stores, garden centers, or landscaping businesses are grown and the fuel is used for agricultural purposes only.
[Undated letter to Congressman Jontz]

Question 15: Do the Part 280 requirements apply to the York Iceball Thermal Storage System consisting of a process whereby a 25 percent ethylene glycol 75 percent water solution is circulated between the ice ball storage tanks and chillers for the purpose of air conditioning a building during daylight hours?
[August 5, 1991 letter from York International]

Answer: No, the exclusion found at 280.10(b)(3) for "operational tanks" exempts this process from the regulations. The Thermal Storage System is similar to hydraulic lift tanks and electrical equipment tanks which are also included within this exclusion.
[Undated letter to Ms. Thomas]

Question 16: When are vaulted tank systems excluded from UST regulations?
[August 21, 1991 letter from William Nowman of Halissco, Inc.]

Answer: Tanks that are not supported by backfill, can be visually checked for evidence of leaks, and are built and installed to aboveground tank codes are not subject to EPA's UST regulations. In the example given, a vaulted tank system wherein the tank is within six inches of the vault on three sides and set back far enough on the fourth side for entry and inspection is not subject to the agency's UST regulations if the access provided on the fourth side is sufficient to observe evidence of a leak from anywhere on the tank vessel.
[August 26, 1991 letter to Mr. Nowman]

Question 17: Are crude oil production gathering lines exempt from jurisdiction under the UST program?

Answer: Yes, these gathering lines are exempt from jurisdiction under the UST technical regulations. (For more details on gathering lines, see page 37121 of the regulation's preamble, "Liquid Traps or Gathering Lines Related to Oil or Gas Production and Gathering Operations.")
[There is no additional material included for this answer]

Question 18: Are Subtitle C tanks exempt from the UST regulations? Are Subtitle I tanks on a Subtitle C site exempt from the UST regulations?

Answer: Subtitle C tanks are regulated under Subtitle C; the statute excludes their coverage under Subtitle I. Subtitle I will apply to tanks storing regulated substances, including corrective action on a subtitle C site without a RCRA permit. UST corrective actions underway at facilities having interim status under RCRA may be subject to review under Subtitle C during the development of the final permit

(see final rule preamble, page 37176).
[There is no additional material included for this answer]

Question 19: A new tank system was installed which violated the interim prohibition standards since the piping was not cathodically protected. The owner of this tank system sold the tank. Who is responsible for the interim prohibition violation, the previous owner or the new owner?

Answer: Either can be held responsible by the implementing agency. the original owner was in violation of the interim prohibition regulations and was responsible for protecting the piping. An enforceable violation remains at the site, even under new ownership. the implementing agency can pursue immediate compliance from the present owner or the past owner (if the past owner can be found).
[There is no additional material included for this answer]

Question 20: Does the emergency spill or overflow containment exemption of 40 CFR 280.10(b)(6) apply to sumps used to contain diesel fuel discharges from electric power generation turbines?
[August 28, 1991 letter from James Hamula]

Answer: The sumps are not used for an emergency spill, leak, or other unplanned occurrence. The sumps are designed to collect diesel fuel from an electric power generation turbine immediately after a false start. While these false starts are periodic, they are not emergencies. Therefore, the false start sumps described in your letter are subject to the 40 CFR Part 280 requirements.
[October 7, 1991 letter to Mr. Hamula]

Question 21: What substances are regulated as hazardous substances for USTs?

Answer: Please see the CERCLA hazardous substance list.
[CERCLA hazardous substance list] Exit

Question 22: Do tanks at a livestock exchange where livestock are sold on a commission basis and are not raised or bred qualify for the farm-tank exclusion?
[July 16, 1992 letter from Jean Riley of the Montana Petroleum Tank Release Compensation Board]

Answer: No, although the preamble to the regulation does not deal specifically with livestock exchanges, it clearly excludes from the definition of farm tank retail stores and nursery centers where agricultural products are "marketed, but not produced." A similar situation exists with livestock exchanges where livestock is solely marketed, but not raised. Thus, the mere fact that a tank is somehow associated with agricultural operations does not, by itself, allow the tank to be defined as a "farm" tank for purposes of the farm-tank exclusion under Subtitle I of RCRA.
[November 19, 1992 letter to Ms. Riley]

Question 23: A company stores diesel fuel in an underground tank. The diesel fuel is burned as a substitute for heating oil in an on-site furnace. The definition of underground storage tank (UST) in 40 CFR 2801.2(b) excludes any tank used for storing heating oil for consumptive use on the premises where stored. Does the underground tank storing diesel fuel meet this exclusion?

Answer: An underground tank storing diesel fuel will meet this exclusion if the diesel fuel will be substituted for heating oil; i.e., burned in a unit designed to use heating oil. the exclusion to the definition of UST in subsection 280.12(b) as No. 1, No. 2, No. 4-light, No. 4-heavy, No. 5-light, No. 5-heavy, and No. 6 technical grades of fuel oil; residual fuel oils (including navy Special Fuel Oil and Bunker C) and fuel substitutes such as kerosene and diesel fuel when used for heating purposes (53 FR 37117; September 23, 1988). A tank storing diesel fuel that will be burned as an alternative to one of these eight types of heating oil in a unit designed to burn heating oil is excluded from the definition of UST. If on the other hand, the diesel fuel is being used for some other purpose, such as to power an internal combustion engine or an emergency generator, the tank would not meet this exclusion. The question of whether tanks associated with emergency power generators are excluded from the UST definition under the heating oil exclusion is somewhat complex. A discussion on page 37118 of the September 23, 1988 Federal Register specifically addresses such tanks. The language indicated that the use of heating oil itself is not limited to heating, but may include other on-site uses, such as emergency generators. This discussion does not incorporate or address the stipulation that USTs containing fuels other than heating oil are only exempt if the fuel is burned as a substitute for heating oil in units designed for heating oil. Therefore, the language on page 37117 should be consulted for tanks containing other fuels such as diesel fuel.

The second part of the exemption involves the meaning of consumptive use. The exclusion applies to heating oil used at the same site where it is stored, but not to heating oil that is stored prior to resale, marketing or distribution. Consumptive use of heating oil is not limited to burning in a heater, but instead is defined as an on-site use (53 FR 37117). Therefore, the subsection 280.12(b) exclusion from the definition os UST applies to (1) tanks storing one of the eight technical grades of fuel oil prior to any on-site use, and (2) tanks storing fuel oil substitutes prior to use for on-site heating purposes only.
[There is no additional material included for this answer]

Question 24: Section 301 of the Clean Air Act Amendments of 1990 modifies the Clean Air Act (CAA) of 1986 by incorporating within subsection 112 a list of 189 hazardous air pollutants. Many of these pollutants were not previously regulated under the CAA. Would an underground storage tank (UST) containing a newly designated CAA hazardous air pollutant be subject to the standards promulgated in 40 CFR Part 280?

Answer: Yes. Owners and operators of USTs containing regulated substances, as defined in subsection 280.12, must comply with the Part 280 standards. A regulated substance is any hazardous substance designated pursuant to subsection 101(14) of CERCLA (excluding any substance regulated as a hazardous waste under Subtitle C of RCRA), and petroleum products or any fraction thereof. The term hazardous substance under subsection 101(14) of CERCLA is defined as any substance designated

pursuant to subsection 3001 of RCRA, subsection 112 of the CAA, subsections 307(a) and 311(b)(2)(A) of the Federal Water Pollution Act, subsection 7 of the Toxic Substances Control Act, and any substance so designated in subsection 102 of CERCLA. When a substance is added under statute identified in CERCLA subsection 101(14) it would then become a CERCLA hazardous substance by statutory definition and therefore become a regulated substance under Part 280. Note that any of the new substances or chemical categories added to the CAA that are CERCLA hazardous substances (e.g., ethylene glycol) or petroleum products are subject to regulation under Part 280 and this would not change.
[There is no additional material included for this answer]

Question 25: In a manufacturing operation a coating which contains regulated substances is applied to metal part that is manufactured on-site. The metal part is coated using the following steps. After machining processes are completed, individual metal parts are clipped to the bottom of a chain which is attached at its top to an overhead conveyor system. The conveyor carries the metal part to an open-topped tank containing a coating solution. The tank meets the definition of "underground" provided in 40 CFR 280.12. Once over the tank, the conveyor system lowers the metal part into the coating solution. The metal part remains submerged in the solution as the conveyor travels the length of the tank, then the conveyor system raises the metal part out the tank. The metal part is then transported via the conveyor to any area where a facility employee unclips the part and places it on a drying pad. Would this tank be exempt from the UST regulations of 40 CFR Part 280, under the "flow through process tank" exclusion of 40 CFR 280.12?

Answer: Yes, the tank would qualify for the exclusion because it meets the three necessary conditions to be considered a "flow-through process tank": it (1) forms an integral part of a production process; (2) has a steady, variable, recurring, or intermittent flow of materials through the tank during the operation of the process; and (3) is not used for the storage of materials prior to their introduction into the production process or for the storage of finished products or byproducts from the production process. These conditions are met because the production process (coating) actually occurs in the tank and therefore it is integral, and it does not store prior to or after production. The flow is intermittent, satisfying the second condition.
[There is no additional material included for this answer]

Question 26: Are USTs storing pure toluene considered to be "petroleum" or "hazardous substance" UST systems, and are owners and operators of such tanks required to maintain proof of financial responsibility?
[May 27, 1993 letter from Robert C. Galbraith, General Counsel to the Iowa UST Fund Board]

Answer: Toluene is a hazardous substance as defined under section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Therefore, for regulatory purposes under Subtitle I, an UST storing pure toluene is considered to be a "hazardous substance UST system," as defined in Part 280.12 of the UST regulations. Although EPA has the statutory authority to require financial responsibility for hazardous substance USTs, such as those containing toluene, EPA does not currently require owners and operators of hazardous substance USTs to maintain financial responsibility for taking corrective action or compensating third parties for releases from those USTs. [June 4, 1993 letter to Mr. Galbraith]

Question 27: Our office requests the term "annual" be defined for tank tightness testing, which is used in combination with monthly inventory control by many USTs to meet the release detection requirements. [Initiated by January 8, 1993 letter from Walter Huff, Mississippi DEQ]

Answer: "Annual," as used in 280.41(a)(2) and 280.44(b) for tank and line tightness tests, means on or before the same date of the following year. Similarly, "every 5 years," as used in 280.41(a)(1), means on or before the same date five years later. States may have imposed more stringent requirements than EPA's, and regulators may take into consideration efforts taken by owners an operators to meet the requirements.
[March 7, 1993 memorandum to UST/LUST Regional Program Managers]

Question 28: For an UST properly lined prior to December 22, 1988, when does the time period begin for the initial 10 year-year and subsequent 5-year inspections of the lining? More specifically, must the lining be inspected within 10 years from the date the UST was properly lined or within 10 years of the effective date of the regulations?
[May, 1994 inquiry from Virginia through Region III]

Answer: For an owner/operator to comply with 40 CFR 280.21's lining requirements, the lining must be inspected (and found to be performing in accordance with original design specifications) within 10 years of properly lining the UST (i.e., on or before the same date ten years later) followed by subsequent 5 year inspections.
[March 9, 1995 memorandum to Ms. Tan]

Question 29: Request for clarification on the qualifications for "corrosion expert" and "cathodic protection tester."
[February 2, 1994 letter from Kevin Garrity of NACE International]

Answer: OUST revised this answer on March 31, 2011 to reflect revised NACE International certifications. Two NACE International certifications meet EPA's regulatory definition of corrosion expert. These certifications are: "Corrosion Specialist" and "Cathodic Protection Specialist."

EPA's regulatory definition for cathodic protection tester does not require any specific certification; however, it does require education and experience in various corrosion areas. The following NACE International certification levels meet EPA's definition of cathodic protection tester: "Cathodic Protection Technologist"; "Cathodic Protection Technician"; "Cathodic Protection Tester"; "Senior Corrosion Technologist"; "Corrosion Technologist"; and "Corrosion Technician". In addition, persons meeting EPA's definition of corrosion expert would also meet EPA's definition of cathodic protection tester.

Please note that NACE International requires persons holding a NACE certification of "Corrosion Technician" to be appropriately supervised when serving as a cathodic protection tester.
[March 31, 2011 memorandum to state and federal UST/LUST Programs]
SUPERSEDED - [April 16, 2001 memorandum to state and federal UST/LUST Programs]
SUPERSEDED - [September 27, 1994 memorandum to state and federal UST/LUST Programs]

Question 30: How does Subtitle I of RCRA apply to certain water covered tanks containing carbon disulfide?
[Question from Region 4]

Answer: These tanks are not regulated because they are not underground and do not meet the definition of an underground storage tank.
[February 24, 1997 memorandum to Mr. Mason]

Question 31: What is the definition of "every 3 years" as it applies to cathodic protection testing at 280.31(b)(1)?
[Question from Ms. Dorcee Lauen]

Answer: The term "every 3 years" as it relates to 280.31(b)(1) means that a cathodic protection test must be conducted on or before the same day of the third year after the previous cathodic protection test has occurred.
[September 20, 1999 letter to Ms. Dorcee Lauen]

Question 32: Are UST systems containing E85 (approximately 85 percent ethanol and 15 percent gasoline) regulated under 40 CFR Part 280?

Answer: Yes. UST systems storing E85 contain more than a de minimis concentration of regulated substances and are regulated under 40 CFR part 280.
[November 27, 2007 Memorandum to State and Federal UST Programs]

Question 33: Are UST systems containing diesel exhaust fluid (DEF) regulated under 40 CFR Part 280?

Answer: No. UST systems storing DEF contain less than a de minimis concentration of regulated substances and are not regulated under 40 CFR Part 280.
[September 22, 2009 Memorandum to State and Federal UST Programs]

Question 34: How can UST owners and operators who wish to store ethanol blends greater than 10 percent or biodiesel blends greater than 20 percent demonstrate compliance with the federal compatibility requirement?

Answer: EPA published June 2011 guidance in the Federal Register for UST owners and operators who wish to store biofuel blends. EPA developed this guidance to help owners and operators comply with federal regulations in 40 CFR §280.32 that require UST systems be compatible with the substances they store.

Question 35: What are some examples of locations that are and are not considered residential for the purposes of "residential tank" under the definition of underground storage tank in 40 CFR part 280?

Answer: 40 CFR part 280 defines residential tanks as tanks located on properties used primarily for dwelling purposes. Based on this definition, EPA considers residential tanks to include those at homes, apartments, nursing homes and assisted living facilities. EPA would not consider tanks on properties such as prisons, hotels and camps to be residential tanks. Note that the residential tank exclusion only applies to tanks of 1,100 gallons or less in capacity that are used to store motor fuel for noncommercial purposes. [There is no additional material included for this answer.]

New/Upgraded UST Systems (NUS)

Question 1: Does the Total Containment Tank meet final performance standards for USTs (40 CFR 280.20)?
[Communications with OUST staff by Mike Nolan of Total Containment, Inc.]

Answer: Yes, based on Underwriters Laboratories (UL) test results and OUST's examination of the detailed specifications provided by Total Containment, Inc., OUST considers the system to meet the final performance standards for new tanks as provided for in section 280.20(a)(5).
[April 6, 1989 letter to Mr. Nolan]

Question 2: Is the Enviroflex piping system no less protective of human health and the environment than the other piping methods allowed under section 280.20 (b)(1)-(3)

Answer: Yes, but we may need to consider this determination should Total Containment fail to get UL listing in a timely manner, does not pass independent lab tests, or experiences operational problems with the integrity of the piping system that are detected through continuous monitoring of the prototype systems.
[August 1, 1990 letter to Region VII]
[September 4, 1990 letter from Region VII to Mr. Bowey]

Question 3: If a tank was installed during the interim prohibition, with galvanized piping installed with cathodic protection, but there were no "corrosion experts" on the staff of the installers, would the tank system still meet the requirements to do tank tightness testing every five year rather than the annual testing?

Answer: Yes, if the cathodic protection is being monitored and meets the criteria for cathodic protection. This should be sufficient for purposes of systems protected prior to December 22, 1988. The tank system must also have spill and overfill controls to qualify for the five year tank testing plan. Also, the piping must be monitored for releases like any other piping.
[There is no additional material included for this answer]

Question 4: An owner/operator has an STI-P3 tank with fiberglass piping and a steel pump. As currently designed, the pump is in contact with the backfill. Because of this contact, does the pump have to be cathodically protected?

Answer: This owner/operator has three options: (1) isolate the pump from the backfill; (2) cathodically protect the pump; or (3) get a "corrosion expert" to certify that, given the individual circumstances, cathodic protection is not needed. The corrosion expert would document this certification in a letter sent to the owner/operator, who would then keep copy in the office files.
[There is no additional material included for this answer]

Question 5: The technical regulations require owners/operators to check their cathodic protection within six months after a tank is installed, then every three years thereafter. For tanks already installed as of December 22, 1988, do owners/operators have to check the cathodic protection within six months after the regulations become effective, or does he/she have three years to make the first inspection?

Answer: For tanks already installed, owners/operators must begin adhering to the three-year inspection requirements. They would have to conduct an inspection within three years after the final rule's effective date--December 22, 1991--to qualify as a "protected UST system."
[There is no additional material included for this answer]

Question 6: Do the national codes or the final rule deal with the size of the overfill catch basin--are there specific requirements for minimum volumes?

Answer: No limits are established by national codes or in the final regulations concerning the size of the catch basins that must be used. Because these basins are for small spill containment, they should be able to contain volumes of at least one to two gallons. The standard size on the market is five gallons.
[There is no additional material included for this answer]

Question 7: Can owners/operators test their own cathodic protection systems using the Steel Tank Institute's "PP4" cathodic protection testing apparatus?
[May 6, 1993 letter to Region V from Ms. Beth Lockwood of Minnesota]

Answer: Yes, owners/operators can test their cathodic protection systems using the "PP4" tank testing apparatus and meet 40 CFR 280.31(b). This is because the PP4 test system was developed by corrosion experts, and the user can simply and easily verify that the cathodic protection system is operating properly without extensive knowledge about the dynamics of corrosion or corrosion protection.
[October 27, 1993 letter to Mr. Phillips of Region V]

Question 8: In 1992, the Steel Tank Institute (STI) requested that EPA relax the frequency requirements for ongoing cathodic protection monitoring, required under 40 CFR 280.31(b)(1), of "sti-P3" USTs from within 6 months of installation and at least every 3 years thereafter to at the time of installation and subsequently only after any disturbance of the tank excavation.

Answer: After careful review, the Agency has decided not to take any action at this time to relax the frequency requirements for cathodic protection monitoring of sti-P3 tanks.
[June 8, 1994 memorandum to John Barnes of STI]
[Notice of Data Availability - attachment to June 8, 1994 memorandum]
[Summary of Comments and EPA Responses - attachment to June 8, 1994 memorandum]

Question 9: What are the monitoring/inspection requirements when using the combination of internal lining and cathodic protection (CP) as a corrosion upgrade option?

Answer: There are three scenarios that might occur when using this corrosion upgrade option. They are:

1. Applying internal lining and CP at the same time.

2. Applying CP to an UST with an internal lining.

3. Applying an internal lining to an UST with CP.

For all options, the CP system needs to be monitored in accordance with 40 CFR Part 280.31. Periodic inspections of the lined tank are not required if the integrity of the UST was ensured prior to the addition of CP. Because integrity assessment is part of the industry lining codes, this will be the case in scenarios 1 and 3, but not necessarily 2. For example, if CP is added to an UST that was lined 5 years ago, but the integrity of the UST was not ensured prior to adding the CP, then periodic inspections of the lined tank are required.
[December 4, 1995 memorandum to State and Regional Program Managers]

Question 10: What is EPA's guidance regarding the assessment of the integrity of older bare steel USTs before the application of cathodic protection, under 280.21(b)(2)(iv)? In particular, what did EPA advise regarding ASTM Emergency Standard ES 40 (valid Nov.15, 1994-Nov.15, 1996)?

Answer: In guidance dated May 18, 1995 and Sept. 14, 1995, EPA recommended that implementing agencies find that the combination of ES 40 and certain monthly leak detection monitoring constitutes a method that prevents releases in a manner that is no less protective than that specified in the regulations at 280.21(b)(2)(i-iii). In guidance dated Oct. 21, 1996, EPA recognized that ES 40 would expire, and recommended that implementing agencies continue to follow their current policies until further guidance was issued, and that they not change to a policy relying only on leak detection for integrity assessment.
[May 18, 1995 memorandum to State and Regional Program Managers]
[September 14, 1995 memorandum to State and Regional Program Managers]
[October 21, 1996 memorandum to State and Regional Program Managers]

Question 11: Under what circumstances does EPA recommend the use of alternative (to human entry) integrity assessment methods prior to UST upgrading?

Answer: This regards the assessment of a bare steel UST's integrity before upgrading with cathodic protection. EPA recommends that implementing agencies continue their current policies (consistent with the Oct. 21, 1996 guidance noted in NUS **Question** 15) until March 22, 1998. EPA further recommends that agencies determine that an assessment performed after March 22, 1998 is no less protective that traditional, human-entry integrity assessment only if it meets one of two options. The first option is accordance with a national standard code of practice. The second option is evaluated by a qualified, independent third party demonstrating that the procedure meets certain performance criteria.
[July 25, 1997 memorandum to State and Regional Program Managers]

[October 9, 1998 memorandum to State and Regional Program Managers]
[Requirements checklist for former ES 40 and current G 158 standards]
[Compliance options for tank leak detection and integrity assessment - attachment to 10/9/98 memo]
[Flyer -- "Owners upgrading USTs: Make Sure Your Integrity Assessment Has Integrity" - attachment to 10/9/98 memo]

Question 12: Where may the ACT-100-U tank technology fit into the Federal regulations and will EPA recommend this technology?

Answer: This tank technology may fit into the regulations at 280.20 (a)(5) which allows implementing agencies to determine that a tank's construction and corrosion protection are no less protective of human health and the environment than other technologies already listed in the regulations. EPA recommends that implementing agencies determine that the ACT-100-U tank technology is designed to prevent the release or threatened release of any stored regulated substance in a manner that is no less protective of human health and the environment than those tanks already specifically listed in the regulations.
[June 25, 1998 memorandum to State and Regional Program Managers]

Question 13: Do double-walled USTs, with both walls being made of steel, require corrosion protection? If so, for those tanks that have cathodic protection, do they need to be monitored according to 280.31?

Answer: Corrosion protection is required for all USTs, including double-walled steel USTs. Cathodic protection monitoring is required for all tanks that have cathodic protection. However, for cathodically protected double-walled steel tanks that use interstitial monitoring capable of detecting a wall breach or ingress of product and water, EPA recommends that implementing agencies use the flexibility allowed in the regulations and require the cathodic protection monitoring time frame be within six months of installation and following any activity that could affect the cathodic protection system.
[August 5, 1998 memorandum to State and Regional Program Managers]

Question 14: Do ACT-100 and, where accepted by implementing agencies (see NUS Question 12), ACT-100-U tank technologies with anodes attached for supplemental corrosion protection have to be periodically monitored according to 280.31?

Answer: EPA does not believe that periodic cathodic protection monitoring is required for these tanks because they meet new tank standards without the addition of anodes. Therefore, EPA recommends that implementing agencies determine the following:

Periodic monitoring of cathodic protection systems is not required in the following cases:

1. When factory installed anodes are included with a new ACT-100 or ACT-100-U installation.

2. When field installed anodes are included with a new ACT-100 or ACT-100-U installation.

Note: In cases where cathodic protection is retrofitted to a previously installed ACT-100 or ACT-100-U tank, cathodic protection monitoring is required because the status of the cladding cannot be determined. This memorandum supersedes the information contained in a previous regulatory interpretation regarding CP monitoring requirements for clad steel tanks dated July 18, 1991.
[February 23, 1999 memorandum to State and Regional Program Managers]

Question 15: What is EPA's guidance regarding the new recommended practice for inspecting internally-lined tanks by Ken Wilcox Associates, Inc. (KWA)?

Answer: After careful review of the KWA recommended practice, comparison to existing lining inspection standards, and review of the federal regulations, EPA believes that the KWA recommended practice meets the requirements necessary for conducting inspections of internally-lined tanks as required in the federal regulations at 40 CFR 280.21(b). In addition, EPA recommends that states review the recommended practice to determine if it meets their lining inspection requirements, if applicable under state law. EPA recognizes that states may decide not to allow use of the KWA recommended practice for the periodic inspection of internally-lined tanks under state law.
[November 8, 1999 Memorandum to State and Regional Program managers]
[Attachment 1 - KWA Recommended Practice (PDF) (20 pp, 426 K) Exit]
[Attachment 2 - Comparison]

Release Detection (RD)

Question 1: Please clarify EPA's UST regulations as they apply to a threshold value for declaring an UST or its piping to be leaking using a tightness test.
[November 11, 1988 letter from Jack Horner of Horner Creative Products, Inc.]

Answer: To be able to detect a 0.1 gallon per hour (gph) leak as required in the regulations at a statistically reliable level of confidence, the threshold must be smaller than 0.1 gph. The correct threshold depends on the particular leak detection system and UST system, but is traditionally and typically 0.05 gph.
[December 19, 1988 letter to Mr. Horner]

Question 2: Is annual line testing required if a pressurized line is equipped with a permanent line monitoring device?
[June 1989 letter from Judith Spray of Pollulert Systems]

Answer: If an automatic line monitoring device meets the regulatory standard for a line tightness test, 0.1 gallon per hour at 1.5 times operating pressure, then it can be substituted for an annual line tightness test. Note that here are also ways to comply that do not involve line tightness testing.
[June 29, 1989 letter to Ms. Spray]

Question 3: How do you convert a leak rate at one operating pressure to an equivalent leak rate at another pressure?
[February 1990 letter from Michael Bouton of Tracer Research Corporation]

Answer: The appropriate formula for the conversion is that the leak rate is proportional to the square root of the pressure drop ratio.
[February 28, 1990 letter to Mr. Bouton]

Question 4: Do pressurized lines at UST sites that have monitoring wells around tank pits, but not along piping runs, also have to have an annual line pressure test?
[June 29, 1990 letter from Bill Birdwell of Tanknology Corporation International]

Answer: Pressurized lines must have automatic catastrophic leak detection backed-up by a monthly monitoring or annual line tightness test. If a tank excavation is intercepted by observation wells, but a pressurized line system extends beyond the designed reach of those monitoring wells, then an annual line tightness test or monthly monitoring is required.
[July 19, 1990 letter to Mr. Birdwell]

Question 5: Can statistical inventory reconciliation (SIR) be used to comply with EPA's UST regulations, including requirements for UST-associated piping?
[April 10, 1991 letter from Deborah Talanian of Entropy Limited]

Answer: SIR is generally a "tank system" test. Thus, if properly performed for any particular site, a SIR method that demonstrated adequate performance under the EPA evaluation protocols may be an acceptable alternative to periodic line tightness testing. The line still must have a catastrophic line leak detector, however.
[May 10, 1991 letter to Ms. Talanian]

Question 6: For purposes of EPA leak detection requirements what constitutes the portion of the tank that "routinely contains product"?
[June 1991 request from Region VIII]

Answer: EPA has determined it is protective of human health and the environment to be somewhat flexible about what portion of the upper part of the tank must be tested so that UST owners and operators can take full advantage of the different types of leak detection available. The "routinely contains product" language is intended to make clear that test methods do not have to test vent pipes, fill pipes, and fittings on top of the tank. Some simple rules of thumb about how far below these parts of the tank can be tested: (1) acoustic methods and SIR methods should not be a concern, as to the level tested; (2) ATG level-sensing methods should only be tested down the level at which the method was third-party evaluated; (3) major in-tank level monitoring service providers most often specify 85 to 95 percent full as their own protocol for testing and this is seen as meeting the routinely contains product provision; and (4) small business tanks with low product sales may test well below the top of the tank, if inventory data demonstrates restricted tank in filling practices that result in routinely low levels in the tank.
[July 25, 1991 memorandum to Region VIII]
[June 26, 1991 Attachment]

Question 7: Can manual tank gauging be used as the sole method of leak detection for tanks larger than 550 gallons?
[January 22, 1990 from Priscilla Young of the American Petroleum Institute]

Answer: When conducted in accordance with the procedures described in the attachment, manual tank gauging meets the performance specifications under 40 CFR 280.43(h)(1) for tanks of nominal capacity of 1000 gallons or less and, therefore, can be used as the sole means of leak detection.
[April 6, 1990 letter to Ms. Young]

Question 8: Do the performance capabilities of "catastrophic" automatic line leak detectors have to be tested in the field on an annual basis?
[August 12, 1991 memo from Region VII]

Answer: As requirements for automatic line leak detectors (LLDs), LLDs must be tested annually in accordance with manufacturer's requirements but not necessarily tested to any particular leak rate. The standard of 3 gallons per hour at 10 pounds per square inch within 1 hour is not the standard for the annual test but rather for the initial performance evaluation.
[March 5, 1992 memorandum to Regional Program Managers]

Question 9: Do systems incorporating flexible liners (bladders) and vacuum monitor systems meet the technical requirements?
[March 19, 1992 letter from John Hendershot of World Enviro Systems]

Answer: Flexible internally-fitted liner systems can be shown to meet the Federal requirements for release detection for both petroleum and hazardous substance USTs if certain conditions are met, including compatibility and automatic detection of a breach in either the outer tank or the inner liner. These systems cannot meet Federal requirements for upgrading or repairing existing UST systems.
[July 9, 1992 letter to Mr. Hendershot]

Question 10: Please clarify whether the Federal underground storage tank regulations at 40 CFR 280.43 require inventory control with automatic tank gauges (ATGs).
[October 2, 1992 letter from Mr. Durgin of Veeder Root to David Ziegele]

Answer: Inventory control is not required, regardless of the installation date, if the ATG has been shown to meet the performance standard and the probabilities of detection and of false alarm.
[November 22, 1993 to Mr. Culp]
[April 18, 1989 Attachment]

Question 11: If a facility is using statistical inventory reconciliation (SIR) monthly and a report is not conclusive, is the owner/operator out of compliance?

Answer: Yes, an UST system relying on monthly SIR with a report that does not conclusively indicate whether the system is leaking at 0.2 gallons per hour with a probability of detection of 0.95 and a probability of false alarm of 0.05 is not technically compliance with the release detection requirements. A lack of conclusive results may not be possible on a small percentage of tank data each month, for several reasons. Because of this, EPA encourages States and Regions to use discretion, and to consider the efforts of owners and operators to comply in assessing whether or not enforcement is carried out.
[November 18, 1993 memorandum to State and Regional Program Managers]
[February 7, 1994 letter to Mr. Hunt]

Question 12: Request that EPA require siphon bars that join manifolded tank systems to be regulated with respect to leak detection and corrosion protection, and that inventory control not be an acceptable means of leak detection for a manifolded system.

[May 23, 1994 letter from Dale Tanke of the Office of the Illinois State Fire Marshal to Gerald Phillips, US EPA Region V.]

Answer: Siphon bars are already regulated in terms of leak detection and cathodic protection requirements as part of connected underground piping that routinely contains product. Due to the manner in which the syphons routinely operate, however, leak detection requirements are minimal, akin to that of safe suction lines.

As to leak detection with manifolded tanks, inventory control with periodic tightness testing is permissible until December 22, 1998 or until ten years subsequent to a new tank installation or upgrade. [February 13, 1995 letter to Mr. Tanke]

Question 13: In changing over from one form of leak detection to another, is it necessary to finish up a twelve-month cycle with the old method in order to be in compliance?
[October 4, 1994 letter from Robert Staab of the Circle K Corporation]

Answer: Changing from on acceptable leak detection method to another can be done at any time. It does not require the completion of a "cycle." However, it is important that all leak detection records are properly maintained in accordance with 40 CFR 280.45.
[February 7, 1995 letter to Mr. Staab]

Question 14: Do I have to report a suspected release if my inventory control results from two consecutive months both exceed the performance standard, but one is short and the other is over? Does this "confirm the initial result"?
[Sept. 18, 1995 letter from Robert Stabb, Circle K Stores Inc.]

Answer: Yes, reporting is required. EPA interprets "confirm the initial result" at 280.50(c)(2) to mean a second exceedance, no matter whether the direction -- short or over -- is the same as the first month.
[December 12, 1995 letter to Mr. Stabb]

Question 15: When can I use the combination of tightness testing every 5 years and inventory control for leak detection on my upgraded UST?

Answer: Owners/operators may begin using the combination of inventory control and 5-year tightness tests only after the entire UST system meets 1998 standards. This means that the UST system must have corrosion protection for both tank and piping, spill, and overfill protection. The combination of inventory control and tank tightness testing may be used until 10 years after the tank itself has met corrosion protection requirements or until 12/22/98, whichever is later. After this time, another monthly method for release detection must be used.
[July 25, 1997 memorandum to State and Regional Program Managers]

Release Investigation, Confirmation, and Corrective Action (RICC)

Question 1: Are typical response actions of the utility industry to various types of confirmed releases from underground emergency generator tanks at nuclear power stations in conformance with the final UST corrective action regulatory requirements of 40 CFR 280.61(b) and 280.62(a)(1)?
[February 21, 1989 letter from Garah Helms of the Utility Solid Waste Activities Group, Edison Electric Institute]

Answer: When a release from an emergency generator tank is confirmed, the nuclear facility's owner and operator must begin to take immediate action to prevent further releases, including action that leads to the removal of as much of the regulated substance from the UST system as necessary.
[April 4, 1989 Letter to Mr. Helms]

Question 2: Does EPA require tank removal when a tank fails a tightness test? Is our company's site investigation checklist adequate?
[August 21, 1989 letter from R.C. Cronau of R.C. Cronau and Associates, Inc.]

Answer: Section 280.52 (a)(1) specifies that when a second tightness test is used to confirm a suspected release, the UST owner must "repair, replace, or upgrade the UST system and begin corrective action" if the system is non-tight. Thus, repair and upgrading is also allowed by EPA, in addition to tank removal. However, the actual approach followed is dependent on site conditions and the implementing agency's decision as to whether the initial abatement actions, site check activities, and corrective action measures necessitate tank removal. The submitted checklist is generally accurate, as far as it goes, for overfill type testing. It is not complete and does not incorporate level measuring or acoustic methods, and does not acknowledge the site check alternative mentioned in the regulations.
[December 1, 1989 Letter to Mr. Cronau]

Question 3: Is a constituent required to remove contaminated soil that is a result of a spill from over 40 years ago, if this contamination is discovered while recently installing a new tank?
[May 1991 letter from Senator Helms]

Answer: It is basically the state's decision as to whether the soil in the area of the old release must be removed. Continue to openly discuss this evolving situation with those responsible state officials, including whether this is already a leak from the operating USTs that must be addressed.
[Undated Letter to Senator Jesse Helms]

Question 4: Do old releases have to be reported?

Answer: Yes, owners and operators of USTs subject to the final rules must report both suspected and confirmed releases (see 40 CFR Part 280.50-3). There is no regulatory distinction between old or new releases, and it is technically difficult, if not impossible, to determine the age of a release. The

implementing agency can require proper closure (including site assessment) and corrective action at old sites suspected of having a release.
[There is no additional material included for this answer]

Question 5: Could EPA please clarify its final regulations for reporting releases from underground storage tanks?
[December 22, 1988 letter from Gregory P. Underwood]

Answer: Under the new regulations, any leak that is discovered must be reported immediately to the implementing agency and action undertaken by the owner and operator to stop additional releases.
[February 27, 1989 letter to Mr. Underwood]

Closure (CL)

Question 1: What are the closure requirements for tanks that were closed nearly 30 years ago? [January 25, 1990 letter from Senator Riegle]

Answer: The federal regulations do not require owners and operators of previously closed tanks to comply with the federal closure provisions unless directed to do so by the implementing agency. [February 16, 1990 letter to Senator Riegle]

Question 2: Are tanks that have not been in operation since 1980 subject to federal closure requirements? [March 1, 1990 letter from Congressman Leath]

Answer: No, however, each state implementing agency can adopt closure standards that are more stringent than the federal standards.
[March 28, 1990 letter to Congressman Leath]

Question 3: What are the closure standards for abandoned USTs?
[March 2, 1990 letter from Christopher Gilmore]

Answer: Tanks closed or abandoned after the effective date of the UST regulations (December 22, 1988) need to meet the federal closure requirements. However, state requirements can be more stringent than the federal requirements. Tanks closed or abandoned before December 22, 1988 need to meet the federal closure requirements only if the state implementing agency decides this action is necessary.
[Letter to Mr. Gilmore (date not legible)]

Question 4: Is EPA's 30 day notification requirement at closure really necessary?
[January 31, 1991 letter from Wallace Putkowski of Carbon Service Corp.]

Answer: EPA's 30 day prior notice requirement was intended to allow state or local agencies sufficient time to inform owners and operators what closure requirements to follow and perhaps enable arrangement of an on-site visit by a local inspector during closure. EPA's intent was not to automatically delay closure action for 30 days. EPA allows states to employ different approaches in this matter. Concerns about the need for change or flexibility should be directed to the state UST program.
[February 26, 1991 letter to Mr. Putkowski]

Question 5: Is the owner of a property in 1991 liable for the cost of removing and disposing of USTs that were part of a gas station and have not been used since 1976.
[April 23, 1991 letter from Congressman McEwen]

Answer: The question of liability for tank removal can be quite complex. The federal statute defines the owner of a tank that was in use before November 1984 but never used after that date as any person who owned the tank immediately before the discontinuation of its use. States, however, are not constrained by the federal definition of tank owner. Owners need to contact the state UST program.
[Undated letter to Congressman McEwen]

Question 6: Can closure requirements go back in time indefinitely?

Answer: Yes, if so directed by the implementing agency based on its judgment that the tank may pose current or potential threat to human health and the environment.
[There is no additional material included for this answer]

Question 7: Is an owner or operator who discovers a release at the site of an UST system closed prior to the effective date of the federal technical standards (December 22, 1988) subject to the corrective action requirements found in Subpart F of the technical standards?

Answer: Yes, the owner and operator of the UST system must comply with the corrective action requirements of Subpart F of the regulations, but are not required to comply with the requirements of Subparts B, C, D, and E except as referenced in Subpart F.
[There is no additional material included for this answer]

Question 8: Is a tank closed in the 1940s subject to the current closure requirements? If so, how many times must a tank be closed? What citations are applicable?

Answer: Under Section 280.73, this "previously closed UST system" is not required to be closed in accordance with Subpart G of Part 280 unless the implementing agency directs the owner or operator of the tank to follow such requirements. If a tank has already been closed in accordance with Subpart G requirements, it does not have to be closed again. Tank systems that have been previously closed or abandoned in a manner that does not meet all the Subpart G requirements can be required by the implementing agency to close again in accordance with all the Subpart G requirements if the implementing agency judges that the tank poses a current or future threat to human health and the environment.
[There is no additional material included for this answer]

Question 9: If a tank was abandoned long ago with product in it, would the response to question 8 (above) change? Would this tank still be considered previously closed?

Answer: There is no operator at the site since the UST system was no longer in daily operation. Since the property has changed several times since it was abandoned in the 1940s, there is not an owner at the site. EPA has no authority to require the current site owner to adhere to the closure requirements unless that

person owned or operated the tank at the time of it previous closure or abandonment. The previous owner and operator as defined in Section 280.12 could be required to do so if that person can be found. EPA expects that abandoned or previously closed systems that still contain liquid free product are likely to be readily deemed to pose a significant future threat to human health and the environment by the implementing agency.
[There is no additional material included for this answer]

Question 10: In general, if an owner/operator decides to "permanently close" his tank after December 22, 1988, regardless if the tank was closed or abandoned long ago, is he always required to comply with the final technical requirements of Subpart G?

Answer: If an owner/operator of the UST system, as defined under the regulations, voluntarily decides to undertake steps to permanently close a previously closed or abandoned tank, he does not legally have to comply with the final technical requirements of Subpart G unless directed to do so by the implementing agency under authority of Section 280.73. However, these owners and operators are not relieved of the requirement to perform corrective action, when a release is identified or confirmed at such a site, even in the absence of a directive to that effect by the implementing agency.
[There is no additional material included for this answer]

Question 11: Generally, an UST system temporarily closed for more than 12 months must meet either the new system standards, the upgrading standards, the permanent closure standards. Can an UST system be temporarily closed for more than 12 months, waiting to meet the upgrade requirements until 1998, when upgrades are actually required?
[November 18, 1992 letter from R. Steven Morton]

Answer: No, the actual upgrade requirements, including specific requirements for tanks such as interior lining and/or cathodic protection, and including specific requirements for cathodic protection of piping, must be met at the time temporary closure exceeds 12 months.
[February 23, 1993 letter to Mr. Morton]

Financial Responsibility (FR)

Question 1: Please clarify the term "occurrence." How is "occurrence" to be applied to leaking underground storage tank (UST) sites?
[September 1990 letter from the State of Virginia via Wayne Naylor, Region III]

Answer: Insurance industry practice is to consider all contamination discovered during a single site investigation to be one occurrence, regardless of the number of tanks or piping which may be leaking. On the other hand, leaks discovered at different times from the same UST system as a result of unrelated investigations would be considered two occurrences.
[October 15, 1990 memorandum to Mr. Naylor]

Question 2: Can the American Red Cross use net assets instead of tangible net worth to comply with the financial responsibility self-insurance test? Also, the American Red Cross does not file its annual report with the Securities and Exchange Commission (SEC) or obtain a rating from Dun & Bradstreet. Can we use double audit opinions by Deloitte & Touche and the U.S. Army Audit Agency in lieu of the CPA opinion?
[October 4, 1990 letter from Christopher E. Mandel of the American Red Cross]

Answer: No, the Red Cross is unable to use the self insurance test because, as a non-profit, the financial statements are not developed according to Generally Accepted Accounting Principles which was assumed during development of the test. In addition, as required by Part 280 (b)(4)(i), the double audit would not ensure access by the implementing agency to the current financial statements in a format that allows for verification of compliance with the requirements of the financial self-test.
[Undated letter to Mr. Mandel]

Question 3: Can New Jersey Transit, which is a public transit agency under State control, be classified as either a State Agency or a local governmental entity for purposes of the financial responsibility regulations?
[October 11, 1990 letter from Shirley DeLibero of New Jersey Transit]

Answer: New Jersey Transit does not qualify as a State agency under Part 280.90(c) because the debts of New Jersey Transit are not the debts of the State of New Jersey. New Jersey Transit qualifies as local government for purposes of the financial responsibility regulations: in the local government proposed rule 55 FR 24695 (June 18, 1990), the preamble mentions transit authorities as an example of special purpose local governments and suggests that this category includes districts created by State enactment 55 FR 24696).
[October 24, 1991 letter to Ms. DeLibero]

Question 4: Please explain allowable limitations to on-site corrective action with regard to insurance policy form and content.
[January 11, 1991 letter from Craig Stanovich of the Braley and Wellington Insurance Agency Corp.]

Answer: As explained in 53 43322, 43348, on-site corrective action coverage is required in insurance policies which are to be used as mechanisms to demonstrate financial responsibility. Thus, coverage limited to "the existence of imminent and substantial danger to third required corrective action coverage. Exact wording as described in Part 280.97 is required in either an endorsement or a certificate of insurance.
[Jan 11, 1991 letter to Mr. Stanovich]

Question 5: Please define corrective action in order to determine if insurance policies in West Virginia comply with the financial responsibility requirements.
[February 8, 1991 request for clarification from West Virginia via Region III]

Answer: EPA has never formally defined "corrective action" in our rules. However, Subpart F -- Release, Response and Corrective Action for UST Systems Containing Petroleum or Hazardous Substances -- is generally viewed as the corrective action section and explains required procedures.
[March 29, 1991 note to Mr. Naylor]
[March 29, 1991 letter to Ms. Ehlert]

Question 6: Can Wyoming exclude releases under 25 gallons from its regulatory program and still receive State fund approval? With this 25 gallon exclusion, would Wyoming qualify as an approved State program?
[March 1991 request for clarification of Wyoming's Statute by Region VIII regarding the definition of "release."]

Answer: Wyoming's definition of "release" may be acceptable in the context of State fund approval because the requirement to respond immediately to releases less than 25 gallon is found in Subpart E of the UST rules - Release Reporting, Investigation and Confirmation. It can be reasonably argued that the State fund is not obligated to cover these activities because they are not required to be performed under Subpart F.

This "release" definition, however, is not acceptable with regard to State program approval because the Federal definition of release (Part 280.12) is identical to Wyoming's definition except for the 25 gallon exclusion in the stature. While reporting spills is not required, Subpart E of EPA's regulations requires spills of any size to be immediately contained and cleaned. Based on this discussion, we believe that Wyoming's definition of release would be less stringent than the Federal program allows.
[March 29, 1991 letter to Ms. Ehlert]

Question 7: Please clarify the definitions of tangible net worth and net working capital. Also, are non-profit organizations subject to the EPA financial responsibility regulations?
[March 15, 1989 letter from Christopher J. Franki of the Insurance Buyer's Council, Inc.]

Answer: EPA defines tangible net worth as the tangible assets that remain after deducting liabilities; such assets do not include intangibles such as goodwill and rights to patents or royalties. The standard definition of working capital is current assets minus current liabilities. Unused borrowing capacity is not considered part of the standard definition of working capital.

The non-profit community service corporation that your firm represents is considered a non-marketer. If the non-profit organization can meet the criteria in the self-insurance test, they can use that mechanism to comply with the financial responsibility requirements. Otherwise, the other mechanisms could be used to demonstrate compliance such as a State fund or private insurance. The local government financial test is targeted to general purpose and special purpose local governments and may or may not apply to non-profit organizations.
[April 6, 1989 letter to Mr. Franki]

Question 8: Please clarify the compliance date for non-marketers that do not report to Dun & Bradstreet. What does it mean to "report to Dun & Bradstreet?
[December 28, 1988 letter from Dean Ziegel of Rivkin, Radler, Dunne & Bayh]

Answer: According to Part 280.91(d), privately-held non-marketers owning USTs which do not report to SEC, D&B, etc. are considered to be in Category 4 for financial responsibility compliance purposes. A firm "reports" to Dun & Bradstreet if the firm provides information about the firm's net worth or other information that can be used to determine net worth, or if Dun & Bradstreet publishes a rating for the firm.
[April 6, 1989 letter to Mr. Ziegel]

Question 9: Can Region VII release in excess of $2 million held in a fully funded trust fund that is partially funded with marketable securities? How should the marketable securities be valued?
[April 1, 1991 memo from Region VII regarding Fisca Oil Co.]

Answer: The Federal financial responsibility regulations (Part 280.102) state that "if the value of the trust fund is greater than the required amount of coverage, the owner or operator may submit a written request to the Director of the implementing agency for release of the excess." Upon release of such funds, in the case of a fully funded trust fund that is in full or in part funded by marketable securities, those securities should be valued at the lower of cost or market value until such time as the loss or gain is realized.
[March 28, 1991 memorandum to Mr. McLaughlin]
[April 01, 1991 memorandum to Regional Program Managers]

References

Applicability, Definitions, and Notification References

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. Larry Hunt, P.E. President
Hunt & Hunt Engineering
P.O. Box 771294
Houston, Texas 77215

Dear Mr. Hunt:

This responds to your letter of December 2, 1988 to Mr. Mike Scoggins of our EPA Region VI office in which you requested information regarding the applicability of EPA's final underground storage tank (UST) regulations (40 CFR Part 280) to process waste traps (oil-water separators) located at various Schlumburger manufacturing and metal finishing facilities. The UST technical standards went into effect on December 22, 1988 and the financial responsibility requirements on January 24, 1989. As we were responsible for promulgating these rules, Mr. Scoggins has asked us to respond to you directly.

Some UST systems are excluded from subtitle I regulation in the statute (For example, septic tanks and storm water or waste water collection system tanks). The statute does not include a specific exclusion of oil-water separator tanks, however. The final EPA technical standards provide further regulatory definition of the various exclusions and also contain regulatory exclusions and deferrals (from most Subtitle I regulatory coverage) of various UST systems. In general, oil water separator systems are either excluded or deferred from the regulation. The relevant regulatory exclusions and deferrals are briefly discussed below.

<u>Waste water treatment tank systems that are part of a waste water treatment facility and are subject to regulation under either section 402 or 307 (b) of the clean Water Act (CWA)</u> are excluded from all Subtitle I regulation. All publicly owned treatment works and many private treatment facilities are subject to the CWA and therefore excluded from subtitle I regulation. Facilities regulated under the CWA are required to be permitted in order to discharge treated water to any U.S. surface waters. Because of this, EPA has decided that

additiona l regulation under subtitle I is unnecessary to protect human health and the environment. The separators that you described in your letter are connected directly to a city sanitary service (i.e., a POTW). Because your oil water separators are discharging to a POTW and thus must meet treatment standards under 307 (b), your oil water separators are excluded from regulation under subtitle I. (see further discussion page 37108 of the preamble to the September 23, 1988 regulations).

Tank systems that treat waste water or storm water, but are not subject to Section 402 or 307(b) of the CWA are deferred from having to meet the requirements of subparts B through E and G. Such tanks include oil-water separators that do not discharge to a POTW or have an National Pollution Discharge Elimination System (NPDES) permit (or subject to a zero discharge effluent guideline). Tanks that pretreat and hold waste water that is periodically removed and hauled by truck to a treatment facility may be in this category. Under this regulatory deferral, such tanks would still have to comply with corrective action (should a release occur) and financial responsibility requirements of Subpart H. A discussion of this deferral is found on pages 37109-37110 of the September 23 preamble to the regulations.

Similarly, field-constructed tanks are deferred from the requirements in 40 On Part 280, subparts B through E and G of the final UST regulations. Generally these tanks are made of concrete or constru cted at the site (for example, concrete poured into forms or otherwise fabricated in the field). EPA has deferred the application of the regulations (except for corrective action and financial responsibility requirements). see page 37110 of the September 23 preamble for a discussion of why field constructed UST systems have been deferred.

In summary, based on the information provided with your letter of December 2, EPA believes the oil-water separators you described are exempt from the final subtitle I regulations because the separators discharge to a POTW. If they are not subject to regulation under the CWA and thus excluded, they are deferred from most of the provisions of subtitle I regulation under the waste water treatment tank or field constructed tank system deferrals.

I hope this response provides the clarifications you need.

Sincerely,

/s/

Thomas Schruben
Environmental Engineer
Office of Underground Storage Tanks

cc: Kirsten Engle, EPA Office of General Counsel
Michael R. Scoggins, LUST Program, EPA Region 6
Dwight Russell, Texas Water Commission

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. Elmer Street
Drawer N
Oakwood, Virginia 24631

Dear Mr. Street:

You wrote to us with the request to identify who is responsible for underground storage tanks you own but are rented and subleased to other parties. You said that four underground storage tanks (USTs) are going to be closed at this site.

The new technical standards for USTs include requirements for properly closing tanks, inspecting the site for contamination, and taking corrective action if needed. The new EPA regulations for USTs are generally applicable to "owners and operators" to make sure that at least one of these parties is held legally responsible. However, the regulations do not clearly specify in those instances where there is both an "owner" and "operator" whether it is the "owner" or the "operator" who must take corrective action or is liable for pollution costs. The regulations hold both the owner and operator of the UST responsible. Thus, in your case, EPA could hold all three parties responsible for assuring compliance with the closure regulations. These legal matters may also depend on how "owner" and "operator" are defined in your State UST program. One thing is certain: owners and operators need to discuss these issues and decide among themselves who is going to assure that the requirements are met. These decisions will also need to be made if you continue to have operating USTs and therefore have to meet the general technical and financial responsibility requirements.

Cases such as yours underscore the complexity involved with multiple owners and operators. We will look to all three parties in your instance to decide and agree who will assure the required actions are taken. All three parties could be subject to enforcement action should noncompliance be discovered.

For your information, I am enclosing copies of two new brochures

-- "Musts for USTs" and "Dollars and Sense." These brochures provide clear summaries of the regulations in "plain English."

I hope this information is helpful.

Sincerely yours,

/s/

Jim McCormick, Director
Policy and Standards Division
Office of Underground Storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

September 8, 1990

Mr. R.G. MacDiarmid
Goetting & Assooiates
Suite 500
Renaissance Plaza
San Antonio, Texas 78216

Dear Mr. MacDiarmid:

Thank you for your letter in which you requested clarification of several points concerning the underground storage tank regulations as they appeared in the Federal Register (Volume 53, No. 185, September 23, 1988). The responses below are numbered to correspond with the questions you have asked.

1."Deferred" means that these tanks are currently subject to some parts of the regulations, as described in the subsections on pages 37109-37113 of the Federal Register. Because the Agency has not yet decided in what way these tanks should be subject to additional parts of the regulations, it is continuing to evaluate the applicability of the full regulations to these tanks. For example, the emergency generator tank deferral, which appears to be of particular interest to you, temporarily defers only Subpart D of the regulations, which concern release detection: "EPA is deferring Subpart D requirements for these tanks to allow time to develop workable release detection requirements for these tank Systems" (FR 37113).

2. A. You are correct in assuming that the reference to "Subtitle D." should read "Subpart D" in the sentence you have quoted from FR 37109.

B. The deferral for UST systems associated with emergency generators, as it appears on FR 37113, makes no distinction as to the location of the emergency generator. Although the discussion in the regulations focuses on remote utility sites, the deferral would apply to any UST system that serves an emergency generator.

I hope this information is useful to you and responds fully to your questions. If I can be of further assistance. please do not hesitate to contact me.

Sincerely yours,

/s/

Ronald Brand, Director
Office of Underground Storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 25, 1989

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Whether a Concrete Vaulted UST System is Subject to the Underground Areas Exclusion

FROM: David O'Brien, Chief /s/
Standards Branch, OUST (OS-410)

TO: Wayne S.. Naylor, Chief
Underground Storage Tank Section (3HW31)

This is in response to your July request from Virginia as to whether a precast Concrete vaulted tank system housing a tank below grade is exempt from 40 CFR part 280 requirements. The answer to this request is yes,"if the tank sits upon or above the surface of the floor and there is sufficient space to enable physical inspection of the tank bottom." (53 FR 37121). As explained in the preamble, such tanks, although technically underground, are no different than above ground tanks and are therefore included in the Law's underground areas exclusion.

For your information, we have no authority to withhold this interpretation (which is already provided in the final rule's preamble) from the Virginia Water Control Board contingent upon receiving a certification from a professional engineer to ensure the accuracy of the proposed design's structural integrity. Therefore, we did not review the structural calculations that were provided.

It may be worth pointing that such concrete vaulted system would appear to have to satisfy Virginia Building Codes, aboveground tank fire safety codes (e.g., NFPA 30), and if applicable, SPCC aboveground tank regulations currently under consideration for revision within EPA.

cc: Jim McCormick

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

December 3, 1989

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. James E. Wisuri
Manager of Communications
Steel Tank Institute
728 Anthony Trail
Northwood, Illinois 60062

Dear Mr. Wisuri:

This in response to your inquiry dated July 14, 1989, to Mr. Richard Wilson concerning the regulatory status of methanol and methanol-blend fuels.

Methanol is listed under section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, and, therefore, must be stored in a hazardous substance UST system. In addition, M85 must also be stored in a hazardous substance UST system because it contains 85% of a CERCLA-listed substance. Gasohols containing lesser amounts of methanol (generally, 2.5% to 5%) may be stored in petroleum UST systems.

Methanol and M85 can be stored in new petroleum UST systems, if the owner or operator demonstrates that their method of release detection meets the requirements for release detection for petroleum UST systems. In addition, the owner or operator must provide information to the implementing agency about corrective action technologies, site characteristics, and properties of the stored substance. Variances may be obtained on a case-by-case basis from the implementing agency where they allow them.

Under the federal rules, Methanol and M85 can be stored in existing, single-wall UST systems until December 1998, if the regulatory requirements for release detection are met. A variance is not required in this situation. Attached is a recent issue paper that was provided to the EPA Regions and States on the above matter.

Please be advised that some States and local governments require secondary containment of all UST systems (e.g., California, New York, New Hampshire, and Austin, Texas) and the Federal law specifically allows them to be more stringent than EPA's requirements if they choose.

I hope this responds to your need for clarification in this area.

Sincerely,

/s/

David O'Brien, Chief
Standards Branch

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT 6, 1989

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Honorable Howell Heflin
United States Senate
Washington, D.C. 20510

Dear Senator Heflin:

Thank you for your referral (dated September 19, 1989) of a letter from your constituent, Rev. Aloysius Plaisance, who sought information about EPA's new regulations for underground storage tanks (USTs).

Rev. Plaisance wondered if the monastery 's USTS would not be subject to the UST regulations. Your constituent is correct in assuming that the monastery can be considered the residence of the monks who live there. Therefore, the monastery's two 500-gallon USTs do not need to meet the UST regulatory requirements, as long as they store motor fuel that is noncommercially used only by the monastery's residents. (The regulatory exclusion is for farm and residential Lists of 1,100 gallons or less storing motor fuel used for noncommercial purposes.)

Nevertheless, the safe operation and maintenance of the USTs should be of concern to your constituent. Residents of the monastery should be watchful for any signs that their USTs may be leaking. Some of these signs are unexplained gasoline odors, oil sheens on nearby surface water, or dead vegetation near the UST. They should respond quickly to such signs by calling their local fire department and taking action to correct the problem.

Since your constituent [1]s USTs are not subject to the UST regulations, I assume he would not need a copy of the regulations, as he had originally requested. If there is a need for a copy please let me know and we'll have one sent right away. Please do not hesitate to contact me if I can be of ant further assistance.

Sincerely yours,

/s/

Ronald Brand, director
Office of Underground Storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JAN 19, 1990

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Alan C. Campbell
Dow, Lohnes & Albertson
1255 Twenty-third Street, N.W.
Washington, D.C. 20037

Dear Mr. Campbell:

This is in response to your December 27, 1989 letter forwarding an earlier letter request by Jane Oglesby for an advisory opinion from the Environmental Protection Agency's office of General Counsel. I do not have any record of the first request. In any case, I apologize for any delay that may have occurred.

According to Ms Oglesby's letter, your firm is interested in determining the allocation of responsibility between the owner and operator of an underground storage tank ("UST") under the technical and financial responsibility regulations promulgated by the EPA on September 23, 1988 and October 26, 1988. The fact situation posed by Ms. Oglesby concerned an UST leased to and operated by a private corporation solely for the purpose of powering an auxiliary generator, while actual title to the UST is held by the Federal Communications Commission.

The answer described paragraph 1 of Ms. Oglesby's letter concerning compliance with the UST financial responsibility regulations appears to be accurate, though the reasoning is incomplete. Section 280.90(c) of the financial responsibility regulations read, "State and Federal government entities whose debts and liabilities are the debts and liabilities of a state or the United States are exempt from the requirements of this subpart." This provision exempts the State or Federal government entity from compliance with the financial responsibility regulations where the State or Federal government entity is an owner or an operator of an UST. According to the preamble to the final financial responsibility regulation, EPA determined that it was not necessary to require that such entities demonstrate financial assurance as EPA assumed that they have the requisite financial strength and stability to pay for corrective action and third party liability costs arising from UST releases. 53 Fed. Req. 43322, 43328 (1988). EPA interprets the regulations to mean that government entities covered by Section

280.90(c) have demonstrated financial responsibility. Under §280.90(e). the requlations read that, if the owner or operator of a tank are separate persons, only one person is required to demonstrate financial responsibility. Thus. the operator of an UST that is owned by the federal government is not required to demonstrate compliance with the financial responsibility regulations. However, you should note that 280.90(e) also states that both the owner and the operator are liable in the event of noncompliance with the financial responsibility requirements in general.

The discussion in paragraph 2 of Ms. Oglesby's letter does not appear to be correct. According to the letter, the Hotline stated that the operator of the UST is primarily responsible for ensuring compliance with the notification, reporting and record-keeping requirements under 40 CFR 280.22 and 280.34.

The individual, subsections of § 280.34 specifically state that 'owners and operators' must comply with the reporting and recordkeeping requirements. While it may be easier for the operator of an UST to comply with these requirements. the regulations do not distinguish between owners and operators and thus do not establish that the operator is "primarily responsible" for ensuring compliance with these provisions.

The provisions of 230.24 impose some requirements on owners exclusively and some on both owners and operators. A careful reading of this section is necessary to determine whether only one or both parties may be liable in the event of noncompliance. Nothing in the language of this section would suggest, however. that compliance with the notification requirement is "primarily" the responsibility of the UST operator.

Finally, Ms. Oglesby's letter requested that EPA provide an advisory opinion stating that the owner of an UST will be held primarily responsible for ensuring compliance with the upgrading requirements under 40 CFR 280.21. Section 280.21 states that, not later than December 22, 1998, all existing USTs must comply with that provision's tank upgrading requirements. The language of 280.21 does not specifically assign this responsibility to the UST owner. operator, or both parties. However, section 280.10, the applicability provision for the technical regulations, states in relevant part that, "[t]he requirements of this part apply to all owners and operators of an UST system." Thus the requirements under §230.21 apply to both the owner and the operator of an UST system. Again, the regulations do not provide that the owner will be held "primarily" responsible for complying with this requirement.

I hope this letter provides your firm with useful guidance. If you have any further questions concerning these inquiries, feel free to contact me at (202) 382-7706.

Sincerely,

/s/

Kirsten Engel

cc: Jim McCormick
Sammy Ng
Dave O'Brien
Office of Underground Storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

March 20, 1990

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Ms. Frances E. Phillips
Gardere & Wayne
Suite 1500
717 North Harwood Street
Dallas, Texas 75201

Dear Ms. Phillips:

This responds to your January 30 letter about the exclusion of storage tanks located in an underground area such as a basement, vault or tunnel from the underground storage tank requirements of Subtitle I of the Resource Conservation and Recovery Act. Specifically, you wanted to know if language in the UST rule's preamble about the underground area exclusion was intended to imply that tanks in vaults are no different than above-ground tanks and should be regulated as such.

The preamble's reference to tanks in vaults as being, in a practical sense, no different from above-ground tanks was simply meant to contrast vaulted systems as basically free from the problems that attend underground storage tanks and cause them to leak. External galvanic point corrosion, improper backfill support, and installation, hidden-from-view piping failures, and spills and over-fills into the environment are the main problems addressed by the UST regulations. In contrast, vaulted tanks are thicker tanks subject to different manufacturing codes than USTs , are not subject to accelerated point corrosion, do not have backfill support and installation problems, are fully able to be visually inspected (Unlike USTs), and should contain spills and overfills from leaking into the environment. Thus, it is really unnecessary to apply the UST requirements to vaulted tnanks systems. The Agency focused on the ability to physically inspect vaulted tank systems as the distinguishing factor that is easily used by EPA to establish if any particular tank system is within the law's underground area exclusion.

Our preamble discussion was not intended to imply that vaulted systems should be regulated the same as above-ground tanks, (to the extent there may be federal, state, or local above-ground tank requirements now or in the future). Your typical above-ground tank is not in an enclosed space that is completely contained by a concrete barrier. Thus, the application of above-ground tanks Standards to the relatively new design concept of vaulted tank Systems may not be technical appropriate. For example, some major American corporations who are very concerned with environmental liability issues (such as IBM) have decided to have exclusively use vaulted tank systems because they are believed to be a relatively protective storage approach, and perhaps even more fault-free than above-ground storage tank operations that most often rest on top of the ground and are surrounded by a man-made berm.

I hope this removes your confusion and clarifies why we mentioned above-ground tanks in the UST regulation preamble discussion of the underground Area exclusion and its applicability to vaulted tanks. In summary, it was simply meant to point out that above-ground tanks and vaulted tanks are similarly inspectable and therefore not subject to the common failure modes of UST systems.

Sincerely,

/s/

Ronald Brand, Director
Office of Underground Storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APRIL 19, 1990

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Interpretation Request

FROM: David O'Brien, Chief Standards Branch /s/

TO: Gerald. Phillips, Chief
Office of UST/LUST, Region V

This is in response to your request of March 26, 1990, regarding the underground storage of 3 products (Alkylate H-230H, Aristol 360, and, Aristol 400) comprised of a mixture of the C14-C30 alkyl derivatives of benzene.

These substances are not regulated under 40 CFR Part 280.

These substances are not listed under section 101(14) CERCLA. Benzene is present in trace or de minimus quantities, which does not effect their status as non-regulated substances.

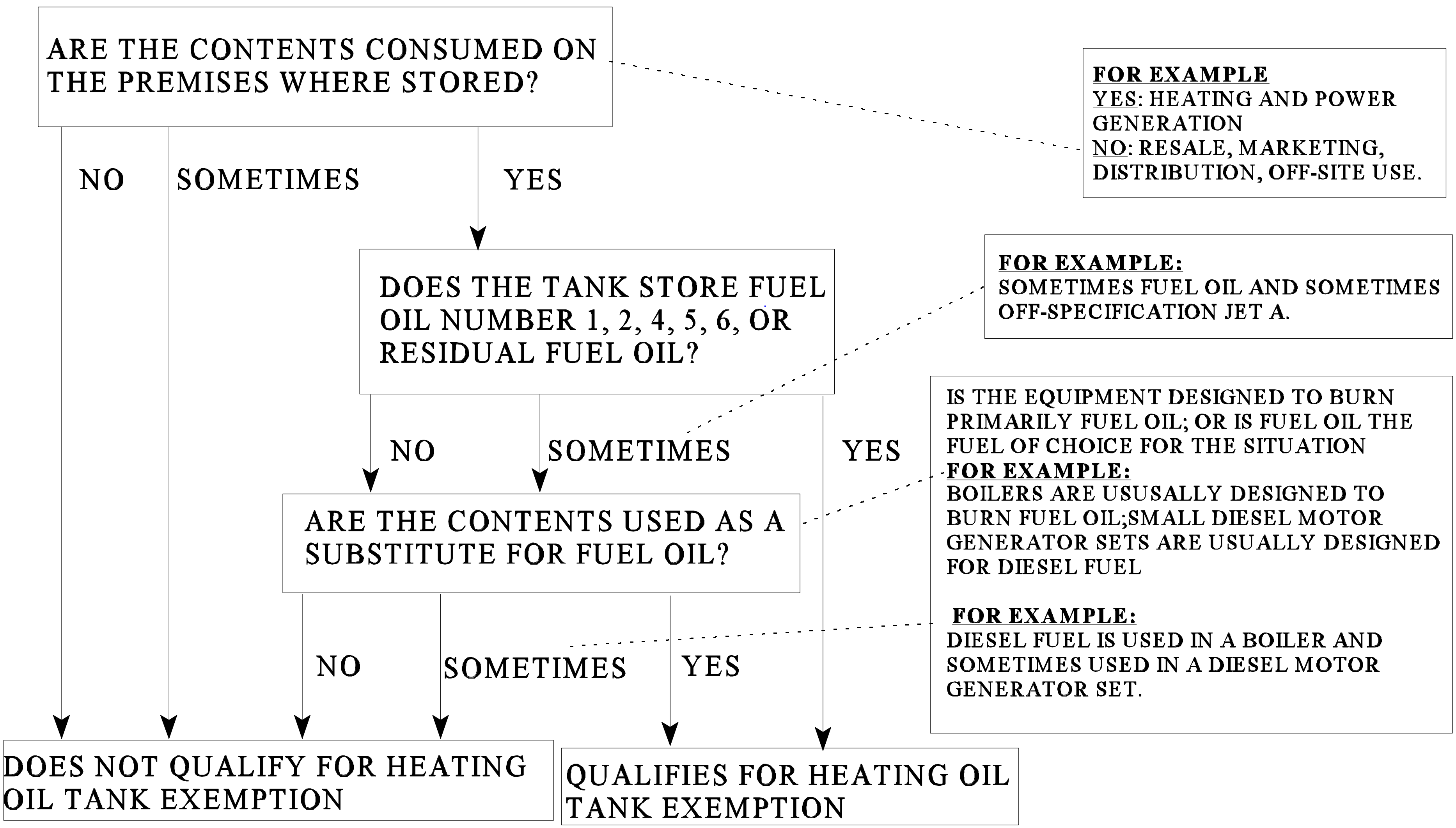
These substances do not belong in one of the general categories of petroleum -- motor fuel, jet fuel, distillate fuel oil, residual fuel, oil, lubricant, petroleum solvent, or used oil; are not a fraction of petroleum or crude oil; and are not derived from crude oil through processes of separation, conversion, upgrading, and finishing,

These substances are called "petroleum oil" for freight purposes because of their petroleum-like properties -- they are viscous, oily, less dense than water, and practically insoluble in water. They are also non-flammable and are used in the manufacture of detergents.

If you have any further questions please contact Mike Kalinoski 8-382-4759.

Does my tank qualify for the heating oil tank exemption?

DECISION TREE **NOTES**



Fiberglass Petroleum
Tank + Pipe Institute
One Seagate, Suite 1001
Toledo, Ohio 43604-1560
419-247-5412
Fax 419-247-5421

May 29, 1990

Ronald Brand, Director
Office of Underground Storage Tanks
Environmental Protection Agency
401 M Street Southwest
Mail Code OS 410
Washington, DC 20460

SUBJECT: TANK SELLERS NOTIFICATION OBLIGATIONS

Dear Ron:

Since October 24, 1988 EPA has required that "... any person who sells a tank to be used an underground storage tank <u>must notify the purchaser</u> of such tank of the owners notification obligation under 40 C.F.R. paragraph 280.22 (a). The form provided in Appendix III of this part <u>may be used</u> to comply with this requirement."

The suggested language in Appendix III is dated. We request your review and approval of the following statement to be used in lieu of the Appendix III language.

> "EPA regulations (40 C.F.R. Section 280.22 (a)) require owners of certain, new underground storage tanks to notify designated State or local agencies of the existence of such tanks within 30 days of bringing such tank into use. Consult these regulations to determine if you are affected by this notification requirement"

This is to request a written opinion from EPA approving use of this statement, or your suggestions for modification.

Very truly yours,

/s/

E. C. Nieshoff
Executive Director
Fiberglass Petroleum
Tank and Pipe Institute

ECN/cas

cc: Fiberglass Petroleum Tank and Pipe Institute Members

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JULY 11, 1990

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

E.C. Nieshoff
Executive Director
Fiberglass Petroleum Tank and Pipe Institute
One Sea Gate, Suite 1001
Toledo, Ohio 43604-1560

Dear Ed:

The wording quoted on your May 29 letter to me appears to be appropriate for informing the purchaser of a new underground storage tank of his responsibility to notify the implementing Agency. As you know, sellers of UST systems must so inform tank purchasers under the statute's provisions in section 9002(a)(6). Admittedly, the wording in Appendix III to Part 280 is somewhat dated and I believe your suggested wording conveys the intent of that earlier guidance. Thus, it may also be used to Comply with the se11er’s requirements contained in 40 CFR 280.22(a).

I hope this clarification is sufficient for your needs.

Sincerely,

/s/

Ron Brand, Director
Office of Underground Storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

November 1990

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. David England
Council President
Stewartstown Borough
P.O. BOX 415
Stewartstown, PA 17363

Dear Mr. England:

The Environmental Protection Agency (EPA) has been requested by Senator Arlen Specter to respond directly to your September 25, 1990 letter to him concerning the EPA's underground storage tank (UST) regulations and your question of why municipalities were not exempt from them. The Agency's Office of Underground Storage Tanks completed the UST regulations over two years ago, and therefore is in the best position to respond to your letter.

Let me first confirm that there is an exemption in the EPA regulations for USTs storing less than 1100 gallons of motor fuel for "non-commercial" purposes. This farm and residential small tanks exclusion comes directly out of the Federal statute (the Resource conservation and Recovery Act, as amended, section 9001(1)(A)). However, this exemption did not extend to small underground storage tanks owned by municipalities and EPA determined there was no technical basis to broaden in the regulations the law's specific exemption in this area.

For your information the EPA regulations do not apply to above ground tanks of any size. Thus, in your letter you may be referring to tank requirements that have been passed by the State of Pennsylvania. Of course the State can be different or even more stringent than EPA's regulations in this area. For further information about possible Pennsylvania requirements we suggest you contact the following person:

Mr. Foster Diodato
PA Dept. of Environmental Resources
Bureau of Water Quality Management
Storage Tank Section

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

August 12, 1991

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. Thomas F. West
Executive Director
National Association of Texaco Wholesalers, Inc.
6551 Loisdale Court, Suite 100
Springfield, VA 22150

Dear Mr. West:

This responds to your May 14, 1991 request for clarification from EPA's Office of Underground Storage Tanks (OUST) as to whether compartmentalized underground storage tanks (USTs) are considered one tank for purposes of regulation under subtitle I of the Resource conservation and Recovery Act, as amended (RCRA).

Please be informed that OUST considers an underground tank vessel with compartments to be a single tank system for purposes of the 40 CFR Part 280 regulations. A compartmentalized tank vessel is manufactured in essentially the same way as all other single tanks. It is also transported, installed, and protected from external corrosion as a single unit. Thus, dividing such tanks internally into compartments does not change its single tank status under the regulations. In sum, a compartmentalized UST and the underground piping connected to it are considered a single tank system by the EPA.

Of course, under section 9008 of RCRA, state or local UST programs are allowed to "adopt or enforce any regulation, requirement or standard of performance respecting underground storage tanks that is more stringent" than federal requirements. Thus, states and local governments are free to interpret this question of compartmentalized tanks differently for purposes of state regulation or local ordinances, including their notification and financial responsibility requirements. We advise you to check with those officials directly to assure you understand state and local policies on this matter in their respective jurisdictions.

I hope the above information provides the clarification you seek on this matter.

Sincerely,

/s/

David W. Ziegele, Acting Director
Office of Underground Storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Honorable Jim Jontz
United States House of Representatives
302 East Lincolnway
Valparaiso, Indiana 46383

Dear Congressman Jontz:

Thank you for your May 16, 1991 letter to the Environmental Protection Agency (EPA) concerning whether an underground storage tank (UST) owned by one of your constituents, Mr. John Womer, is exempt from EPA regulations addressing USTs under Subtitle I of the Resource Conservation and Recovery Act (RCRA). Apparently Mr. Womer owns a 550 gallon UST storing gasoline that is used to support his nursery and landscaping business in Porter County, Indiana.

The exclusion referred to by Mr. Womer is found in the Federal statutory definition of underground storage tank, which does <u>not</u> include any “farm or residential tank of 1,100 gallons or less capacity used for storing motor fuel for noncommercial purposes”. Generally, this “farm tank” exclusion applies to such USTs located at nurseries where the products for retail stores, garden centers, or landscaping businesses are grown and the fuel is used tor that agricultural purpose. Mr. Womer's letter-provides an assurance that the fuel is not sold commercially. Thus, the tank described in his January 12, 1991 letter appears to be a farm tank and not subject to EPA's UST regulations.

It is unfortunate that Mr. Womer's initial letter was lost. Apparently, he sent it to a publications office at a separate address and it was never forwarded to the Office of Underground Storage Tanks. I hope this response satisfies his concerns.

Sincerely,

/s/

David W. Ziegele, Acting Director
Office of Underground Storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Ms. Laura H. Thomas
Marketing Manager
York International
P.O. Box 1592
York, Pennsylvania 17405-1592

Dear Ms. Thomas:

This responds to your August 5, 1991 request for clarification as to whether the York Iceball Thermal Storage system is subject to regulation under subtitle I of the Resource Conservation and Recovery Act, as amended. Your letter described a process whereby a 25% ethylene glycol 75% water solution is circulated underground between the iceball storage tanks and chillers for the purpose of air conditioning a building during daylight hours.

It would seem that the iceball cooling storage system you have described is exempt from the 40 CFR Part 280 underground storage tank requirements under the exclusion found at 280.10 (b) (3) for “equipment or machinery that contains regulated substances for operational purposes such as hydraulic lift tanks and electrical equipment tanks.”

In sum, the primary purpose of the iceball tank is a heat exchanger for cooling purposes. If there was a leak in the tank containment vessel or attached piping the primary purpose of the tank would be quickly defeated. This is the same situation as for hydraulic lift and electrical equipment tanks. Thus, the “operational tanks” regulatory exclusion applies to the York iceball tank system.

I hope the above provides the clarification you seek.

Sincerely,

/s/

David O'Brien, Branch Chief
Technical Standards Branch

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

August 26, 1991

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. William G. Nowman, President
Halissco, Inc.
6601 North Black Canyon Highway
Phoenix, Arizona 85015

Dear Mr. Nowman:

This responds to your August 21, 1991 letter to Administrator Reilly about your need for clarification of a portion of the Environmental protection Agency's (EPA) underground storage tank (UST) regulations that were promulgated under Subtitle I of the Resource Conservation and Recovery Act as amended. Your question pertains to the way the 40 CFR Part 280 regulations address vaulted tank systems buried in the ground.

Your letter suggests there is a lack of clarity in the UST regulations about how much space is necessary between the tank vessel and the surrounding open vault to allow for physical inspection. This question is important because tanks that can be physically inspected for leaks are considered to be the same as aboveground tanks, and thereby excluded from the UST rules under the “underground areas exclusion” provided in the statutory definition of underground storage tanks. Your general concern is that there are some vaulted tank systems for sale in the market that do not allow complete physical inspection of all sides of the tank vessel because the tank shell is located too close to the side walls of the vault.

In your letter you provided a specific example of a tank that is within six inches of the vault's walls on three sides, but is, set back far enough along the fourth side of the tank to allow room for human entry and inspection. Such a tank system would be considered to be physically inspectable by EPA, and therefore not subject to the Agency's UST regulations under the “underground areas exclusion”, if the access provided on the fourth side of the vaulted is sufficient to enable a person to observe evidence of a leak from anywhere on the tank vessel. Thus, if the tank is in a saddle and the bottom of the vault can be viewed. in order to check for evidence of a leak then the tank is considered to be inspectable.

It is our belief that the underground areas exclusion in the statute was intended by Congress to exempt from the UST rules those tank systems that area: (1) out in the open and not surrounded by backfill (and therefore not subject to the primary failure mode of existing USTs: external corrosion); (2) not hidden from visual inspection for leaks (the same as above-ground tanks); and (3) built and installed according to the above-ground tank consensus codes of practice. Thus, meeting the physical inspectability criterion that is discussed in the preamble to the rule. (45 FR 37121 September 23, 1989) is determined by whether inspector can access the tank system sufficiently to assure it is not supported by backfill, can be visually checked for evidence of leaks, and is built to an above-ground tank code. Such a tank system is not subject to EPA'S underground tank regulations.

I hope the above information provides the clarifications you seek. If you have further questions on this issue please contact me.

Sincerely,

/s/

David Ziegele, Acting Director
Office of Underground Storage Tanks

(OS-410(WF) :DO'brien:bmt:308-8853:9/23/91:DISC#c::memo.bmt)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

October 7, 1991

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. James J. Hamula
Kimball and Curry, P.C.
2600 North Central Avenue
Suite 1600
Phoenix, Arizona 85004

Dear Mr. Hamula:

This responds to your August 28, 1991 letter on behalf of a major Arizona Utility to Dave O'Brien of this office in which you request EPA's opinion on the applicability of the “emergency spill or overfill containment” exemption in 40 CFR Section 280.10(b)(6) to sumps used to contain diesel fuel discharges from electric power generation turbines. These sumps are designed to receive the diesel fuel discharges from the turbine in the event or a false start.

Your letter describes the sumps in question as constructed of non-earthen materials (e.g., concrete or steel), with a volume of no more than 350 gallons, and connected to the turbines by way of an enclosed conduit (e.g., pipes). You admit false starts do occur from time to time and that on those occasions small amounts of fuel are discharged directly from the turbine into the sump (about 20 gallons) Immediately after the false start occurs, you report that utility personnel remove the diesel fuel from the sump.

Excluded from the 40 CFR Part 280 regulations under section 280.10 (b)(6) are "any emergency spill or overflow containment UST system that is expeditiously emptied after use." As stated on p3709 of the September 23, 1988 preamble, "by including this exclusion in the final rule, the Agency believes that any potential confusion regarding the need for secondary barriers (containment) for secondary barriers (containment) systems has now been eliminated." The sump collection/storage system described in your letter in no way resembles a secondary containment barrier. It is described (by you) as simply a storage tank into which your client periodically discharges (for temporary storage) unburned fuel from their turbines when they false start. Also the event you describe is not an emergency spill, leak or other unplanned occurrence. The very fact that the sump is connected by conduit to the turbine indicates that your client expects false starts to occur from time to time. Accordingly, EPA believes these sumps are not the same as emergency spill tanks which allow an appropriate immediate response to emergency situations which threaten immediate releases into the environment.

The above conclusion is further supported in the September 23, 1988 preamble discussion where on page 37109 it says "sumps designed to store petroleum or hazardous substances during periodic cleaning or maintenance of machinery or equipment are not included in this exclusion. An example of this type of sump is turbine oil sumps that are used during maintenance of electric power generation turbines. The act of occasionally draining out a false-starting turbine so that it can ignite is also considered by EPA to be a planned maintenance activity. It is not the type of unplanned-for-leak-threatening emergency situation that requires immediate and temporary storage in an emergency spill or overfill tank.

In sum, it is our conclusion that the false start sumps described in your letter are subject to the 40 CFR Part 280 requirements. Therefore, the views of the person named in your letter, Martha Zeichner, do not represent the position of EPA's Office of Underground Storage Tanks on the question of false-start sumps.

I hope the above sufficiently clarifies OUST's position on this matter for your needs.

Sincerely,

/s/

David W. Ziegele, Director
Office of Underground Storage Tanks

(os-410(WF) :DOBrien:bmt.lO/7/9l.DISC#c:hamula.ltr)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

November 19, 1992

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Ms. Jean Riley, Executive Director
Petroleum Tank Release Compensation Board
1740 N. Montana
Helena, Montana 59620

Dear Ms. Riley:

I am writing to confirm the conclusions we reached in our earlier telephone conversation regarding the definition of "farm tank" under subtitle I of the Resource Conservation and Recovery Act (RCRA), and the applicability of the farm-tank exclusion to the tank(s) located at the livestock exchange that you described.

A "farm tank" is defined in the federal underground storage tank (UST) regulations (40 CFR 280.12) as; "a tank located on a tract of land devoted to the production of crops or raising of animals, including fish, and associated residences and improvements. A farm tank must be located on the farm property. "Farm" includes fish hatcheries, rangeland and nurseries with growing operations." [emphasis added]

Although the preamble to the regulation does not deal specifically with livestock exchanges, it clearly excludes from the definition of farm tank retail stores and nursery centers where agricultural products are "marketed, but not produced." A similar situation exists with livestock exchanges where livestock is solely marketed, but not raised. Thus, the mere fact that a tank is somehow associated with agricultural operations does not, by itself, allow the tank to be defined as a “farm” tank for purposes of the farm-tank exclusion under subtitle I of RCRA.

The livestock exchange that you described in our conversation and your letter (attached) is evidently devoted to marketing rather that raising of animals, and is not located on a farm or rangeland. Therefore, it appears that a tank located at such a facility would not qualify for the farm-tank exclusion under the federal UST regulations. Unless it is exempted for some other reason that we are unaware of, it would be considered a regulated tank under Subtitle I of RCRA.

I hope this letter meets your needs and apologize for the delay in getting it to you. Please feel free to contact me at (703) 308-8881 if I can be of any further assistance.

Sincerely,

/s/

John M. Heffelfinger
Office of Underground Storage Tanks

Attachment

cc: UST Regional Program Managers
Dick Blodnick

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

June 4, 1993

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Robert C. Galbraith
Assistant Attorney General
General Counsel, UST Fund Board
Iowa Department of Justice
Hoover Building
Des Moines, Iowa 50319

Dear Mr. Galbraith:

I am writing in response to your letter dated May 27, 1993, in which you asked whether the U.S. Environmental Protection Agency (EPA) currently requires underground storage tanks (USTs) containing pure toluene to maintain proof of financial responsibility. As discussed below, under the federal regulatory program for USTs, EPA does <u>not</u> currently require owners and operators of USTs containing pure toluene to maintain evidence of financial responsibility for taking corrective action or compensating third parties for releases from those USTs.

EPA's authority for regulating USTs is found in subtitle I of the Resource Conservation and Recovery Act. Under Subtitle I, EPA has promulgated final financial responsibility regulations for owners and operators of petroleum underground storage tanks only. See 40 CFR Part 280.90 through 280.l12, enclosed. USTs containing "hazardous substances" (as opposed to petroleum) are not subject to the financial responsibility regulations, by virtue of their absence from Part 280.90 -- Applicability.

For regulatory purposes under subtitle I, an UST storing pure toluene is considered to be a."hazardous substance UST system," which EPA defines in the comprehensive federal UST regulations in Part 280.12 as follows:

> "Hazardous substance UST system" means an underground storage tank system that contains a hazardous substance defined in section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) ... or any mixture of such substances and petroleum, and which is not a petroleum UST system.

Toluene is a hazardous substance as defined under section 101(14) of CERCLA. It is listed in 40 CFR Part 302, Table 302.4 -- List of Hazardous Substances and Reportable Quantities. I have enclosed the relevant pages from that list.

EPA issued an Advanced Notice of Proposed Rulemaking on financial responsibility requirements for USTs containing hazardous substances in the Federal Register on February 9, 1988 (see 53 FR 3818). Thus, while EPA has the statutory authority to require financial responsibility for hazardous substance USTs such as those containing toluene, EPA has not yet formally proposed nor finalized such a rule.

I hope the information I have provided satisfies your request. Please contact me if I can be of any further assistance.

Sincerely,

/s/

John M. Heffelfinger
Special Assistant to the Director
Office of Underground Storage Tanks

Enclosures

cc: Lee Daniels, U.S. EPA, Region 7

(seal)

STATE OF MISSISSIPPI

DEPARTMENT 0F ENVIRONMENTAL QUALITY

JAMES I. PALMER JR.
EXECUTIVE DIRECTOR

January 8, 1993

Mr. John K. Mason
Environmental Protection Agency
345 Courtland St. NE
Atlanta, GA 30365

Dear Mr. Mason

RE: Defining "Annual" for Release Detection

Our office requests that the term "annual" be defined since there seems to be some discrepancy as to the interpretation of this term when a tank owner is evaluated for compliance with the release detection method of annual precision tank tightness testing in combination with inventory control and reconciliation.

Our understanding of this definition is that "annual" is a period of twelve months. So, if a tank owner chooses to precision test on February 1 of the phase-in year required for release detection, the tank owner must test the tanks again by February 1 of the following year in order to satisfy the requirements of "annual" precision tank tightness testing.

However, one tank owner believes that as 1ong as a facility is tested each year by the phase-in period of December 22, he is in compliance with "annual" precision testing, since the tanks are tested each calendar year by the phase-in deadline of December 22. We believe that this interpretation is incorrect, and two analogies for our reasoning are as follows:

1. If this interpretation is correct, a tank owner could theoretically test the tanks on December 22 of one year, test them on January 1 of the following year, and December 22 of the following year. Thus, only 10 days would elapse from one "annual" testing and over 24 months would elapse from the next "annual" testing. We believe that the regulations were not written so that precision tank tightness testing would occur at such extreme time intervals to satisfy release detection requirements.

2. If “monthly” monitoring is interpreted as “every thirty days”, then “annual” must either mean “every twelve months” or “every 365 days”.

Please submit clarification on the definition of “annual” so that we can properly determine the compliance status of facilities that use annual precision testing in conjunction with inventory control and reconciliation as a release detection method. For your information we have included a copy of the tank owner’s response. We would appreciate an answer by January 29, 1993 so that we can expedite our release detection compliance efforts.

Thank you for your attention into this matter.

/s/

Walter Huff, P.E.
Mississippi UST Technical Coordinator

Enclosure
WJ:dj

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

March 7, 1993

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Regulatory Interpretation;
Definition of "Annual" As It Applies to Tightness Tests

FROM: David W. Ziegele, Director, /s/
Office of Underground storage Tanks

TO: UST/LUST Regional Program Managers

This is to respond to a request from Region IV for clarification of the definition of "annual" as it pertains to tank and line tightness testing.

280.41(a)(2) states “UST systems that do not meet the performance standards in § 280.20 or § 280.21 may use monthly inventory controls ... and annual tank tightness testing until December 22, 1998 ...” Similarly, 280.41(b)(1)(ii) requires that pressurized piping “have an annual line tightness test conducted in accordance with § 280.44(b) or have monthly monitoring conducted...”

Annual" as used in these two cites means on or before the same date of the following year. Other interpretations cannot be supported by the letter or intent of the regulations. Note that, per 280.40(c), “... all UST systems must comply with the re1ease detection requirements of this subpart by December 22 of the year listed ...” Therefore, for compliance, a tightness test must first be conducted within the annual time period before the compliance date, and again on or before the test date the year following the test.

For example, if a tank was due for leak detection by December 22, 1990 and was tested back on January 1, 1990, it was in compliance on its deadline, but had to be retested by January 1, 1991, only a few days thereafter.

Similarly, the phrase “every 5 years” means on or before the same date five years later, as the phrase is used in 280.41(a)(1). This cite reads “UST systems that meet the performance standards in § 280.20 or § 280.21, and the monthly inventory requirements ... may use tank tightness testing ... at least every 5 years until December 22, 1998, or until 10 years after the tank is installed or upgraded ... whichever is later.”

As you know, States may have imposed more stringent requirements than EPA’s, and before

State Program Approval both sets of requirements would be in effect. If you have any questions on leak detection, please contact David Wiley of my staff at (703)308-8877.

cc: UST/LUST Regional Branch Chiefs
OUST Management Team
Shonee Clark, OUST (compendium)
Dawn Messier, OGC
Mimi Newton, OE
Barbara Simcoe, ASTSWMO
David Wiley, OUST

Regulatory Interpretation: Definition of "Annual" With Regards to Tightness Testing

Background

280.41(a)(2) states "UST systems that do not meet the performance standards in § 280.20 or § 280.21 may use monthly inventory controls ... and annual tank tightness testing until December 22, l998 when the tank must be upgraded under § 280.21 or permanently closed under § 280.71..." Similarly, 280.41(b)(l)(ii) requires that pressurized piping "have an annual line tightness test conducted in accordance with § 280.44(b) or have monthly monitoring conducted ..."

Similarly, 280.41(a)(l) reads, "UST systems that meet the performance standards in § 280.20 or § 280.21, and the monthly inventory requirements ... may use tank tightness testing ... at least every 5 years until December 22, 1998, or until 10 years after the tank is installed or upgraded ..., whichever is later."

Note that, per 280.40(c), "... all UST systems must comply with the release detection requirements of this subpart by December 22 of the year listed ..."

Mississippi requested clarification from Region IV with regards to an enforcement action: Region IV requested clarification from HQ OUST.

Discussion

Given that leak detection, including tightness testing, must be provided by the applicable compliance date, there are three possible interpretations of the annual requirement:

1) On or before the same date of the following year;

2) same as 1), except tanks in compliance with the first compliance date have one full year from that compliance data to retest; or

3) anytime during the following year, measured either by the calendar, by the December 22 schedule for phase-in, or by the last test date.

The first interpretation above is consistent with the regulations and their intent. For example, if a tank was due to provide leak detection by December 22, 1990 and was tested on January 1, 1990, it had to be retested by January 1, 1991, only a few days after its deadline. Under 2) or 3) above, this same tank could go until December 22 or December 31 of 1991 almost two years since the last test.

The same logic also applies to the phrase "every 5 years," as applied to tightness testing on new and upgraded tanks. "Every 5 years" means on or before the same date five years later.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MARCH 9, 1995

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Regulatory Interpretation:
Tank Lining Inspection Frequency Requirement

FROM: Lisa C. Lund, Acting Director /s/
Office of Underground Storage Tanks

TO: Patricia Tan, Chief
Underground Storage Tank Section (3HW63)
Region 3

This memorandum responds to an inquiry from the Virginia Department of Environmental Quality (VDEQ; copy attached) requesting clarification of the initiation date for the 10-year inspection and subsequent 5-year inspections of an underground storage tank (UST) properly lined before the December 22, 1988 effective date of the UST technical regulations. Specifically, VDEQ asked whether the 10-year period referenced at 40 CFR 280.21 (b)(1)(ii) begins when the tank was first properly lined or on the effective date of the regulations.

An existing UST owner/operator may comply with 40 CFR 280.21's upgrading requirements (which must take place no later than December 22, 1998) using the interior lining option (combined with the piping and spill and overfill upgrade requirements) if " **<u>within 10 years after lining</u>, and every 5 years thereafter, the lined tank is internally inspected and found to be structurally sound with the lining still performing in accordance with original design specifications**" (40 CFR 280.21 (b)(1)(ii) with emphasis added). By use of the words "after lining," the regulations clearly require that in order to be considered properly upgraded all such tanks, whether lined prior to or following the effective date of the regulations, must be inspected within the initial 10-year period after lining, followed by subsequent inspections at 5-year intervals. A lining which is not inspected in accordance with these requirements will not meet the requirements for upgrading existing systems.

For example, a tank properly lined in accordance with an existing industry standard or code of practice (such as API 1631 or NLPA 631) in May 1985, will require inspection on or before the same date of May 1995. Within five years of the initial 10-year inspection, the next inspection is due, followed by subsequent inspections within five years of each previous inspection. This upgrade may be used in conjunction with piping, spill and overfill upgrade requirements as long as the internal lining inspections indicate that the lining continues to perform in accordance with original design specifications.

According to the preamble of 40 CFR 280, interior lining, when used as the sole method of corrosion protection, is not considered a permanent upgrade. However, it is adequate as long as the lining continues to meet original design specifications as determined by periodic inspections. Therefore, it is technically necessary to inspect the lining according to the previously mentioned timetable regardless of whether the tank was lined before or after December 22, 1988. This technical position is consistent with NLPA Standard 631 (Entry, Cleaning, Interior Inspection, Repair, and Lining of Underground Storage Tanks), which requires an initial inspection within 10 years of tank lining followed by subsequent inspections not exceeding every 5 years.

If there are additional questions, please call Paul Miller of my staff at (703) 308-7242.

Attachment

cc: ASTSWMO UST Task Force
OUST Management Team
UST/LUST Regional Program Managers
Frank Ciaviattieri, Region 1
Conrad Simon, Region 2
Robert Greaves, Region 3
Mary Kay Lynch, Region 4
Norman Niedergang, Region 5
Guanita Reiter, Region 6
Lynn Harrington, Region 7
Robert L. Duprey, Region 8
Laura Yoshii, Region 9
Ken Feigner, Region 10
Dawn Messier, OGC
Tony Rieck, National Leak Prevention Association
Joan Olmstead, OECA
Shonee Clark, OUST (Compendium)
Paul Miller, OUST

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

March 31, 2011

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Update to the Regulatory Interpretation Request:
Clarification of "Corrosion Expert" and "Cathodic Protection Tester"

FROM: Carolyn Hoskinson, Director
Office of Underground Storage Tanks

TO: EPA UST/LUST Regional Program Managers
State UST Managers

This memorandum updates the Office of Underground Storage Tank's (OUST) April 16, 2001 memorandum titled ***Update to the Regulatory Interpretation Request: Clarification of "Corrosion Expert" and "Cathodic Protection Tester."*** Since OUST issued that memorandum, NACE International changed their certification categories. In particular, they added a new certification category, cathodic protection technologist.

The Environmental Protection Agency (EPA) believes the new certification category fits EPA's definition of cathodic protection tester (§ 280.12) but does not meet EPA's definition of corrosion expert (§ 280.12). We believe cathodic protection technologist does not meet the definition of corrosion expert because the skill assessment description contained in the NACE International literature requires only the design and installation of simplistic forms of galvanic and impressed current cathodic protection facilities. EPA believes cathodic protection systems at underground storage tank (UST) facilities can be complex and therefore, to be considered a corrosion expert, certifications must include skills to design complex cathodic protection systems. The attached table lists the NACE International certifications and shows where each certification fits into EPA's corrosion expert and cathodic protection tester definitions. This table updates the table provided in the April 16, 2001 memorandum which is available on EPA's website at: www.epa.gov/oust/compend/adn.htm (question 30).

As always, state agencies may impose requirements that are more stringent than the federal regulation. Owners and operators of UST facilities and members of the contracting community should confer with their state UST program offices to determine whether they interpret corrosion expert and cathodic protection tester definitions differently.

If you have any questions on this issue, please contact Paul Miller (703-603-7165 or miller.paul@epa.gov) of my staff. For information on NACE International's accreditation programs and descriptions of each certification category, please contact NACE International at (281) 228-6200 or visit their website at: www.nace.org.

Attachment

cc: Kim Ray, NACE International
Kathy Nam, OGC
OUST Regional Liaisons

Attachment: NACE International Certification Levels That Meet EPA's Definitions Of Corrosion Expert And Cathodic Protection Tester

EPA Definition (40 CFR Part 280.12)	*NACE Certification*
CORROSION EXPERT EPA's definition requires NACE certification unless the person is a registered professional engineer (PE) with certification or licensing that includes education and experience in corrosion control of buried or submerged metal piping systems and metal tanks. **Please check with state and local authorities to determine if their requirements are more stringent.**	Corrosion Specialist
	Cathodic Protection Specialist
CATHODIC PROTECTION TESTER EPA's definition of cathodic protection tester does not require any specific certification; however, it does require education and experience in various corrosion areas. Persons holding these NACE certification levels are viewed by EPA as fully meeting regulatory requirements. **Please check with state and local authorities to determine if their requirements are more stringent.** Note: Persons meeting EPA's definition of corrosion expert would also be considered as meeting EPA's definition of cathodic protection tester.	Cathodic Protection Technologist
	Cathodic Protection Technician
	Cathodic Protection Tester
	Senior Corrosion Technologist
	Corrosion Technologist
	Corrosion Technician*

*Please note that NACE requires a *Corrosion Technician* performing as a CATHODIC PROTECTION TESTER be directly supervised by a *Corrosion Technologist, Senior Corrosion Technologist, Cathodic Protection Specialist,* or *Corrosion Specialist.*

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

4/16/2001

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Update to the Regulatory Interpretation Request:
Clarification of "Corrosion Expert" and "Cathodic Protection Tester"

FROM: Cliff Rothenstein, Director /s/
Office of Underground Storage Tanks

TO: EPA UST/LUST Regional Program Managers
State UST Managers

This memorandum provides an update to the memorandum titled ***Regulatory Interpretation Request: Clarification of "Corrosion Expert" and "Cathodic Protection Tester"*** dated September 24, 1994. Since the original memorandum was issued, NACE International has made changes to their certification categories. In particular, they have added two new categories, cathodic protection tester and cathodic protection technician, and have changed some of the requirements for cathodic protection specialist. EPA believes that both of the new certification categories fit under the definition of cathodic protection tester. However, we believe that neither of the new certifications meets EPA's definition of corrosion expert. Attached is an update to the table provided in the September 24, 1994 memorandum. This table describes the various NACE International certifications and shows how each certification fits into EPA's corrosion expert and cathodic protection tester definitions and supercedes the table provided in the September 24, 1994 memorandum.

As always, state agencies may impose requirements that are more stringent than the federal regulations. Owners and operators of UST facilities and members of the contracting community should confer with their state UST program offices to determine whether they interpret corrosion expert and cathodic protection tester definitions differently.

If you have any questions on this issue, please contact Paul Miller of my staff by phone at (703) 603-7165 or by email at miller.paul@epa.gov. For information on NACE International's accreditation programs, please contact NACE International at (281) 228-6200 or visit their website at www.nace.org.

Attachment

cc: Cliff Johnson, NACE International
Kathy Nam, OGC
OUST Desk Officers

ATTACHMENT: NACE CERTIFICATION LEVELS THAT MEET EPA'S DEFINITIONS OF CORROSION EXPERT AND CATHODIC PROTECTION TESTER

EPA Definition (40 CFR §280.12)	*NACE Certification*	*Expertise/qualifications in corrosion control of USTs*
CORROSION EXPERT (The EPA definition requires NACE certification unless the person is a registered PE with certification or licensing that includes education and experience in corrosion control of buried or submerged metal piping systems and metal tanks. **Please check with state and local authorities to determine if their requirements are more stringent.**)	Corrosion Specialist	• Cathodic protection (includes all areas of expertise under Cathodic Protection Specialist) • Coatings and linings • Metallurgy • Plastics (non-metallic materials) • Inhibitors (environmental treatment) • Corrosion assessment • Stray current or cathodic interference testing and analysis • Corrosion site surveys • Corrosion control designs and recommendations • Work/education experience is the same as for Cathodic Protection Specialist plus a Specialty Area Certification.

	Level 3 - Cathodic Protection (CP) Specialist	• System design and specifications
		• Installation supervision
		• System testing/commissioning
		• Stray current/cathodic interference testing and analysis
		• System maintenance
		• Cathodic protection assessment
		• Cathodic protection recommendations
		• Analysis of cathodic protection feasibility
		• Cathodic protection installation permits/licenses
		• 4 years CP work experience in responsible charge plus CP level 2 certification or equivalent training plus one of the following:
		  • 8 additional years CP work experience plus 2 years post-high school training in math or science from an approved technical/trade school
		  • 2 additional years CP work experience plus 4-year engineering or physical science degree
		  • Engineer-in-training (EIT) registration or equivalent.
		  • Professional engineer (PE or P. Eng) or equivalent registration.
		  • Bachelor's degree in engineering or physical sciences and an advanced degree in engineering or physical science that required a qualification exam.

Continued on the next page

<table>
<tr><th>EPA Definition (40 CFR §280.12)</th><th>NACE Certification</th><th>Expertise/qualifications in corrosion control of USTs</th></tr>
<tr><td rowspan="2">CATHODIC PROTECTION TESTER

(The EPA definition of cathodic protection tester does not require any certification; however, persons holding these NACE certification levels are viewed by EPA as fully meeting regulatory requirements. Please check with state and local authorities to determine if their requirements are more stringent.)</td><td>Level 2 - Cathodic Protection Technician</td><td>• Perform advanced field tests and evaluate the results
• Verify stray current interference
• Understand AC voltage and its mitigation
• Maintain advanced documentation and records, including data plotting
• Conduct and understand the importance of periodical surveys, including IR Free readings and polarization decay tests
• Install, repair, modify and test rectifiers and component parts such as circuits
• Collect data on ER probes
• 3 years CP work experience plus high school diploma or GED plus CP level 1 certification or equivalent training
–or–
1 year CP work experience plus 4-year physical science or engineering degree plus CP level 1 certification or equivalent training
–or–
2 years CP work experience plus 2-year post high school training from an approved math or science technical/trade school plus CP level 1 certification or equivalent training</td></tr>
<tr><td>Level 1 - Cathodic Protection Tester</td><td>• Perform atmospheric corrosion inspections
• Understand the basics of corrosion and cathodic protection theory
• Conduct insulator tests and identify shorts in CP systems
• Use test instruments to perform a variety of field tests and take rectifier readings
• Install galvanic anodes and test
• Read shunts and understand their use in rectifiers, bonds, and anodes
• Perform the periodic surveys such as structure to soil, soil resistivity, coupon tests, offshore platform and riser surveys, rectifier readings, and surveys of bonds and diodes
• Knowledge of reference cells and their installation, testing and safety requirements
• Basic location mapping, report preparation and record keeping
• 6 months cathodic protection work experience plus high school diploma or GED</td></tr>
</table>

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<table>
<tr><th>EPA Definition (40 CFR §280.12)</th><th>NACE Certification</th><th>Expertise/qualifications in corrosion control of USTs</th></tr>
<tr><td rowspan="3">CATHODIC PROTECTION TESTER (continued)

(The EPA definition of cathodic protection tester does not require any certification; however, persons holding these NACE certification levels are viewed by EPA as fully meeting regulatory requirements. Please check with state and local authorities to determine if their requirements are more stringent.)</td><td>Senior Corrosion Technologist</td><td>• Installation supervision
• System testing and commissioning
• System maintenance
• Evaluation of system performance
• Eight years corrosion work experience, including four years in responsible charge,
–or–
Bachelor's degree in physical sciences or engineering plus four years corrosion work experience in responsible charge.</td></tr>
<tr><td>Corrosion Technologist</td><td>• Installation supervision
• System testing
• System maintenance
• Installation work
• Routine inspections
• Preliminary data analysis
• Minimum of four years corrosion work experience</td></tr>
<tr><td>Corrosion Technician*</td><td>• Routine system testing
• System maintenance
• Routine inspections
• Installation work
• Minimum of two years corrosion work experience</td></tr>
</table>

*Please note that NACE requires a *Corrosion Technician* performing as a CATHODIC PROTECTION TESTER be directly supervised by a *Corrosion Technologist, Senior Corrosion Technologist, Cathodic Protection Specialist,* or *Corrosion Specialist.*

Note: NACE International Certification requires a combination of fulfillment of formal education and work experience requirements as well as successfully passing a certification examination pertinent to the category of certification. All applicants must provide documented proof of acceptable work experience in the field of corrosion causes and mechanisms.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

September 27, 1994

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Regulatory Interpretation Request:
Clarification of "Corrosion Expert" and "Cathodic Protection Tester"

FROM: Lisa Lund, Acting Director /s/
Office of Underground Storage Tanks

TO: State UST Managers
UST/LUST Regional Program Managers
UST/LUST Regional Counsels

This memorandum has been prepared in response to requests we have received to offer further guidance on the qualifications of "Corrosion Expert" and "Cathodic Protection Tester" as they are set forth in 40 CFR §280.12. As the 1998 deadline approaches, State and Regional staff have become increasingly concerned that underqualified persons may be taking part in the installation and testing of cathodic protection equipment for underground storage tanks (USTs). This concern has recently been echoed by NACE International (appended without attachment), a nationally recognized organization that specializes in corrosion control.

A Corrosion Expert, as defined in the regulations, must demonstrate the education and training needed to qualify in the practice of corrosion control on buried metal piping systems and tanks. Proof of qualification under 40 CFR §280.12 can take one of two forms: (1) a person must be a registered professional engineer with certification or licensing that includes education and experience in corrosion control of buried or submerged metal piping systems and tanks, or (2) "a person must be accredited or certified as being qualified by the National Association of Corrosion Engineers" [now known as NACE International].

There has been some confusion associated with the latter. Regulators and the regulated community are generally unfamiliar with which NACE certification levels are appropriate and adequate for work related to USTs. NACE International has responded by providing clarification. NACE recognizes only persons certified as either *Corrosion Specialists* or *Cathodic Protection Specialists* as being qualified on the basis of training and work experience to engage in the practice of corrosion control on buried or submerged metal piping systems and metal tanks. The attached table highlights the areas of expertise, education, and training commanded by each level of NACE certification. Any person who is certified as either fulfills the regulatory requirements for Corrosion Expert. Verification of the certification level of any individual can be obtained from NACE International.

Unlike Corrosion Expert, being a professional engineer or holding NACE certification is not a requirement under the regulations for a Cathodic Protection Tester. There are several levels of NACE certification, however, that meet the minimum requirements for Cathodic Protection Tester education and experience set out in 40 CFR §280.12. Specifically, any person who has been NACE certified as a *Senior Corrosion Technologist* or *Corrosion Technologist* is recognized by OUST as demonstrating an understanding of the principles and measurements of all common types of cathodic protection systems as applied to buried or submerged metal piping and tank systems. In addition, a person who has been NACE certified as a *Corrosion Technician* can serve as a Cathodic Protection Tester, with the stipulation that the technician perform system testing under the direct oversight of a Corrosion Specialist, Cathodic Protection Specialist, Senior Corrosion Technologist, or Corrosion Technologist, as required by NACE. The three NACE certification levels are detailed in the accompanying table.

As always, states are at liberty to impose requirements more stringent than the federal regulations. Owners and operators of UST facilities and members of the contracting community should confer with their state UST program offices to determine whether there are any differences between the state and federal regulations.

If you have any questions on this issue, please contact Bill Faggart of my staff at (703) 308-8897. For information on NACE International′s accreditation programs, please contact NACE International at (713) 492-0535.

Attachments (2)

cc: Kevin C. Garrity, NACE International
Shelley Nadel, NACE International
UST/LUST Regional Branch Chiefs
OUST Management Team
Shonee Clark, OUST (Compendium)
Dawn Messier, OGC
Joan Olmstead, OECA/RCRA
Barbara Simcoe, ASTSWMO

Bill Faggart, OUST
David Wiley, OUST
Randy Nelson, Region VII

CERTIFICATION LEVELS FOR UST CORROSION PROTECTION

<table>
<tr><th>EPA Definition
(40 CFR §280.12)</th><th>NACE Certification</th><th>Expertise/qualifications in corrosion control of USTs</th></tr>
<tr><td rowspan="2">CORROSION EXPERT

(NACE certification is required unless person is a registered PE with certification or licensing in corrosion control of buried metal pipes and tanks.)</td><td>Corrosion Specialist</td><td>• Cathodic protection (includes all areas of expertise under Cathodic Protection Specialist)
• Coatings and linings
• Metallurgy
• Plastics (non-metallic materials)
• Inhibitors (environmental treatment)
• Corrosion assessment
• Stray current or cathodic interference testing and analysis
• Corrosion site surveys
• Corrosion control designs and recommendations
• Work/education experience is the same as for Cathodic Protection Specialist plus a Specialty Area Certification.</td></tr>
<tr><td>Cathodic Protection Specialist</td><td>• System design and specifications
• Installation supervision
• System testing/commissioning
• Stray current/cathodic interference testing and analysis
• System maintenance
• Cathodic protection assessment
• Cathodic protection recommendations
• Analysis of cathodic protection feasibility
• Cathodic protection installation permits/licenses
• Eight years corrosion work experience, including four years in responsible charge plus Senior Corrosion Technologist Exam
–or–
Four years corrosion work experience in responsible charge plus one of the following:
• Engineer-in-Training (EIT) registration or equivalent.
• Professional Engineer (PE or P. Eng) or equivalent registration.
• Bachelor’s degree in Engineering or Physical Sciences plus a Ph.D. in Engineering or Physical Sciences that required a qualifications exam.</td></tr>
</table>

(continued)

EPA Definition (40 CFR §280.12)	*NACE Certification*	*Expertise/qualifications in corrosion control of USTs*
CATHODIC PROTECTION TESTER	Senior Corrosion Technologist	• Installation supervision • System testing and commissioning • System maintenance • Evaluation of system performance • Eight years corrosion work experience, including four years in responsible charge, –or– Bachelor's degree in Physical Sciences or Engineering plus four years corrosion work experience in responsible charge.
(NACE certification is *not* required; however, persons holding these NACE certification levels are viewed by OUST as fully meeting regulatory requirements.)	Corrosion Technologist	• Installation supervision • System testing • System maintenance • Installation work • Routine inspections • Preliminary data analysis • Minimum of four years corrosion work experience
	Corrosion Technician *	• Routine system testing • System maintenance • Routine inspections • Installation work • Minimum of two years corrosion work experience

*NACE requires that a *Corrosion Technician* performing as a CATHODIC PROTECTION TESTER must be directly supervised by a *Corrosion Technologist, Senior Corrosion Technologist, Cathodic Protection Specialist,* or *Corrosion Specialist.*

Note: NACE International Certification requires a combination of fulfillment of formal education and work experience requirements as well as successfully passing a certification examination pertinent to the category of certification. All applicants must provide documented proof of acceptable work experience in the field of corrosion causes and mechanisms.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

February 24, 1997

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Memorandum

SUBJECT: Regulatory Interpretation on the Applicability of Subtitle I of the Resource Conservation and Recovery Act to Regulate Water Covered Storage Tanks

FROM: Anna Hopkins Virbick, Acting Director /s/
Office of Underground Storage Tanks

TO: John K. Mason, Chief
Underground Storage Tank Section, Region 4

This memorandum is in response to your request for a regulatory interpretation concerning the applicability of Subtitle I of RCRA to certain water covered tanks containing carbon disulfide. As you are aware, we have considered four possible interpretations. We have circulated these possible interpretations to all EPA UST Regional Program Managers and to the Office of General Counsel.

After fully considering all possible interpretations and the comments we received from EPA Regional Offices and the Office of General Counsel, we have concluded that the tanks in question are not regulated because they are not underground and do not meet the definition of an underground storage tank. Both the statute and EPA's regulations (40 CFR 280.12) define the term "underground storage tank" to mean: "any one or a combination of tanks (including underground pipes connected thereto) that is used to contain an accumulation of regulated substances, and the volume of which (including the volume of the underground pipes connected thereto) is 10 percent or more beneath the surface of the ground." (emphasis added)

The term "underground" is not defined in the law or in the regulations. The term, "beneath the surface of the ground," however, is defined at 40 CFR 280.12 to mean: "beneath the ground surface or otherwise covered with earthen materials." The tanks in question are below grade but are not "beneath the ground surface or otherwise covered with earthen materials." The tanks are covered with water which is not an earthen material. Therefore, the tanks are not "beneath the surface of the ground" and are not regulated.

A brief review of the way the Agency has considered below grade tanks to be regulated further confirms the conclusion that the tanks in question are not regulated. On April 7, 1986, the Agency issued a guidance document that indicated that tanks which were 10 percent or more below grade were regulated even if not covered by ground material. The April 1986 guidance would have the tanks in question regulated under Subtitle I of RCRA.

The 1987 proposed rule, however, changed the treatment of below grade tanks such as the tanks in question. The April 17, 1987 proposed rule states in 40 CFR 280.12 that beneath the surface of the ground "means beneath the ground surface or otherwise covered with materials so that physical inspection is precluded." The preamble to the proposed rules (p. 12690) explains that this means that: "A tank whose volume is less than 10 percent beneath the surface of the ground and that is below grade but not covered with ground material, such as a tank in a ditch or natural depression, is not included in today's proposal because it is not substantially different from an above ground tank." Thus, the proposed rules changed the April 1986 guidance by removing tanks from Subtitle I jurisdiction that are below grade, not covered with ground materials and whose volume is less than 10 percent beneath the surface of the ground. Tanks covered with water are not considered to be covered with ground materials and, therefore, would not be regulated.

While the language in the proposed rules leads to the conclusion that the tanks in question are not regulated, changes found in the final rule make this explicitly clear. The final regulation in 40 CFR 280.12 changed the definition of "beneath the surface of the ground" in two ways. First, it added the word "earthen" to the phrase "or otherwise covered by materials" to read "or otherwise covered by earthen materials." Second, it dropped the phrase "so that physical inspection is precluded" at the end of the definition. Thus, it is clear in the final rule that below grade tanks not covered by earthen material are not regulated, even if physical inspection is precluded because the tanks are covered by a non-earthen material. The water, in this case, does not preclude physical inspection. Even if it did, however, the regulations would not apply to the tanks in question.

As mentioned above, we have discussed this issue with staff in the Office of General Counsel who concurs with our interpretation. If you have any questions or would like to discuss this issue further, please call John Heffelf inger (703 603-7157) or Bill Lienesch (703 603-7162).

cc: UST/LUST Regional Program Managers
Katherine Nam, Office of General Counsel
OUST Program Directions Team
OUST Desk Officers

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEPTEMBER 20, 1999

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Ms. Dorcee Lauen
Williams & Company/PSTIF
P.O. Box 8100
Sioux City, IA 51102-8100

Dear Ms. Lauen:

Thank you for your electronic mail message dated July 7, 1999, to Paul Miller of my staff regarding the 3-year cathodic protection testing requirement for cathodically protected underground storage tanks (USTs). In your message, you asked the Office of Underground Storage Tanks (OUST) to clarify the term “every 3 years” with regards to the cathodic protection testing requirement in the federal regulations. The regulations at 40 CFR 280.31(b)(1) state that:

> “All cathodic protection systems must be tested within 6 months of installation and at least every 3 years thereafter or according to another reasonable time frame established by the implementing agency.”

OUST interprets this statement to mean that a cathodic protection test must be conducted on or before the same day of the third year after the previous cathodic protection test has occurred. Please note that the Federal regulations allow implementing agencies to establish another reasonable time frame.

Please contact Paul Miller of my staff via e-mail at miller.paul@epa.gov, via phone at 703/603-7165, or via FAX at 703/603-9163 if you have further questions.

Sincerely,

/s/

Sammy Ng, Acting Director
Office of Underground Storage Tanks

cc: State UST Program Managers
EPA Regional Program Managers
Wayne Geyer, Steel Tank Institute
Kathy Nam, OGC
Shonee Clark (compendium)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 27 2007

OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Regulatory Interpretation;
Regulatory Status of E85 Tanks

FROM: Cliff Rothenstein, Director
Office of Underground Storage Tanks

TO: EPA UST/LUST Regional Program Managers
State UST Program Managers

This memorandum responds to questions from states on the regulatory status of underground storage tanks (USTs) containing E85. E85 is a blend of approximately 85% ethanol and 15% gasoline, though the actual percentage may vary due to different blending techniques and seasonal blends.

An underground storage tank is defined, in part, as, "any one or combination of tanks (including underground pipes connected thereto) that is used to contain an accumulation of regulated substances." Pure ethanol is not a regulated substance; however, gasoline is a petroleum product, and petroleum is a regulated substance. An UST storing E85 is thus storing an accumulation of regulated substances and is a regulated UST subject to 40 CFR Part 280 unless it meets one of the exclusions in §280.10(b) or exemptions in the definition of UST in §280.12.

One common exclusion is for a small-capacity UST system defined as, "[a]ny UST system whose capacity is 110 gallons or less" (§280.10(b)(4)). This exclusion refers to total tank capacity and was chosen primarily to reduce the regulatory burden on implementing agencies. An UST system storing E85 would be excluded by §280.10(b)(4) only if the total capacity of the UST system were 110 gallons or less.

Another common exclusion addresses "[a]ny UST system that contains a *de minimis* concentration of regulated substances" (§280.10(b)(5)). Examples given in the preamble to the regulation include substances with very small concentrations, such as chlorine in drinking water and swimming pools (generally a few parts per million) (53 Fed. Reg. 37108 - 37109 (1988)). The petroleum fraction in E85 is orders of magnitude greater than the examples of *de minimis* concentrations referenced in the preamble. Therefore, an UST storing E85 contains more than a *de minimis* concentration of petroleum and does not qualify for the *de minimis* exclusion. Implementing agencies should use the examples given in the preamble as a guide to determine whether USTs storing other fuel blends qualify for the *de minimis* concentration exclusion.

If you have any questions about this clarification or any other issues relating to regulation of UST systems storing alternative fuels, please contact Andrea Barbery at barbery.andrea@epa.gov or 703/603-7137.

cc: Susan Bodine, OSWER
Barry Breen, OSWER
Scott Sherman, OSWER
Regional UST Branch Chiefs
OUST Management
Mary Kay Lynch, OGC
Earl Salo, OGC
Kathy Nam, OGC
Brigid Lowery, OSWER
Ellyn Fine, OSWER
Sherri Clark, OSWER
OUST Regional Liaisons

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

September 22, 2009

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Regulatory Status of Underground Diesel Exhaust Fluid Tanks

FROM: Carolyn Hoskinson, Director
Office of Underground Storage Tanks

C Hoskinson

TO: EPA UST/LUST Regional Program Managers
State UST Program Managers

This memorandum responds to questions from states on the regulatory status of underground storage tanks (USTs) containing diesel exhaust fluid (DEF). Specifically, states have asked whether EPA regulates USTs containing DEF under the federal UST regulations in 40 CFR Part 280. According to these regulations, an UST is regulated if it contains petroleum or hazardous substances; however, a number of UST systems are excluded from the Part 280 requirements. One of the exclusions applies to "[a]ny UST system that contains a *de minimis* concentration of regulated substances" (§280.10(b)(5)). The regulations do not specify a *de minimis* quantity, but do allow the implementing agency to determine *de minimis* concentrations on a case-by-case basis.

DEF is a 32.5 percent aqueous solution of urea used in Selective Catalytic Reduction (SCR) technology as one way to reduce nitrogen oxide emissions from heavy-duty diesel engines, as required by EPA's "2007 Heavy-Duty Highway Rule." Although aqueous urea is neither petroleum nor a hazardous substance, the DEF solution may contain a small amount of ammonia, which is a regulated substance. According to DEF manufacturers, any amount of ammonia present in DEF is considered to be a contaminant. To address this contamination concern, the industry has set a very strict limit on the maximum amount of ammonia allowed in solution. The international standard for DEF allows no more than 0.2 percent by weight of alkalinity, measured as ammonia, to be present in solution. Although 0.2 percent is the maximum allowed limit according to the international standard, manufacturers indicate that the actual amount of ammonia in solution should be much less than 0.2 percent, and ideally there should be no ammonia in solution. Since EPA expects that the presence of ammonia in a DEF UST will be minimal, it is EPA's view that DEF USTs meet the *de minimis* exclusion and thus are not regulated as hazardous substance USTs under the federal UST regulations.

In addition, EPA expects USTs storing DEF will be both compatible and secondarily contained. International standards for DEF set strict requirements for compatibility in order to avoid product contamination caused by materials in the storage tank system degrading into the DEF and also to prevent releases due to corrosion. Further, manufacturers recommend that underground DEF tank systems use secondary containment technologies with interstitial monitoring. EPA expects that owners and operators of DEF USTs will generally follow these industry, manufacturer, and international standards for the storage of DEF in USTs.

If in the future EPA finds that ammonia released from DEF USTs endangers human health and the environment, EPA may revisit the *de minimis* exclusion analysis contained in this memorandum. It is important to note that some states may choose to be more stringent than federal regulations and require DEF USTs to fully comply with state UST regulations.

If you have any questions about this interpretation, please contact Andrea Barbery at barbery.andrea@epa.gov or 703/603-7137.

cc: OUST Management
OUST Regional Liaisons
Kathy Nam, OGC

New/Upgraded UST Systems References

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460
Mail Code 5401G

APR 6 1989

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. Mike Nolan
Executive Vice President
Total Containment, Inc.
15 East Uwchlan
Exton, PA 19341

Dear Mr. Nolan:

This is in response to your communications with Dave O'Brien and Tom Schruben of my staff about your company's Total Containment Tank. You asked if this tank meets with EPA's final performance standards for new underground storage tanks provided in 40 CFR Part 280.20. It does.

This relatively new type of tank system uses a U.L. 58 steel tank shell and is surrounded by a secondary containment jacket that last fall passed the tests required by the Underwater Laboratories, Inc. These tests investigated the compatibility of the jacket material with petroleum products, alcohols, and alcohol-gasoline mixtures; other physical properties of the tank's construction materials' and the corrosion protection properties of the jacket system in protecting the steel tank shell from external corrosion in accordance with U.L. 1746. The documentation you provided from U.L., and our own calls to their offices, assure us that the Total Containment Tank is authorized to use the listing mark of Underwriters Laboratories, Inc. and is now eligible for U.L. follow-up inspection service.

Based on the above U.L. test results and our examination of the system's detailed specifications that you provided, we consider the system to meet the final performance standards for new tanks as provided for in section 280.20(a)(5).

Sincerely,

James McCormick, Director
Policy and Standards Division
Office of Underground Storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

AUG 1 1990

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Review of Total Containment's "Enviroflex" Piping

FROM: Dave O'Brien, Chief
Standards Branch

TO: Lee Daniels
UST/LUST Program Coordinator
Region VII

This responds to your July 13, 1990 request for a review of the Total Containment's "Enviro Flex" piping technical submittal to Region VII in order to determine if their piping system is no less protective of human health and environment than the other piping methods allowed under Section 280.20(b)(l)-(3). A positive determination in this matter by the implementing Agency (in this case EPA) would assure users of the "enviro flex" product that they are in compliance with the requirements for new piping under Section 280.20(b)(4).

It is our determination that. the enviroflex prototype's design and construction meets the intent of the requirements for new piping in section 280.20(b). Based on the information provided by Total Containment to you, we have concluded that the enviroflex piping system is no less protective than the other methods allowed under Section 280.20(b)(l)-(3) for the reasons provided below.

First, as stated in the preamble to the final rule, it remains EPA's intent to avoid interfering whenever possible with the ongoing development of innovative and more environmentally protective new technologies (See 53 FR p37095, September 23 1988). Clearly, Total Containment's flexible piping/secondary containment system is innovative and intended to be environmentally protective. The Company's attempts to first install several Closely-monitored test/prototype sites nationwide we believe warrants special consideration by EPA.

Second, we have evaluated the technical information against our knowledge of the three most common failure modes of piping in the past and recognize that Total Containment has already tried to address them. The primary containment piping's materials of construction, plus the fact that it is all placed within a secondary containment jacket, should eliminate the threat of releases due to external corrosion. The flexible nature of the piping should address the types of piping failures that are due to accidents, frost heaves, and other stress-causing underground movements. Finally, we also noted the draft installation procedures provided, and the company's stated commitment to use ANSI/NFPA 30A, PEI/RP100, API 1615 as guidelines so the installation-caused releases are kept to a minimum. Each of the above features are aimed at the three major causes of release from piping we have witnessed to date.

The extensive nature of the static and dynamic testing already done by Dayco with reference to numerous existing standards (such as UL330 NFPA30, ANSI B31.3 and B31.4) demonstrate proper concern with the primary containment piping's design. Total Containment's submittal to U.L. for listing and the scheduling of other independent test lab work is appropriate and reassuring.

And finally, the fact that Total Containment also admits these installations are prototypes, will be continuously and automatically monitored, as well as having all the sumps inspected monthly, have caused us to conclude that this piping system is no less protective of human health and the environment than the other methods allowed under 28O.20(b)(1)-(3). However, please note that we may need to reconsider this determination in the future should Total Containment fails to get UL listing in a timely manner, does not pass their independent lab tests, or experiences operational problems with the integrity of the piping system that are detected through their continuous monitoring of the prototype systems,

If you want to discuss this matter further let me know. However, if you agree, when you discuss it with Total Containment, please remind them to check with State and local officials where they want to use the enviroflex system. As you know, they have to also satisfy those other governments' requirements which may be different or more stringent the EPA’s.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VII
726 MINNESOTA AVENUE
KANSAS CITY, KANSAS 66101

SEP 4 1990

Andrew Bowey
Technical Representative
Total Containment
306 Commerce Drive
Exton, Pennsylvania 19341

Dear Mr. Bowey:

The Office of Underground Storage Tanks has reviewed Total Containmant's "Enviroflex". piping and has determined, for the interim, that it meets the requirements for piping in 40 CFR. 280.20(b)(4) if certain conditions are met. Enclosed is a copy of that determination.

As stated, this determination is not final. It will be reconsidered by EPA if Total Containment fails to obtain a listing from the Underwriters Laboratories (UL) Inc. in a timely manner (one year), does not pass independent laboratory tests, or experiences operational problems with the integrity of the piping system at the facilities where it is currently installed. If any of these occur, owners who have installed this piping will be required to remove it. Please keep me informed on each of the above items.

Until a final determination by EPA is made, use of this piping will require that Total Containment fulfill the following special conditions for each facility where "Enviroflex" piping is used:

1. Piping will be continuously and automatically monitored,

2. All sumps will be inspected monthly,

3. Installation procedures will adhere to the requirements in ANSI/NFPA 30A, PEI/PRlOO, and API 1615, and

4. Records documenting compliance with these conditions will be kept on site.

Please send me a written response that Total Containment will adhere to these conditions. Of course, owners must meet all the regulatory requirements for underground storage tank systems.

During our telephone conversations you mentioned that some facilities in EPA, Region VII (Nebraska, Iowa, Kansas, and Missouri) are using "Enviroflex" piping. For each location, please provide the company's name, address, name of the person to Contact and their telephone number and the facility's name, address, person to contact and their telephone number.

Finally, please remember that owners must also comply with the requirements of the state and local agencies. They may be different or more stringent than EPA's.

If you would like to discuss this or have questions, please call me at (913.) 551-7651.

Sincere1y,

Lee Daniels
UST/LUST Program Coordinator

Enclosure

cc: Dave O'Brien, OUST
Clark Conklin, NSFM
Keith Bridson, IDNR
Gary Blackburn, KDHE
Gordon Ackley, MDNR
RPM's Region 1 - 10

Minnesota Pollution Control Agency

May 6, 1993

Mr. Gerald Phillips
Office of Underground Storage Tanks
U.S. Environmental Protection Agency
Region V (HRU-8J)
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Dear Mr. Phillips:

RE: New PP4 test Station for Testing cathodic Protection on Steel Tanks and Piping

At issue is Federal Rule 40 CFR 280.31(b), Qualifications for Corrosion personnel, which states that a qualified corrosion protection tester who can demonstrate education and experience in the measurement of cathodic protection of buried or submerged piping and metal tanks must be used to test the cathodic protection on buried metal tanks and piping.

Effective February 4, 1993, the Steel Tank Institute (STI) requires that all sti-P3 tank systems be equipped with the new PP4 test station which has a permanently installed reference cell buried beneath the tank and a permanently mounted test station.

The PP4 test station was developed for STI by William P. Carlson and James B. Bushman of Corrpro Companies, Inc., Medina, Ohio. Of relevance here is Environmental Protection Agency's (EPA) earlier determination that a corrosion expert need not be used to design or install a field-designed corrosion protection~system for piping if the applicable part of the guidance document PEI RP-100 is followed because the document was written by a corrosion expert. (Refer to enclosure entitled, “Questions and Answers”).

A logical corollary to this EPA ruling would be a determination that owners/operators of steel underground storage tank (UST) systems be required to monitor the cathodic protection on these systems if they are equipped with a PP4 system because it was designed by corrosion experts.

An optional testing device for the PP4 test system is available which allows the tank owner to test his own tank and piping for cathodic protection. Detailed instructions are included with the testing device which is a simple voltmeter which gives a qualitative pass-fail response.

Since the test is simple to perform, it is the position of the Minnesota Pollution Control Agency (MPCA) that the Federal Rule should be interpreted to allow the owner/operator or his designee to test the tank and piping for cathodic protection.

For purposes of comparison, I wish to point out that most release detection monitoring is done by the owner/operator without the requirement that they retain the services of an expert to do this for them. The MPCA believes that the Federal UST rule is set up as a self-monitoring program and in keeping with this, owners/operators should be allowed to do their own corrosion protection monitoring if their UST systems are equipped with PP4 test stations.

Since STI requires that all STI-P3 tank systems manufactured since February 4, 1993, be equipped with the permanent PP4 test system and since it is being promoted as a test-it-yourself system, an expedited ruling on this matter would be greatly appreciated.

Sincerely,

/S/

Beth G.. Lockwood, Supervisor
Compliance and Assistance Unit
Tanks and Spill Section
Hazardous Waste Division

BGL: vb

cc: First Lieutenant Arthur R. Nash, Jr., Region V - Michigan
Ms. Deloras Sieja, EPA Region V
Mr. James McCaslin, Region V - Illinois
Mr. John Gunter, Region V - Indiana
Mr. Mike Williams, Region V - Ohio
Mr. William J. Morrissey, Region V - Wisconsin

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

October 27, 1993

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: STI PP4 Test Station for Cathodic Protection Monitoring

FROM: David Ziegele, Director /s/
Office of Underground Storage Tanks

TO: Gerry Phillips, Chief
Region 5 Office of Underground Storage Tanks

In a May 6, 1993, letter to you (copy attached), Beth Lockwood of the Minnesota Pollution Control Agency (MPCA) asked that an interpretation be given for a corrosion control testing device that is permanently installed during placement of a STI-p3 tank. Her question, paraphrased, asks:

"Can an owner/operator test his own cathodic protection system using the Steel Tank Institute's "PP4" cathodic protection testing apparatus?"

The answer is yes, an owner/operator can test his cathodic protection system using the "PP4" tank testing apparatus. The following discussion explains why.

The Steel Tank Institute's STI-P3 tank is a tank system that includes a cathodic protection system that was pre-engineered and designed by a corrosion expert. The installation of the corrosion protection aspects of this tank system do not require further cathodic protection design considerations because the cathodic protection system was designed and packaged by a corrosion expert. Installation of the tank system must be performed by qualified installation personnel.

Similarly, the "PP4" test system and test measurement device were designed and developed by corrosion experts to provide the owner/operator with a means to check and verify that the cathodic protection system is operating properly. The use of the "PP4" system meets the requirements given in § 280.31[b] All UST systems with cathodic protection systems must be inspected for proper operation by a qualified cathodic protection tester in accordance with the following requirements.... The simplicity and ease of use of this device allow test measurements to be taken easily and readily interpreted by the owner/operator without extensive knowledge about the dynamics of corrosion or corrosion protection.

The owner/operator still will have to meet the requirements given in § 280.31 Operation and Maintenance or Corrosion Protection, particularly related to the test frequency and record keeping requirements. Also the owner/operator must be able to demonstrate to an inspector the operation of the PP4 system.

I hope this interpretation answers MPCA's question. Please contact Randy Nelson (703-308-8565) or David Wiley (703-308-8877) if you have any questions or need additional information.

Attachment

cc: UST/LUST Regional Program Managers
UST/LUST Regional Branch Chiefs
UST/LUST Regional Attorneys
Dawn Messier, OGC
Milton Robinson, OE
OUST Management Team

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 8 1994

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. John D. Barnes
Manager, Government and Public Affairs
Steel Tank Institute
570 Oakwood Road
Lake Zurich, IL 60047

Dear Mr. Barnes:

In late April 1994, the Steel Tank Institute (STI) notified the Environmental Protection Agency (EPA) of its desire to withdraw its request for EPA to relax the mandated frequency for monitoring the cathodic protection of federally regulated sti-P3® underground storage tanks (USTs). By return letter the Agency honored STI's request. The purpose of this letter is to respond to your letter of May 12, 1994 to Administrator Browner (copy enclosed) by which STI notified EPA of its desire to continue to seek relaxation of the federal requirement for monitoring cathodic protection systems on sti-P3® USTs. This letter also provides information on the <u>Federal Register</u> Notice of Data Availability, which solicited public comments on this issue and on the Tillinghast study. Enclosed are copies of the <u>Federal Register</u> notice and EPA's Comment-Response document.

Your May 12th letter states "The Notice of Data Availability (NDA) process was suggested to STI by the EPA Office of Underground Storage Tanks (OUST) as a way to accomplish the amendment of the monitoring mandate...." This statement is misleading. In response to STI's request for relaxation of the monitoring requirement, EPA voluntarily chose to publish a NDA as a mechanism to obtain public comment and a broader perspective on the technical issue under consideration, and as one of several sources of information to be used in the Agency's deliberative process. At no time was there a presumption that publishing the NDA would mean that the Agency intended to relax the requirement or that it was a necessary precondition to making such a change should the Agency decide to do so.

We have carefully reviewed STI's arguments, the Tillinghast study and all other information submitted to the docket as of the end of January, 1994. The Agency has decided not to take any action at this time to relax the frequency requirement for cathodic protection monitoring of sti-P3® tanks.

BACKGROUND

In 1992, STI and its members requested that EPA relax the frequency requirement for ongoing cathodic protection monitoring of certain regulated USTs. This requirement, found at 40 CFR 280.31(b)(1), requires that "all cathodic protection systems must be tested within 6 months of installation and at least every 3 years thereafter or according to another reasonable time frame established by the implementing agency...." STI requested that EPA, as an implementing agency, alter the required frequency for sti-P3® tanks to be at the time of installation and subsequently only after any disturbance of the excavation into which the tank had been placed. EPA indicated that it did not have data sufficient to support relaxing the requirement at that time.

STI then contracted with Tillinghast, a Towers Perrin Company, to perform a study of the issue and provide a report of the findings. EPA, after informing STI of its intentions to do so, made the report, titled "Evaluation Of The Potential For External Corrosion And Review Of Cathodic Protection Monitoring Associated With sti-P3® Underground Storage Tanks," available to the public. Although not required to, on October 25, 1993, EPA published a Notice of Data Availability in the *Federal Register* and requested public comments on the report. The comment summaries and EPA's responses provided in the enclosed document.

DISCUSSION

STI and its members asserted that the required frequency for cathodic protection monitoring of sti-P3® tanks should be relaxed for the following reasons:

- o sti-P3®'s excellent performance record;
- o Cathodic protection monitoring duplicates the effort of the required monthly leak detection checks;
- o Regulatory inequity between existing steel tanks without corrosion protection, which are not subject to the requirement, and sti-P3® tanks;
- o Periodic deflection monitoring for fiberglass-reinforced plastic (FRP) tanks is not required;

- Tendency for the monitoring requirement to affect UST buyers' choices;
- Industry's high cost of compliance; and
- Lack of regulatory enforcement efforts directed at cathodic protection and its monitoring.

EPA's responses are summarized below. For additional discussion, see the enclosed Comment-Response document.

<u>sti-P3®'s performance record</u>

The information provided to EPA from STI and other sources shows that, to date, sti-P3® tanks appear to have a very good record of not failing due to external corrosion. However, there are several reasons why the data presented by STI are not compelling enough to warrant relaxation of the monitoring requirement at this time. The first is the youth of the installed sti-P3® tanks relative to their expected service life. No sti-P3® tank has been in the ground for a period of time equal to the current 30-year warranty period. The vast majority of the more than 200,000 sti-P3® tanks installed are less than nine years old. Though the Tillinghast report provided some information on older tanks (registered 1970-75), the information in the report is largely from the more common younger tanks. Indeed, compelling data may not exist at this time, due to the relative youth of the sti-P3® population. Secondly, and importantly, cathodic protection monitoring data show that eight percent or more of tanks tested cannot be shown with certainty to meet the industry standard for cathodic protection. This does not mean that these tanks are corroding, but it does mean that, for whatever reason, there is not certainty that they are not. Finally, as the Tillinghast report and many commenters pointed out, problems with sti-P3® tanks due to external corrosion have been documented.

<u>Cathodic protection monitoring and the required monthly leak detection checks</u>

The cathodic protection monitoring requirement, while it shares some similarities with the leak detection monitoring requirements, serves a fundamentally different purpose, and therefore does not duplicate the leak detection effort. Cathodic protection systems and the requirements for monitoring them are designed to reduce the likelihood that any release from an UST will occur and is, therefore, a method of pollution prevention. Leak detection monitoring helps reduce the chances that a leak will become significant, but in general is not designed to reduce the likelihood of a leak.

Regulatory requirements for existing steel tanks without corrosion protection and for cathodically protected USTs

While it is true that the UST regulations do not require monitoring of existing steel tanks without corrosion protection ("bare steel tanks") and that they can continue in service until 1998, this does not warrant relaxation of the requirements for cathodically protected steel tanks. EPA still believes, as it did when the final technical rule was promulgated in 1988, that even though bare steel tanks pose a significant environmental threat, a compliance period of less than 10 years for replacing or upgrading these tanks was not feasible due to the large universe of unprotected tanks. The same considerations did not, and still do not, apply to cathodically protected tanks. No one contends that there are not enough testers available to meet the required frequency, and as discussed below, once a tank is cathodically protected, complying with the monitoring requirements does not pose an undue burden on the regulated community. Meanwhile, it is important for cathodically protected tanks to be monitored, to ensure that they are indeed protected, and to ensure that they do not add to the threat already posed by existing bare steel tanks. EPA also would like to note that any apparent inequity caused by the monitoring requirement is diminished by the fact that bare steel tanks must be replaced, upgraded, or closed by 1998, at significant expense to the owner or operator, while sti-P3® tanks (with spill and overfill equipment) need not be.

Deflection monitoring for fiberglass-reinforced plastic (FRP) tanks

While it is true that FRP tanks are not subject to ongoing tank wall deflection monitoring to ensure protection against structural failure, the Agency believes that this is not a valid reason to eliminate or reduce the cathodic protection monitoring requirement for sti-P3® tanks. Tank wall deflection in FRP tanks is a fundamentally different physical phenomenon from external corrosion of steel tanks. Because each tank technology is different, EPA imposed technical standards which require testing methods and frequencies specific to the technology used. Therefore, such comparisons are not persuasive.

The monitoring requirement and UST buyers' choices

In response to concerns that the cathodic protection monitoring requirement affects buyers' choices, this influence may occur, but EPA believes it is only one of several factors that have led to changes in the market shares for various tank technologies over the past few years. EPA believes that all the technologies allowed in the final technical rule (40 CFR 280.20), when operated in accordance with EPA regulations, are protective of human health and the environment. As for cathodically protected steel tanks, STI's proposal implicitly recognizes (i.e., by supporting monitoring when conditions suggest that the system may be compromised), that the sti-P3® tank is fully protective only if the cathodic protection system is operating properly. For the reasons set out in this letter and the Comment-Response document, EPA believes that monitoring every three years is a reasonable, and not particularly burdensome, way to ensure that the system is fully protective. In addition, monitoring can be viewed as a benefit to potential customers, because it ensures that an owner's equipment is performing as it should.

Industry's cost of compliance

As stated in the preamble to the final UST technical rules, EPA recognizes that the UST community in large part is composed of small businesses with limited resources and that, wherever possible, EPA's rules should accommodate this fact. See 53 Fed. Reg. 37084 (Sept. 23, 1988). The Agency believes that the present monitoring requirement does not contravene this operating principle, because the information before EPA demonstrates that cathodic protection monitoring is easy to perform and inexpensive relative to other costs of operating USTs, and especially relative to costs of pollution remediation. Regarding ease of use, problems commonly reported with monitoring often can be rectified by relatively simple means. Regarding costs, the information EPA received shows that cathodic protection monitoring costs generally range from $95 up to a few hundred dollars for a typical location with three tanks. This cost, incurred every three years, is insignificant relative to many other expenses involved in installing and operating USTs. In addition, monitoring is very inexpensive in terms of both time and money relative to the costs of cleaning up a leak. EPA believes that the effort and costs of monitoring are reasonable, do not pose an unnecessary burden, and may save owners and operators from significant expenses in the long run.

Regulatory enforcement efforts directed at cathodic protection and its monitoring

Enforcement priorities for UST systems may differ state by state. However, the extent of current enforcement activity does not determine the need for cathodic protection monitoring. In many states, enforcement of the leak detection requirements has priority over the cathodic protection monitoring requirements, partly because of the earlier deadlines for all tanks to be in compliance with the leak detection requirements. However, with the upcoming 1998 compliance deadline for corrosion protection of all regulated USTs, the emphasis likely will shift to include more vigorous enforcement of the cathodic protection monitoring requirements. EPA believes that cathodic protection monitoring is an important component of pollution prevention for USTs.

CONCLUSION

In addition to the fact that the Agency is unpersuaded by STI's arguments addressed above, it is important to note that STI seeks a relaxation of the monitoring frequency despite the fact that the Tillinghast report was not able to come to any conclusion regarding an appropriate frequency. STI's position that post-installation monitoring should be limited to instances of disturbance of the excavation, without supporting data and/or analyses, is unpersuasive. This is because site conditions which can affect the performance of the anodes can occur or change without the owner or operator's knowledge (e.g., stray currents that may overpower anodes). Therefore, absent data that would alleviate this concern, the Agency cannot say that STI's proposed frequency would be, as EPA determined in promulgating the current 3-year monitoring frequency, "sufficient to detect any damage or failure of the system and to take remedial action in time to prevent structural failures due to corrosion" (see, 53 FR 37137).

Furthermore, EPA's decision not to relax the cathodic protection monitoring requirement also is strongly supported by the fact that several national standards, from both industry and government, place stricter requirements on cathodic protection monitoring than do EPA's UST regulations. Please see the enclosed table comparing several national standards' cathodic protection monitoring requirements.

In short, EPA believes that the information before it is not compelling enough to warrant relaxation of the cathodic protection monitoring requirement at this time. EPA continues to believe that steel tanks, protected from corrosion according to both industry standards and Agency regulations, remain protective of human health and the environment. The fact that cathodic protection monitoring of sti-P3® tanks is possible and required means that owners and operators are likely to make sure that the environment - and their investment - remains protected.

A copy of this letter and of EPA's Comment-Response document will be sent to all those who have expressed interest in this issue, including those who submitted written comments.

Sincerely yours,

David W. Ziegele, Director
Office of Underground Storage Tanks

Enclosures:

1. May 12, 1994 letter from John Barnes, STI
2. Federal Register Notice of Data Availability
3. EPA Comment-Response document
4. Table of Standards for Cathodic Protection Monitoring

cc: State UST Program Managers (without Encl. 3)
UST/LUST Regional Program Managers
UST/LUST Regional Branch Chiefs (without Encl. 2 and 3)
Dawn Messier, OGC
Susan O'Keefe, OECA/RCRA
OUST Management Team (without enclosures)

STIRepl6.W51

E N V I R O N M E N T A L   P R O T E C T I O N   A G E N C Y

40 CFR Part 280

Evaluation of the Potential for External Corrosion and Review of Cathodic Protection Monitoring Associated with sti-P3 Underground Storage Tanks: Notice of Data Availability

AGENCY: Environmental Protection Agency.

ACTION: Notice of Data Availability.

SUMMARY: The Environmental Protection Agency (EPA) is today publishing a notice of data availability regarding a report completed by Tillinghast, a Towers Perrin Company, on behalf of the Steel Tank Institute (STI). The Tillinghast report examines the potential for external corrosion of sti-P3 underground storage tanks (USTs) as well as owners' and operators' corrosion monitoring practices for USTs. The Agency's current regulations for corrosion monitoring require periodic post-installation monitoring of cathodically protected steel underground storage tanks. The Steel Tank Institute approached EPA in 1992, requesting it alter the mandated monitoring frequency for cathodic protection monitoring of steel USTs, and specifically, USTs manufactured by STI members under the "sti-P3" specification. EPA responded by agreeing to

consider data supplied by an independent, third-party examination of STI's initial findings, as part of an overall data collection process. This notice summarizes the methodology, findings, and conclusions of the study. EPA encourages public review and comment on the Tillinghast report, as it may be used in arriving at a final determination regarding STI's request for EPA to modify the current requirements for cathodic protection monitoring for steel underground storage tanks.

DATES: Written comments on this notice must be submitted on or before [insert date 60 days after publication in the Federal Register].

ADDRESSES: Written comments on today's supplemental notice should be addressed to the docket clerk at the following address: U.S. Environmental Protection Agency, RCRA Docket (OS-305), 401 M Street, S.W., Washington, DC 20460. One original and two copies of comments should be sent and identified by regulatory docket reference number XX-XXXXX. The docket is open from 9:00 a.m. to 4:00 p.m., Monday through Friday, excluding Federal holidays. Docket materials may be reviewed by appointment by calling (202) 260-9327. Copies of docket materials may be made at no cost, with a maximum of 100 pages of material from any one regulatory docket. Additional copies are $0.15 per page. For a copy of the Tillinghast report, contact the EPA RCRA Docket.

FOR FURTHER INFORMATION CONTACT: For general information about this supplemental notice, contact the RCRA/Superfund/OUST Hotline, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency Washington, DC 20460, (800) 424-9346 (toll-free) or (703) 412-9810 (local). For the hearing impaired, the number is (800) 553-7672 (toll-free).

SUPPLEMENTARY INFORMATION:

I. Background

A. Technical Requirements for Underground Storage Tanks

Final regulations for Underground Storage Tanks (USTs) containing regulated substances were promulgated by the Agency in September and October, 1988 and became effective in December, 1988 and January, 1989. The regulations include technical requirements for new and existing underground storage tanks and piping, financial responsibility requirements for UST owners and operators, and state program approval requirements. In order to prevent releases, EPA included in the technical requirements four important categories of preventative measures: (1) tank design and installation, (2) release detection, (3) corrosion protection, and (4) spill and overfill control. All UST systems installed after December 22, 1988 must meet Federal requirements immediately. Owners of tank systems installed on or before that date have until December 22, 1998 to either upgrade their tanks with corrosion protection and spill and overfill devices, replace them with new tank systems, or close them in accordance with the regulatory requirements.

According to a study conducted for EPA in 1987, corrosion of tanks and piping was a major cause of UST system releases. At that time, most installed USTs and piping were constructed of "bare steel" -- steel without corrosion protection. When buried in the ground, steel without corrosion protection can be destroyed by external corrosion, resulting in leaks. One type of corrosion protection is cathodic protection, which is a technique to prevent corrosion of a surface by making that surface the cathode of an electrochemical cell. For UST systems, this can be done by applying either galvanic anodes or impressed electric current.

The UST regulations include requirements for the operation and maintenance of corrosion protection of steel UST systems. As part of these requirements, owners and operators of steel UST systems equipped with cathodic protection must ensure that all cathodic protection systems are tested within 6 months of installation and at least every 3 years thereafter, or according to another reasonable time frame established by the implementing agency. *See* 40 CFR 280.31(b)(1). The Preamble to the rule noted that, "After consultation with groups of industry experts during the public comment period, EPA now agrees with the commenters who recommended that all cathodic protection systems should be tested at the same frequency and the Agency is now requiring in the final rule that all cathodic protection systems be tested within 6 months of installation and at least every 3 years thereafter. These intervals are sufficient to detect any damage or failure of the system and to take remedial action in time to prevent structural failures due to corrosion. EPA understands that this time interval is consistent with sound practice as is now recommended in the recently revised NACE [(National Association of Corrosion Engineers)] code and by major tank manufacturers." See 53 **Fed. Reg.** 37137.

B. Steel Tank Institute Request and Study Report

The Steel Tank Institute (STI) is a trade organization comprised of steel tank manufacturers. STI members manufacture pre-engineered underground storage tanks built to the "sti-P3" specification, for storage of liquids at atmospheric pressure. Tanks meeting the sti-P3 specification employ three types of corrosion protection: (1) dielectric coating, (2) electrical isolation, and (3) cathodic protection through factory-installed anodes. More than 200,000 sti-P3 tanks have been fabricated and placed in use since 1969, the vast majority since 1985, and they are commonly installed today.

Single-wall sti-P3 tanks in service for storage of Federally regulated substances are covered by the cathodic protection monitoring requirements outlined above. Those tank owners who installed sti-P3 tanks in Federally regulated service between late 1988 and February of 1993 were eligible to enroll in STI's "Watchdog" cathodic protection monitoring service. The Watchdog service, performed through STI, provides cathodic protection monitoring in compliance with the EPA requirements. Since February of 1993, a simplified, user-friendly cathodic protection monitoring test system with a buried reference cell is installed with new sti-P3 tanks subject to Federal UST regulations. Those sti-P3 systems installed prior to 1988 have been operated without cathodic protection monitoring in most cases.

In the spring of 1992, STI requested that EPA alter the frequency of cathodic protection monitoring from the current requirements, to monitoring within 6 months of installation and subsequently only after any disturbance of the excavation (e.g., retrofit of Stage II vapor recovery systems). Periodic monitoring would therefore not be required. STI provided data on the performance of sti-P3 tanks and on potential costs for cathodic protection monitoring of sti-P3 tanks in support of its request.

STI and its members believe that the mandated frequency for cathodic protection monitoring should be changed for the following reasons:

* The sti-P3 tank has a very good performance record;

* The much more frequent monthly leak detection checks required by the UST regulations supersede the need for cathodic protection monitoring;

* There is inequity in that thousands of existing steel tanks without corrosion protection, which are much more likely to fail before phase-out in 1998, are not subject to the cathodic protection monitoring requirement;

* Periodic tank deflection monitoring for fiberglass-reinforced plastic (FRP) tanks was not required in EPA's UST regulations due to the low incidence of failure in FRP tanks (less than 0.5 percent), and sti-P3 tanks have similarly low failure rates;

* UST buyers consider cathodic protection monitoring and the associated recordkeeping required with steel tanks to be an inconvenience, and this affects buyers' choices among UST technologies;

* There is a high cost of compliance to industry; and

* Regulatory enforcement efforts are directed at clean-ups and leak detection, not cathodic protection -- an indicator that monitoring cathodic protection is not an essential activity

towards protecting human health and the environment.

The Agency took no regulatory action in response to STI's request and the supporting information. STI asked Tillinghast, an international risk management and actuarial consulting firm with experience in underground storage issues, to conduct an independent, third-party audit of STI's data. In May of 1993, STI provided the Agency with a report prepared by Tillinghast titled "Evaluation Of The Potential For External Corrosion And Review Of Cathodic Protection Monitoring Associated With sti-P3 Underground Storage Tanks." An abstract of the report follows.

The pollution prevention components of the UST regulations (including corrosion protection) are very important to the UST program. Therefore, the Agency has decided to publish this Notice of Data Availability and solicit public comment on the report to ensure a more complete understanding of the issue at hand. This Notice includes several questions to help guide public discussion. The Agency is interested in responses to any of the questions listed below, and other issues the public may identify, such as the costs/benefits of the monitoring requirement itself.

II. Abstract

In May 1993, Tillinghast completed a study on behalf of the Steel Tank Institute (STI) which surveyed tank owners, tank installers, and regulators to identify any instances of failures of sti-P3 tanks attributed to external corrosion and to obtain experience information on cathodic protection monitoring practices. A summary of Tillinghast's methodology, findings, and conclusions follows.

Methodology

Tillinghast telephone-surveyed randomly selected sti-P3 underground storage tank (UST) owners and tank installers as well as Federal and State UST regulators about the condition and general maintenance of sti-P3 tanks. These individuals, along with data from the STI Watchdog program (a corrosion monitoring program initiated by STI in 1988 to assist tank owners in complying with EPA corrosion monitoring requirements) provided information on the frequency, conditions, and other aspects of the cathodic protection monitoring practices for sti-P3 tanks. In addition, the survey sought performance history on sti-P3 tanks which were not subject to cathodic protection testing. Tillinghast also examined environmental impairment, warranty, and product liability insurance claims from the Steel Tank Insurance Company (STICO, a captive insurance company formed by steel tank manufacturers).

Tillinghast selected a sample of owners and installers through STI's computer data base containing over 200,000 registered tanks. The sample covered the following nine states: Washington, Virginia, Vermont, South Dakota, Colorado, Florida, Texas, Missouri and Kentucky. The nine states represented a variety of climates, tank environments, saturation periods, water tables, and soil conditions. Tillinghast's sample also included a variety of tank sizes (from 500 to 20,000 gallons) and contained petroleum marketers and non-marketers. Tillinghast examined the following registration periods: 1970-75, 1980-81, 1985, and 1990. The examined registration periods begin in 1970 when sti-P3 tanks first became well known to owners/operators and continue to the present.

Tillinghast successfully contacted 110 owners with immediate supervision over 385 sti-P3 tanks and secondary responsibility for approximately 2500 sti-P3 tanks at other locations. In addition, researchers contacted 37 installers throughout the geographic sample who had experience in over 5000 sti-P3 tank installations. Finally, Tillinghast contacted the Environmental Protection Agency's ten Regional UST offices as well as each of the nine State UST regulatory offices included in the sample.

Tillinghast obtained summary information on 103 environmental impairment and product liability insurance closed claims for sti-P3 tanks from STICO to identify any instances where payment was made due to a product release. Tillinghast also randomly selected eight of the 103 claims to specifically review the "cause of incident" data.

Findings

Tillinghast identified findings related to the following areas: testing of cathodic protection systems, cathodic protection monitoring practices, environmental and product liability claims, and understanding of and compliance with EPA's technical requirements.

Tillinghast's survey of tank owners and installers covered over 8,000 sti-P3 tanks. Within the surveyed population, respondents reported three instances of sti-P3 tank external corrosion -- one of which involved a product release. Of the regulators Tillinghast surveyed, those who had witnessed the removal of sti-P3 tanks reported that the tanks and sacrificial anodes were in "excellent condition upon removal." Regulators did not provide information on the ages of the tanks that were considered to be in "excellent condition upon removal."

Tillinghast reported that corrosion monitoring requirements (and the technical basis for those requirements) are not well understood by most tank owners, installers, or regulators. Furthermore, Tillinghast reported that unless an sti-P3 owner/installer signed up for STI's Watchdog program, cathodic protection monitoring for sti-P3 tanks installed since the promulgation of EPA's technical regulations was generally not being performed, although some large sti-P3 tanks users did perform independent testing.

Tillinghast's review of data from STI and from owners' research indicated that test variability can be high for corrosion monitoring tests conducted on any given site. Watchdog participants and major oil companies (many of whom conduct their own corrosion monitoring) reported few readings less than the 850 millivolt compliance point for corrosion monitoring. Tillinghast identified human error (in tank installation or testing) as one cause for obtaining disreputable corrosion monitoring results. Unusually dry soil conditions and other physical factors also influenced the accuracy of cathodic protection system testing.

Tillinghast obtained data from installers, tank owners, and major oil companies on the annual cost of corrosion monitoring. The data showed the annual cost of corrosion monitoring to range from $130 to $500 per location (each location having an average of 3.2 tanks). The impact of these costs was greatest on small, single location owners due to the necessity of hiring a contractor to travel to the site to perform the monitoring.

Tillinghast's investigation of STICO limited warranty and environmental and product liability insurance closed claims revealed that most of the sti-P3 claims that entailed both administrative and investigative costs involved improper installation techniques or errors in tank manufacturing workmanship. Fifty-six of the 103 claims incurred administrative expense but no claims costs or expenses, leaving 47 others which incurred some sort of investigative cost (e.g., tightness test). Only four of the 47 incidents in which investigative cost was incurred actually involved a claims payment. Tillinghast's review of eight randomly chosen closed claims for "cause of incident" data demonstrated that a pattern of faulty workmanship, bad installation, or a combination of both resulted in corroded sti-P3 tanks.

Conclusions

Tillinghast found no instances of external corrosion of sti-P3 tanks that had been properly fabricated, transported, and installed. Of the more than 8000 sti-P3 tank installations represented by owners and installers, only three instances of external corrosion were reported, a frequency of 0.04%, and only one involved a product release. Tillinghast did not have enough corrosion monitoring data to statistically determine an optimum monitoring frequency for cathodic protection. Tillinghast's survey concluded that less than 10% of the Watchdog participants or major oil companies who maintain their own corrosion monitoring programs and installed sti-P3 tanks in 1990, reported readings below the 850 millivolt compliance point for corrosion monitoring. Finally, Watchdog monitoring data from 1991, 1992, and the first quarter of 1993 indicate that based on cathodic protection monitoring readings, the number of sti-P3 tanks with cathodic protection readings of -850 millivolts or greater is increasing.

III. Public Comments

EPA is interested in any comments that the public may have on the content of this report, and is especially interested in any additional quantitative data commenters may provide. In particular, the Agency is interested in receiving answers to the questions listed below.

* What data are available that confirm or refute the report's findings on corrosion protection of sti-P3 USTs? In particular, have problems with corrosion protection (such as external corrosion) on sti-P3 tanks been observed? If so, what were the numbers, types, severity, and impacts of these problems? What were the ages of any sti-P3 tanks with problems with corrosion protection, and were these problems caused during, before, or after installation? What are the sti-P3 label numbers, if available, for verification purposes?

* For any sti-P3 tanks observed to have problems with corrosion protection,

including tanks and piping, did cathodic protection monitoring indicate a lack of protection? If so, when was a lack of protection found -- within 6 months of installation or during a later test? If monitoring was not performed, would it have indicated a lack of protection if it had been done?

* What data are available addressing the above issues for cathodically protected steel USTs that are not sti-P3 USTs? If problems were observed, were they observed with field installed or with factory installed cathodic protection systems?

* What information is available confirming or refuting the study's representation of the costs and benefits of cathodic protection monitoring of UST systems?

* How does the simplified, permanently installed cathodic protection monitoring system, now installed with new Federally regulated sti-P3 tanks, change cathodic protection monitoring practices and its costs and benefits?

* If the study were performed 10 years later and again 20 years later, would the findings be expected to be the same? Why or why not?

* What experiences or studies in other applications of cathodic protection may provide insights into the long-term performance of cathodic protection on USTs and the costs and benefits of cathodic protection monitoring?

IV. Schedule for Final Determination

After review and evaluation of the public comments on this notice, EPA will conduct internal deliberations to arrive at a final determination of the Agency's position on the required frequency of cathodic protection monitoring. The Agency plans to reach a determination by [Date], 1993. This determination may take the form of no action, guidance, changes to the technical regulations, or some other regulatory action.

Dated: [Date], 1993

Richard J. Guimond

Acting Assistant Administrator.

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SUMMARY OF COMMENTS AND EPA RESPONSES
Notice of Data Availability in the Federal Register, October 25, 1993

The Agency received 228 comments in response to the Notice of Data Availability published in the Federal Register, October 25, 1993. In general, the commenters represent the manufacturers, distributors, and installers from the steel tank, petroleum equipment, and fiberglass and composite tank industries. A list of the commenters is attached.

The comment summaries and EPA's responses are organized into seven sections. The organization of the document is provided below.

1. General Support or Opposition

One commenter (Corrosion Associated, Inc.) feels that the impetus for revising the current monitoring requirement has been pressure from lobbyists who are trying to sell more steel tanks. He cautions the Agency to get input on the matter from corrosion experts. One commenter (Fiberglass Petroleum Tank & Piping Institute) implies that some of the impetus for the request to modify the monitoring requirement has been declining sales of sti-P3® tanks. The commenter argues that the Agency should not consider the Steel Tank Institute's request for elimination of cathodic protection monitoring requirements because its mission is to protect health and the environment, not to protect one product from competition.

Several commenters (Corrosion Associates, Inc.; Association of State and Territorial Solid Waste Management Officials [ASTSWMO]) noted that the sti-P3® tanks are still new enough that leaks due to corrosion have not been a big problem. Another commenter (NACE International) adds that its experience indicates that the average time between installation and failure of unprotected bare steel tanks is between eight and 12 years. The commenter feels that it is possible that more sti-P3® tank failures will occur in the next few years. Another commenter (New York State Department of Environmental Conservation) indicated that problems with bare steel tanks generally take 18 years to become evident. The commenter suggested that sti-P3® tanks have not yet been time tested, and that problems with the tanks will very likely occur in approximately 10 years. One commenter (Marcel Moreau Associates) noted that a proper assessment of the tanks' performance cannot be made until the tanks have been in the ground for approximately 20 years. All of these commenters argued that continued monitoring is necessary until sti-P3® tanks have been time tested.

One commenter (Fiberglass Petroleum Tank & Pipe Institute) says that the Tillinghast report does not say whether tanks will be able to resist corrosion over the 30-year tank design life. Only 53 of the 384 tanks in the sample were over ten years old. The commenter notes that even bare steel tanks generally do not develop corrosion failures for at least 10 years. The commenter therefore feels that the Tillinghast report does not prove anything.

Many commenters[1] stated that the Steel Tank Institute gives a 30-year warranty on the sti-P3® tanks. These commenters felt that the length of this warranty indicates the soundness and dependability of the sti-P3® tank. However, another commenter (Xerxes Corporation) states that the Steel Tank Institute's 30 year guarantee is immaterial to whether cathodic protection should be monitored. This commenter argues that the cathodic protection system is on the tank to insure that the tank fulfills this service life, and the monitoring is designed to audit the functioning of the cathodic protection system. Another commenter (Green Environmental & Corrosion, Inc.) states that from an engineering perspective, all engineered systems, including all tank technologies, require monitoring.

Another commenter (Fiberglass Petroleum Tank & Pipe Institute) provided copies of six articles published in the last few years in Tank Talk, a Steel Tank Institute-published newsletter about USTs. Collectively, the articles show that the Steel Tank Institute has in the past supported cathodic protection monitoring as an effective, inexpensive means of preventing leaks. This commenter notes that many national standards support cathodic protection monitoring. The standards cited by the commenter were: NACE International, Canadian

Council of Ministers of the Environment, National Standard of Canada, Petroleum Equipment Institute, American Petroleum Institute, National Fire Protection Association, and the Uniform Fire Code. The commenter notes that there are two significant areas in which the Agency's requirements are more lenient than the majority of these standards. First, the Agency insists on monitoring of the cathodic protection system within six months of installation. However, six of the seven aforementioned standards suggest monitoring at installation, while API suggests monitoring six to twelve weeks after installation. Second, the Agency is more lenient in its requirements for monitoring during the lifetime of a tank. Five of the seven standards suggest annual monitoring, while the National Standard of Canada suggests monitoring every two years. (Timing of post-installation monitoring requirements were not cited for the seventh standard.) The commenter also notes that the U.S. Department of Transportation supports annual monitoring of the cathodic protection systems used to protect petroleum pipelines in this country.

This commenter (Fiberglass Petroleum Tank & Pipe Institute) also cites papers from several cathodic protection experts who advocate monitoring of cathodic protection systems. One expert stresses that cathodic protection is inexpensive and easy to maintain. Another points out that because no tanks or pipe coatings are perfect, they must be supplemented with cathodic protection. This expert states that without adequate monitoring, cathodic protection may not continue to function. Another expert reports that a maintenance program for a cathodic protection system is necessary because the external tank coating may deteriorate or become damaged.

One commenter (Fiberglass Petroleum Tank & Pipe Institute) noted that the dielectric protective coating on an sti-P3® tank, which is 30 mil thick, is much thinner than the fiberglass coating on a steel-clad tank, and thinner than a fiberglass-reinforced-plastic tank. This commenter argued that cathodic protection devices and a frequent monitoring program are therefore necessary to ensure long term environmental protection when using an sti-P3® tank.

One commenter (Northeast Utilities Service Company) notes that his company conducts monthly tests of the rectifier (the device that powers impressed systems by converting alternating current to direct current) for impressed current cathodic protection systems as well as annual tests of the entire system for impressed and galvanic systems. The commenter's company operates many diverse types of equipment, including approximately 100 UST systems. During the past four years, the commenter has identified approximately 50 cathodic protection problems on all types of equipment, twenty of which were associated with UST systems. The commenter notes that all of the problems were identified during routine monthly or annual inspections, but that these problems would not have been identified under STI's proposal to decrease the monitoring requirement to at time of installation and after disturbance of the UST excavation.

Several commenters (Corrosion Control Specialists, Inc.; Owens-Corning Fiberglass Corporation; NACE International) stated that inspections of the cathodic protection system should be performed annually by a qualified corrosion engineer.

Several commenters (Pump Masters, Inc.; The Coen Company) suggested that, based on their experience with several sti-P3® tanks each, the monitoring interval should be extended. One commenter (Pump Masters, Inc.) suggested that monitoring be performed at

10-year intervals, while another (The Coen Company) suggested monitoring the cathodes every five or 10 years in some soil conditions.

One commenter (Chem Met, Ltd., P.C.) suggested that if the monitoring interval is to be extended, the present schedule should be maintained for the initial five years, and then extended in individual circumstances if experience shows that the system is being properly maintained and monitored.

Another commenter (Beth Anderson) feels that requiring corrosion protection testing every three years for tanks may be excessive, but feels that the requirement for corrosion protection testing of steel piping should not be eliminated. The commenter bases this opinion on her own experience that pipes are often the cause of UST releases, and on the fact that the Tillinghast report did not appear to include a consideration of steel piping.

One commenter (New York State Department of Environmental Conservation) also indicated that if sti-P3® tanks were exempted from the monitoring requirement, all cathodically protected tank and piping systems would have to be given the same exemption. The commenter believes that an exemption for only the sti-P3® tanks would make it difficult to determine which tanks and piping systems required monitoring and which did not.

Several commenters (New York State Department of Environmental Conservation; Letter to David Ziegele from Anonymous) noted that anodes have a finite expected life span. The commenters indicated that the cathodic protection system must be monitored to determine when the useful life of the anode is over so that the system can be upgraded to ensure continued protection of the tank.

One commenter (Metal Products Company) feels that for years tank manufacturers have known how to produce a reliable tank but have chosen not to because consumers would not buy such an expensive tank. The commenter feels that regulations will lead people to buy reliable tanks like the sti-P3® tank.

Response

The Agency does not question the general quality or the short-term integrity of sti-P3® tanks. However, the Agency agrees with commenters who state that the populations of sti-P3® tanks that were included in the Tillinghast report and those used in UST systems throughout the country are relatively young. While many commenters noted that sti-P3® tanks carry a 30-year warranty, because no sti-P3® tanks have yet been in use for 30 years, the Agency takes the warranty as an indicator of predicted, rather than actual, performance. While corrosion is a complex process and age is not the sole factor in determining a tank's likelihood to fail due to external corrosion, the Agency agrees that age does play a role. The Agency still believes what was stated in the preamble to the proposed UST technical rules, that generally "[i]n order to be effective, these corrosion protection systems must be inspected and maintained. Corrosion protection systems can fail in a number of ways. For example, coatings can deteriorate, wire leads to cathodic protection can break, sacrificial anodes can be consumed, impressed current can be shorted or otherwise fail, adequate potential may not be maintained." See 52 Fed. Reg. 12706 (1987). This reasoning supported the requirement for *monitoring in the final technical rules promulgated in 1988, and the new information before the Agency does not lead it to question this finding. The Agency received no compelling data or arguments demonstrating that sti-P3® tank cathodic protection systems can be shown with certainty to remain protected against both short- and long-term corrosion processes if unmonitored, and therefore that regular monitoring of cathodic protection systems is unnecessary.*

Regarding the comment cautioning the Agency to get input on the matter from corrosion experts, the Agency agrees that getting such input is wise, and responds that this was one of the reasons for the Notice of Data Availability and request for comments. Input from corrosion experts was received and considered. Many experienced professionals in the corrosion prevention and control community advocate periodic monitoring of cathodic protection systems. In response to the comment arguing that the Agency should consider protection of health and the environment and not protection of one product, the Agency responds that the Notice of Data Availability and request for public comments were intended in large part to gather information to see if the monitoring requirements could be relaxed without diminishing protection of human health and the environment.

While the Agency agrees that any problems with sti-P3® tanks are more likely to emerge after the population has aged several more years, the Agency notes that commenters who stated that sti-P3® tanks will fail in increased numbers in the next few years or about 10 years after installation did not provide data supporting these comments.

The Agency agrees with the commenter who noted that several industry and government standards for cathodic protection monitoring are more stringent than EPA's UST requirements. The Agency also agrees with this commenter that corrosion experts have advocated monitoring of cathodic protection systems.

The Agency agrees with the commenters who suggested that regular monitoring of any UST corrosion protection system, including the sti-P3® cathodic protection system, is a sound engineering practice. The Agency acknowledges the comment noting that the dielectric coating on an sti-P3® tank is typically much thinner than, and different in composition from, the fiberglass in both fiberglass tanks and fiberglass-clad steel tanks. However, this comment, from a fiberglass-centered trade organization, does not provide information on the performance of this coating.

Regarding the comments that monitoring of cathodic protection systems should be performed annually and that it should be done by a qualified corrosion engineer, the Agency notes that its inquiry is limited to STI's request to relax the monitoring requirements, the Tillinghast report, and the Notice of Data Availability; a request for strengthening requirements is outside the scope of the current discussion. In any event, the Agency disagrees with these comments on two counts. First, the Agency believes that the 3-year interval remains appropriate for the same reasons discussed in the preamble to the final technical rule, which stated, "the Agency is now requiring in the final rule that all cathodic protection systems be tested within 6 months of installation and at least every 3 years thereafter. These intervals are sufficient to detect any damage or failure of the system and to take remedial action in time to prevent structural failures due to corrosion." See 53 Fed. Reg. 37137 (1988).

Second, the Agency still believes in the soundness of its decision not to require that cathodic protection monitoring be conducted solely by corrosion experts. As discussed in the preamble to the final rule (see 58 Fed. Reg. 37136 (1988)), in response to the Agency's proposal of such a requirement, some "commenters pointed out that the maintenance, operation, and inspection of an installed cathodic protection system could be performed by people who have much less training than a corrosion expert. EPA agrees with these comments, recognizing that most of these inspections are now being conducted by trained specialists." Comments received in response to this Notice of Data Availability present no data or arguments that cause the Agency to question this decision. While the Agency agrees with the Tillinghast report's finding that variability in cathodic protection readings is reduced through the use of better protocols, the Agency believes that requiring that the tester meet the definition of corrosion expert may lead to increased costs without increasing the protection of human health and the environment.

The Agency has examined commonly accepted industry standards for monitoring of cathodic protection systems on underground storage tanks and pipelines. The Agency found that many nationally held standards are more stringent. This lends further support to EPA's decision not to relax the current requirements.

The Agency disagrees with suggestions of monitoring intervals of five or 10 years instead of the current three years; these significantly longer intervals may allow steel tanks whose cathodic protection systems are not functioning properly to suffer external corrosion and leak. The Agency notes that the pace of external corrosion is highly dependent on characteristics of the metal structure and also of the surrounding soil, which vary widely. The Agency also finds the suggestion of extending the monitoring schedule on a case-by-case basis based on past monitoring non-persuasive. This is because of the additional risk of external corrosion should the cathodic protection system not continue to function properly, and also because it would be difficult for owners and operators and for regulatory personnel to keep track of the various individual schedules and to ascertain the compliance status of each tank. Similarly, the Agency agrees with the commenter who believes that an exemption for only sti-P3® tanks, versus all cathodically protected steel tanks, would make it difficult to determine which tanks required monitoring and which did not.

Regarding the comment on cathodic protection monitoring of steel piping, the Agency agrees that pipes are often the source of UST releases, but notes that this is outside the scope of both the Tillinghast report and the Notice of Data Availability.

The Agency agrees that anodes do have finite life spans, and notes that life spans are highly dependent on particular site conditions. The Agency also agrees that the end of anode life is one of the conditions that causes monitoring results to not meet the industry standard for verifying cathodic protection. Appropriate action to determine the cause or causes of such non-compliant results should be taken.

Based in part on the relative youth of the sti-P3® tank population and the stricter requirements of several national standards, the Agency believes that the current requirement for monitoring of sti-P3® cathodic protection systems should not be relaxed.

1.1 Changing the Tank Design Standards and Associated Monitoring Requirements

One commenter (State of Missouri, Department of Natural Resources) feels that rather than defer cathodic protection testing, a more appropriate approach might be to expand the rule to require periodic testing of all types of tanks to ensure continued performance of critical design parameters within specifications on an annual basis. This commenter suggests several requirements, including testing clad USTs to ensure electrical isolation of the inner steel tank from the surrounding soil, periodic diameter measurements of FRP tanks, and periodic testing of the inner coating of FRP products.

Another commenter (ASTSWMO) feels that monitoring other tank systems, in addition to maintaining the current requirements, should be considered.

One commenter (KCL Projects, Ltd.) stated that there is a risk of external corrosion with fiberglass-clad steel tanks. This commenter indicated that fractures occur when tanks are dropped or dented during installation, or from stresses resulting from the differences in the coefficients of thermal expansion between steel and fiberglass. This commenter did not, however, offer a recommendation for additional Agency action with regard to these tanks.

This commenter (KCL Projects Ltd.) also stated that coated tanks approved by Underwriters Laboratory, such as "subject 1746" tanks, have never been required to meet the same strength or corrosion-resistance standards as non-metallic underground tanks, and therefore cannot be assumed to offer the same corrosion protection as non-metallic tanks. This commenter argued that the Agency should require that every new UST meet UL standards for Class 16 tanks (nonmetallic units with secondary containment).

Response

These comments are outside the scope of the Agency's request for comments in the Notice of Data Availability. The Agency explicitly limited its request to the Tillinghast report and to external corrosion on cathodically protected steel tanks.

In any event, the Agency currently does not have sufficient information to support a change in the monitoring requirements for other tank technologies at this time. The Agency does not agree that requiring every new UST to meet UL standards for Class 16 tanks (nonmetallic units with secondary containment) is necessary to guard against releases.

New steel systems with ongoing corrosion protection, including cathodic protection, were allowed in EPA's technical rules because such systems have been shown to provide protection from galvanic corrosion, a major cause of failure in USTs. None of the above comments cause the Agency to question the conclusions in the final technical rules. The Agency believes that proper use and monitoring of cathodic protection systems adequately protects human health and the environment.

1.2 Installation Errors Necessitate Monitoring

1.2.1 General Installation Errors. Several commenters (KCL Projects Ltd.; Owens-Corning Fiberglass Corporation) argued that there is a risk of external corrosion with sti-P3® tanks. They stated that there is no way to locate fractures in the external coating surrounding the steel tank. These fractures occur when tanks are dropped or dented during installation, damaged during shipping, or damaged by improper backfill support or other improper installation methods. Once the external coating has fractured, it can peel away from the steel, exposing the steel to the environment and increasing the likelihood of external corrosion by creating an opportunity for accelerated point corrosion. Therefore, they concluded that the sti-P3® tank design does not provide absolute protection against external corrosion, and that cathodic protection systems should be used and monitoring should be conducted regularly to ensure that the systems are working properly.

One commenter (Owens-Corning Fiberglass Corporation) implied that monitoring of cathodic protection systems should always be required. The commenter noted, however, that if monitoring of the anodes was no longer to be required for sti-P3® tanks, the Agency should consider additional restrictions to ensure that the tank coating is not compromised prior to or during installation. The commenter proposed that the Agency require (1) spark testing at the jobsite to detect damage resulting from manufacturing defects and shipping, (2) the use of "self compacting" gravel backfill that will keep the tank from slumping and cracking, and (3) integrity testing of the coating.

One commenter (STICO [Steel Tank Insurance Company]) states that it knows of five external corrosion failures of sti-P3® tanks, and that the tanks all shared the characteristics of improper installation and a lack of monitoring. STICO believes these failures would have been prevented by proper testing at the time of installation. This commenter believes that, if properly installed and monitored, sti-P3® tanks provide long-term corrosion protection.

Many commenters (International Association of Tank Testing Professionals; New York State Department of Environmental Conservation; ASTSWMO; Corrosion Associates, Inc.; State of Michigan, Department of State Police; Letter to David Ziegele from Anonymous; STICO; Pump Masters Inc.; Charles A. Frey; Brown-Minneapolis Tank; Highland Tank & Manufacturing Company #7; Green Environmental & Corrosion Inc.; Northeast Utilities Service Company) stated that failures of sti-P3® tanks result from improper installation practices that violate the integrity of the cathodic protection system, and that damage to the cathodic protection system is difficult or impossible to detect at installation. One of these commenters (International Association of Tank Testing Professionals) cited specific examples of compromise to the cathodic protection system, including damage to external dielectric coating materials; failure to remove protective covers from anodes; contacts with piping and other objects during installation; and damage to anodes or insulating bushings. These failures would be detected if proper installation practices and follow-up cathodic protection system monitoring were employed.

One of these commenters (Highland Tank & Manufacturing Company #7) suggested that monitoring at installation would avoid potentially litigious situations in which the installation is complete and the owner must get the installer to correct what is now an expensive problem. Sometimes the hassle of these situations leads the owner to ignore the problem. Two of these commenters (Pump Masters, Inc.; Brown-Minneapolis Tank) suggested that the cathodic protection system be monitored at the time of installation and any time an excavation is disturbed by construction or retrofit activity, and another commenter (Charles A. Frey) suggested monitoring the cathodic protection system within six weeks of installation. One commenter (Corrosion Associated, Inc.) stated that monitoring should be conducted one year after installation.

One of these commenters (Northeast Utilities Service Company) notes that even when installations are performed properly, cathodic protection systems are often damaged during backfilling and post-installation work. The commenter suggests that if the Agency removes the periodic monitoring requirement but requires monitoring after installation, the cathodic protection system should be monitored after (1) backfilling, (2) application of final grade, and (3) installation of all surface structures.

Response

The Agency agrees with commenters who note that problems can result and have resulted from improper installation of sti-P3® tanks. Information from many sources, including the Tillinghast report, indicates that, although documented cases of sti-P3® tank failure due to external corrosion may be infrequent, when such failures occur they can usually be attributed to installation errors. However, again because of the relative youth of sti-P3® tanks, the Agency does not believe that this means that causes of external corrosion other than installation errors are not possible. In addition, while problems due to installation errors may be likely to be revealed soon after installation, if there are problems due to causes materializing after installation, they will come to light later, because the causes occurred later. This, together with the youth of sti-P3® tanks relative to their expected service life, leads the Agency to believe that the fact that most problems to date are from installation errors does not mean that any problems in the future also will be.

The Agency understands that some tank owners or installers perform cathodic protection monitoring at installation. The Agency believes that this is a sound engineering practice that can be of benefit to tank owners and, of course, one that meets the requirements in EPA's regulation that systems be tested within six months of installation. The Agency believes its current requirement to monitor the cathodic protection system within six months of installation is sufficient to detect a lack of cathodic protection before external corrosion causes premature failure. The Agency believes that the reasoning in the Preamble to the final technical rule, at 53 Fed. Reg. 37137 (1988) remains sound, as it states "the Agency is now requiring in the final rule that all cathodic protection systems be tested within 6 months of installation and at least every 3 years thereafter. These intervals are sufficient to detect any damage or failure of the system and to take remedial action in time to prevent structural failures due to corrosion."

The Agency believes that cathodic protection monitoring performed at the current frequency is sufficient, and therefore does not need to be enhanced to require monitoring at installation.

1.2.2 Pre-engineered Cathodic Protection Systems and Installation of Anodes. Several commenters (Piping and Corrosion Specialties Inc.; Chem Met, Ltd., P.C.) state that a cathodic protection system must be designed for the actual conditions where it will be used in order to function properly. The standard, factory-installed cathodic protection systems furnished by the Steel Tank Institute manufacturers are not designed for specific job conditions. The commenters feel that a standard design will not work in every location where it could be installed. One of these commenters (Chem Met, Ltd., P.C.) feels that a longer monitoring interval may not be acceptable in all such cases.

Another commenter (Corrosion Control Specialist Inc.) stated that he has tested many sti-P3® tanks that have pre-engineered cathodic protection systems. According to this commenter, not one tank has been fully cathodically protected without needing to add anodes to the pre-engineered system. The commenter reports that pre-engineered cathodic protection systems may not meet the specific conditions at a site, such as soil resistivity. The commenter stated that although the sti-P3® tank has an excellent coating system, the failure to monitor for corrosion could eventually lead to a tank failure.

Another commenter (Fiberglass Petroleum Tank & Pipe Institute) notes that the sti-P3® system is manufactured and sold for universal application. The commenter notes that many corrosion engineers advocate a corrosion survey of the tank installation site before the cathodic protection system is installed in order to insure that the proper anode and coating materials will be used. The commenter cites the Underwriters Laboratories standard UL 1746 as evidence that Underwriters Laboratories recognizes that a standard pre-engineered cathodic protection system should not be installed in all soil conditions. The commenter concludes by noting that about half of the soil in the United States is corrosive, having a 4,000 ohm-cm reading, and implies that the standard sti-P3® tank can not successfully work in such soil. Therefore, the commenter feels that the Agency should mandate a six-month monitoring interval for sti-P3® tanks in soil of 4,000 ohm-cm resistivity.

One of these commenters (Piping and Corrosion Specialties Inc.) states that the Steel Tank Institute has never used National Association of Corrosion Engineers recommendations in the design, installation, and testing of their pre-engineered cathodic protection systems. The commenter notes that the life expectancies of cathodic protection systems can vary from a few years to several years. The commenter concludes that periodic testing would be the only way to confirm that the system is operating properly.

One commenter (Owens-Corning Fiberglass Corporation) submitted a report from Harco Technologies showing that sti-P3® tanks built in the last four years are made with zinc anodes, which are weaker than magnesium anodes. The report notes that the zinc anodes are not field tested, and that much of the successful history of the sti-P3® tank is based upon the performance of magnesium anodes in use on older models.

Several commenters (State of Maryland, Maryland Department of the Environment; Piping and Corrosion Specialties Inc.) noted that sti-P3® tanks are generally constructed with anodes made of either zinc or magnesium. These commenters expressed concern that installation sites are rarely checked for soil resistivity, the main factor that determines which type of anode should be used on the tank. The commenters noted that when anodes are installed in an improper environment, they might initially provide protection, but shortly thereafter they may not be useful. The commenters provided the example of a magnesium anode that is installed in an environment with low soil resistivity, an environment in which a zinc anode would be more appropriate. The magnesium anode would be used up rapidly due to self-corrosion, leaving the tank unprotected. The commenters also noted that zinc anodes in an environment with high soil resistivity will only provide adequate protection while the coating surrounding the anode is present. Once the coating breaks down, the anode cannot supply protective current and the tank corrodes. The commenters concluded that cathodic protection testing should be continued to provide a warning when anodes cease to be effective.

One commenter (Corrosion Associates, Inc.) notes that almost all of the tanks that he has observed being installed have been equipped with zinc anodes and backfilled with clean sand or pea gravel, which are high resistivity media. The commenter notes that some of these tanks lose protective potential after a few years, and he believes this is due to passivation of the zinc anode. The cost of excavation to prove that this is the case is prohibitive, so often additional magnesium anodes are drilled in to raise the potential to protective levels. The commenter feels that this is an added expense that would not have been necessary had magnesium anodes been used in the first place.

Response

The Agency agrees that various combinations of site conditions and anode materials exist at sti-P3® installations and at installations of other tanks with factory installed cathodic protection systems. The Agency agrees with those commenters who recommend periodic cathodic protection monitoring as the best way to measure protection against external corrosion at any site regardless of site conditions. The Agency also notes that efforts to determine the proper type of anode to use for particular site conditions, such as pre-installation corrosion surveys, have been performed at sti-P3® installations.

With regard to the commenter who feels that the Agency should mandate a six-month monitoring interval for sti-P3® tanks in soils of a certain resistivity, the Agency notes that requests to increase the stringency of the monitoring requirement are outside the scope of STI's request, the Tillinghast study, and the Notice of Data Availability. In any event, the Agency disagrees with the commenter. The Agency still holds the beliefs found in the Preamble to the final technical rule at 53 Fed. Reg. 37126 (1988), which reads, "EPA continues to believe that use of a single resistivity variable is inadequate to measure the propensity to corrode." The Agency believes, as stated above, that the three year interval allows sufficient time to take remedial action in order to prevent failure.

The Agency acknowledges that the sti-P3® tank design for cathodic protection is a conservative one, intended to work in a wide variety of conditions. However, the Agency agrees with commenters who report that anodes can be utilized that may not be appropriate for all specific site conditions. In addition, the anode selection and design specifications for factory installed cathodic protection systems that were not manufactured to the sti-P3® specification are not known.

Therefore, the Agency believes that variation in site conditions and the potential for the selection of inappropriate anodes for the cathodic protection system warrant periodic cathodic protection monitoring of sti-P3® tanks. The Agency believes that this requirement is equally appropriate for the less-understood, non-sti-P3® cathodically protected steel tanks as well.

1.3 Changing Site Conditions Necessitate Monitoring

Another commenter (Government of the District of Columbia, Environmental Regulations Administration) noted that anodes corrode in the process of generating protective current. Generally, an adequately designed anode requires no monitoring in the early years of service, provided that the cathodic protection system is checked at installation and there are no structural disturbances during the course of its operation. As the system gets older than 15 years, monitoring is advisable. Another commenter (Electrochemical Devices, Inc.) also noted that where environmental conditions are constant and cathodic protection is maintained, tank potentials will not vary for the life of the anode. This commenter felt that it might be acceptable to relax the frequency of the monitoring requirement, although he felt that in general monitoring was a valuable practice and should be continued.

Several commenters (Xerxes Corporation; NACE International; Northeast Utilities Service Company; New York State Department of Environmental Conservation) argued that changing site conditions justify frequent monitoring. One of these commenters (Xerxes Corporation) states that underground conditions constantly change. Corrosion rates rise and fall as water passes in and out of an area, and the addition of power lines, new buildings and underground piping near a tank location can create disturbances that damage cathodic protection systems. This commenter stated that the typical owner may not be aware of these disturbances, or the damage that they may cause to the corrosion system. The commenter believes that the frequency of the monitoring requirement ensures that any compromise in the protection system will be detected in a timely manner.

Another commenter (NACE International) states that there are some specific reasons to require periodic testing of the cathodic protection system. Those reasons are: (1) changes in UST configuration; (2) electrical changes such as stray current/interference, shorts to other structures, wires cut or damaged, and anodes consumed; (3) environmental changes such as drainage, earthquakes, settlement, and pollution/contamination; and (4) nearby effects such as new construction and utility changes or additions.

One commenter (Northeast Utilities Service Company) notes that operators of facilities do not always inform parties that monitor cathodic protection systems that a tank has been disturbed so that they may initiate testing after the disturbance. Under the current regulatory schedule, problems of this nature are identified during the next cathodic protection monitoring. Without a periodic monitoring requirement, problems caused by disturbances may go unnoticed and lead to possible releases to the environment.

One commenter (New York State Department of Environmental Conservation) noted that the Tillinghast report cites an incident of sti-P3® tank failure as a result of a massive stray current that overpowered the anode. The commenter notes that although the Tillinghast report attributes most corrosion failures to installation damage or excavation disturbances, in this case the report does not mention any excavation disturbance associated with the incident. This commenter concluded that monitoring of the cathodic protection system would have detected the situation so the owner or operator could have taken steps to protect the tank before it corroded and failed.

Response

The Agency believes that the likelihood of changing site conditions surrounding an UST system warrants regular cathodic protection monitoring by the owner or operator. Owners and operators may not be aware of every occasion when the site conditions surrounding an UST, or a group of USTs, have been disturbed. Site conditions, and their effects on an underground structure's corrosion protection, change for many reasons. These include heavy rainfall that can increase soil moisture and therefore the likelihood for external corrosion. Also relevant are nearby construction activities that can disturb the soil, leading to accelerated corrosion due to less homogeneous tank backfill. Construction also can short circuit other metal structures to the tank. In this case, anodes, as they protect more exposed metal, will not last as long as they would otherwise, potentially leading to external corrosion where none would otherwise occur. In addition, electrical changes, such as stray currents from electrical utility lines or changes in nearby impressed current cathodic protection systems, can render a cathodic protection system less effective.

If the owner or operator does not realize that conditions surrounding the USTs have changed, the USTs can become more vulnerable to corrosion and the possibility of a leak. The Agency believes that owners or operators will know when some changes occur, including most construction activity disturbing the backfill, but also believes that there are many opportunities for site conditions to change without the owner or operator realizing the change has taken place. Furthermore, the Agency believes that, without a schedule, some owners and operators will, even if they realize changes have taken place, not properly monitor the cathodic protection system to ensure it is still functioning properly.

Because so many factors that can impact the cathodic protection system are beyond the control of and can occur without the knowledge of UST owners and operators, it is not feasible to rely on owner and operator discretion to determine the appropriate intervals for monitoring a cathodic protection system. The Agency believes that the current monitoring frequency allows owners and operators to detect changes in the UST environment that can compromise cathodic protection systems and to take timely and appropriate actions to protect those systems. Finally, the Agency believes it would be difficult for implementing agencies to monitor compliance with, and enforce, a requirement to monitor only after site conditions have changed due to construction or another disturbance of the tank excavation.

1.4 Specific Tank Data Provided

1.4.1 Data on Cathodic Protection Systems. Several commenters (Owens-Corning Fiberglass Corporation; Fiberglass Petroleum Tank & Pipe Institute) cited a study that was conducted from 1980 to 1983 by the PSG/Hinchman Company for Owens-Corning Fiberglass Corporation. In this study, 76 sti-P3® tanks were tested in four states, and measurements were made relative to the well-established industry standard criterion of a negative potential voltage of at least 0.85 volt (-0.85 volt), as measured between the structure and a saturated copper-copper sulfate half-cell contacting the soil. The Hinchman Company found that although 63 (83%) of the 76 tanks were adequately protected from external corrosion failures, eight (10%) tanks did not meet the selected criterion for cathodic protection because their insulating bushings were shorted, and five (7%) tanks did not meet the selected criterion for cathodic protection for unspecified reasons. These commenters also cited a report (The Geyer Report) that documents the results of surveys conducted by the Steel Tank Institute during 1986. Data from this report indicate that 22%[2] of 591 tanks surveyed and tested did not meet the industry standard -0.85 volt criterion, as required in National Association of Corrosion Engineers' Recommended Practice RP-02-85.

Another commenter (State of Missouri, Department of Natural Resources) reports that it has inspection records for 1,962 USTs. Six of these inspections specifically identified noncompliance with the corrosion protection requirements. Five of these six records covered facilities that are believed, based on registration data, to be sti-P3® USTs. Five of these six records indicate that the initial violation was the owner's or operator's failure to test the cathodic protection system. Three of the six records provide test results indicating that cathodic protection systems were not operating properly.

Another commenter (State of Maryland, Maryland Department of the Environment) noted that several corrosion protection companies that test hundreds of tanks per year across the country report an almost 80% failure rate of cathodic protection systems when checked against the -0.85 volt criterion. (The commenter did not state whether the tanks examined were sti-P3® tanks.) This failure rate implies that most cathodically protected tanks are not adequately protected against corrosion, and that continued monitoring is the only way to detect likely problems with the tanks.

Another commenter (Green Environmental & Corrosion, Inc.) notes that her firm tests a significant number of cathodic protection systems every year. Based on their results, over 60% of sti-P3® systems do not meet the criteria for cathodic protection. One commenter (Letter to David Ziegele from Anonymous) notes that he is aware of single wall sti-P3® tanks originally sold by his company and others that are not cathodically protected and cannot pass a precision test.

Another commenter (Beth Anderson) questions the reliability of sti-P3® tanks that have been in the ground for 20 years or more. The commenter reports seeing significant depletion on some cathodic protection systems (i.e., the anode) after 15 to 20 years of service. The commenter notes that in these instances there was no corrosion damage on the tank, but that the anodes had been replaced to provide better long-term protection. The commenter feels that failure to replace the anodes would have put the tanks at risk of corroding.

One commenter (ASTSWMO) notes that the Tillinghast report says that less than 10% of the Watchdog participants of major oil companies who maintain their corrosion monitoring programs and installed sti-P3® tanks in 1990 reported readings below the -0.85 volt criterion. The commenter expresses concern that these tanks are only three to four years old, and that as many as one in ten are out of compliance with acceptable levels for corrosion protection. The commenter notes that these substandard test levels may be due to factors other than anode failure, but feels that periodic monitoring of the cathodic protection system would indicate the need for further investigation to determine the cause of the substandard readings.

1.4.2 Data on sti-P3® Tanks. Several commenters (Fargo Tank Company; Pump Masters Inc.; Highland Tank & Manufacturing Company # 13, #12, and #10; E.E. Wine Inc.) described their experiences with the removal and inspection of sti-P3® tanks. One of these commenters (Fargo Tank Company) described four sti-P3® tanks that had been in the ground for more than six years. This commenter reported that the four tanks showed no internal or external corrosion, pitting or scratching. Another commenter (Pump Masters, Inc.) described two sti-P3® tanks that had been in the ground for 12 and 14 years respectively. The exterior coatings on the tanks appeared to be in very good condition, with no evidence of peeling or deterioration. Several commenters (Highland Tank & Manufacturing Company #13; Highland Tank & Manufacturing Company #12) described the condition of several sti-P3® tanks removed after seven and ten years in the ground by saying that they looked like the day they were installed. Another commenter (Highland Tank & Manufacturing Company #10) described the condition of an 8,000 gallon, five-year-old sti-P3® tank. The tank had some scratches in its coating and a light gray film covering on the area of the scratches. The commenter said the gray film was the action of the anodes working to protect the scratches and therefore to protect against corrosion. Another commenter (E.E. Wine, Inc.) excavated to the top of an sti-P3® tank that had been buried for seven years, and noted that the tank was in good condition.

Several other commenters (James B. Phillips Company, Inc.; Beaver Petroleum Co. Inc; Crawford Fuel and Oil; Bell Petroleum Ltd., Aviation Products Division; Fred's Plumbing and Heating #1; Fred's Plumbing and Heating #2; Sammy L. Thorlup; Benit Fuel Sales & Service Inc.; Highland Tank & Manufacturing Company #8; Alliance Oil Service Company; Baird Petroleum Equipment Corporation; James Islintu) described sti-P3® tanks based on visual observation during removal. Although the commenters did not provide the ages of the tanks, they reported that the tanks showed no evidence of corrosion, and that in some cases original labelling and stencilling were still legible on the external tank surfaces.

Many commenters[3] stated that the sti-P3® tank is an extremely reliable tank. These commenters stated that based on their experience with installing or using sti-P3® tanks, they knew of few or no problems associated with the tanks. These commenters stated that of the more than 200,000 sti-P3® tanks that have been installed, there have been only seven reported failures. One of these commenters (Highland Tank & Manufacturing Company #2) stated that although more than 200,000 sti-P3® tanks have been installed, he only knew of one reported product release from an sti-P3® tank.

One commenter (Brown-Minneapolis Tank) stated that the Tillinghast report mentions only two failures out of the 8,000 sti-P3® tanks included in its sample. The failures of these tanks were due to improper installation and not the tanks themselves.

One commenter (STICO) states that based upon actuarial assessments, the sti-P3® tank has the lowest insurance premium rate as a result of its comparatively low risk exposure -- less than 1/10 of 1% of all sti-P3® tanks fail. He acknowledges that this low risk exposure is due largely to compliance with the cathodic protection monitoring requirement to monitor within six months of installation. He reports that he knows of five external corrosion failures of tanks, and that they all shared characteristics -- improper installation and a lack of monitoring on the part of the owner/operator -- which he believes could have been prevented by proper testing at the time of installation. He believes that sti-P3® tanks provide long-term corrosion protection.

Another commenter (Green Environmental & Corrosion, Inc.) notes that the Steel Tank Institute Watchdog Program was finding a large number of non-compliant cathodic protection readings. According to the commenter, this lowered owners' faith in the system, which in turn reduced the number of sti-P3® tanks sold.

Response

In response to concerns about internal corrosion, the Agency points out that the Tillinghast report, like external cathodic protection systems, addresses only external corrosion. In addition, the Agency's information is that internal corrosion of steel tanks historically poses a much smaller risk of release than external corrosion.

The Agency believes that commenters who cited the Geyer Report as indicating that 22% of 591 tanks surveyed and tested did not meet the -0.85 volt criterion misinterpreted the report's findings. Tables 2 and 3 of the Geyer Report show a finding that 10 or 11%, not 22%, of the universe of 591 tanks surveyed were below the -0.85 volt protection criterion.

The Agency notes that the -0.85 volt potential cathodic protection criterion is a conservative one that has been documented over many years as providing protection of steel in a wide variety of conditions. Furthermore, the Agency is aware that site conditions such as extreme backfill dryness, which renders neither the tank nor the anodes cathodically active, can cause non-compliant readings. Therefore, readings more positive than -0.85 volts do not necessarily indicate that a tank is corroding. The Agency notes that several commenters provided data indicating that a significant fraction of cathodic protection monitoring is not able to show that the systems monitored are, with certainty, meeting industry standards. However, the criterion is a well-established industry standard, and its use is a certain and efficient way to determine that a tank has cathodic protection. When cathodic protection systems do not meet this criterion, owners and operators should investigate the cause of the failure in order to be able to achieve the standard. The Agency believes that the current cathodic protection monitoring requirements of monitoring within six months of installation and at least every three years afterward are adequate and detect potential failures of cathodic protection systems.

In response to comments on sti-P3® tanks, the Agency acknowledges that many experienced professionals believe in their reliability. However, few commenters provided data covering a large number of tanks. These comments do not compel the Agency to reduce the required frequency of cathodic protection monitoring, due largely to a lack of adequate data and to the youth of the population of sti-P3® tanks relative to their expected useful life.

2. Validity of Tillinghast Report

A commenter (State of Michigan, Department of State Police) states that the Tillinghast report is based on a sample that contains a disproportionate number of tanks that were installed after promulgation of the UST rules. This sample, therefore, does not provide sufficient data for identifying the ideal monitoring schedule. The commenter feels that without additional data, there is not adequate evidence to support any change in the monitoring requirements.

Several commenters (Xerxes Corporation; Piping and Corrosion Specialties Inc.) believe that there is no statistically reliable data to either affirm or refute the Steel Tank Institute's assertion that the sti-P3® tank has a very good performance record. One commenter (Xerxes Corporation) notes that much of the information in the report is based on anecdotal information provided by people who are not aware of the limits of their knowledge. To be statistically valid, the survey would need to have a broader population and look at tanks in different soil conditions and of different ages. This commenter also notes that the survey is full of assumptions, uncertainties, and admissions of deficiencies.The other commenter (Piping and Corrosion Specialties Inc.) noted that some of the conclusions in the Tillinghast report are suspect. Specifically, this commenter notes that the report included only 110 owners who had direct knowledge of 385 tanks and secondary knowledge of 2,500 tanks, and 37 installers who had knowledge of 5,000 tanks. The report stated that the cathodic protection requirements are not well understood by many owners, installers and regulators, and that monitoring of the cathodic protection system was generally not being performed. This commenter questions how Tillinghast therefore can conclude that sti-P3® tanks do not need to be monitored when many of those surveyed were not monitoring or did not understand the cathodic protection systems.

Another commenter (Green Environmental & Corrosion, Inc.) contends that the Tillinghast report is not authoritative. The commenter believes that the Tillinghast report is extremely limited for the purpose of rewriting a federal regulation, and that significantly more information should be obtained. The commenter further notes that the owners of the tanks surveyed were under the Steel Tank Institute Watchdog Program, and, because they receive test results under the program, knew the condition of the cathodic protection systems prior to the survey. They would have been informed of the failure of the cathodic protection systems and would have taken preemptive measures to avoid damage to their tanks.

One commenter (Green Environmental & Corrosion, Inc.) stated that the small number of insurance claims against STICO for sti-P3® tank failures is not a valid indicator of the rate of sti-P3® tanks failures. This commenter argued that the numbers would not be valid because many owners would first proceed to their respective state insurance funds for coverage in the event of a failure and because in some cases STICO has refused to honor claims made against it due to what it called contractor negligence.

One commenter (Fiberglass Petroleum Tank & Pipe Institute) says that the Tillinghast report is biased by geographic tank distribution. For example, the sample did not include any tanks from the midwest (Region 5) and only 1.7% of the tanks selected were located in the northeast (Regions 1 & 2). The majority of the tanks in the sample (50.9%) were located in

EPA Regions 6, 7 & 8. The commenter further noted that the geographic areas chosen for the sample are not known to be areas where corrosive soils and stray currents are typically found in UST settings. The commenter argued that a representative sample should have included such states as Ohio where cathodic protection has been problematic due to low soil resistivity and New Jersey where most USTs are installed in urban settings subject to stray currents. In sum, the commenter feels that the Tillinghast report sample selection is biased towards sti-P3® tank locations in the most favorable soil conditions. The commenter notes, however, that even in these favorable settings the Tillinghast report shows an unacceptable level of cathodic protection for many sti-P3® tanks.

This commenter (Fiberglass Petroleum Tank & Pipe Institute) also stated that the Tillinghast contacts were not appropriate because they could only produce anecdotal information. This commenter argues that interviewing installers was inappropriate because it was in the installers' best interest not to identify problems with their installations. The commenter further noted that only 11 of the 37 installers interviewed had experience with sti-P3® tank removals. This commenter also questions the validity of interviews with major oil company representatives. Although not identified in the Tillinghast report, this commenter believes these major oil companies had to be Exxon, Chevron, Shell, Texaco, Mobil and ARCO. This commenter noted that these companies are all FRP tank users and have only incidental experience with sti-P3® tanks. The commenter indicated that while Amoco could also have provided comments, this company has discontinued the use of sti-P3® tanks and therefore the commenter believes that Tillinghast would not have interviewed them for this report. Finally, this commenter noted that the only other company that could have been included is Marathon, which is owned by USX, a steel producer. This commenter argued that Marathon's comments would therefore be biased in favor of sti-P3® tanks.

One commenter (Letter to David Ziegele from Anonymous) feels that the only way to know the truth about sti-P3® tanks is to depose every sti-P3® tank manufacturer under oath and survey every owner of a cathodically protected UST.

Response

The Agency acknowledges the comments regarding the validity of the Tillinghast Report. In its decisionmaking process, the Agency has evaluated and considered the data and information presented in that report and all other information submitted to the docket as of the end of January, 1994, on their own merits.

The Agency notes that the Tillinghast report is the most comprehensive of its kind to date, and includes both "hard" data, such as that from the Steel Tank Insurance Company (STICO), as well as "soft" data, such as estimates from installers and regulators. The Agency agrees with the comment that the report is based on a sample that contains a disproportionate number of tanks that were installed after promulgation of the UST rules in 1988. This may well be because the vast majority of sti-P3® tanks have been installed since 1985, making older sti-P3® tanks and information about them rare. The Agency further agrees with this commenter that without such data, there is not adequate evidence to support any change in the monitoring frequency requirement. The Agency notes that data of this nature may not be available for several years, due to the youth of installed sti-P3® tanks relative to their expected service life *and relative to their current warranty period of 30 years. Even though age is by no means the sole indicator of tank integrity, corrosion is progressive and the Agency believes that the fact that relatively few older tanks were surveyed skews the applicability of the report's findings to the subject of STI's request.*

The Agency acknowledges the report's findings that there have been very few recorded failures of sti-P3® tanks, but acknowledges the commenters who stated that no statistically reliable data was included to affirm the claim that the sti-P3® tank has a very good performance record to date. The Agency again notes the lack of data from older sti-P3® tanks.

The Agency agrees with the comment noting that much of the information in the report is anecdotal, and that many of the people providing the information appear to have little technical knowledge of cathodic protection. The Agency believes that the findings obtained from these sources are therefore less persuasive than if respondents demonstrated a high level of technical competence. The Agency agrees with the comment that the report does have definite limitations, some of which are stated in the report itself. For example, the report notes that the actual numbers of tanks owned or installed by survey participants could be 50% higher or lower; thus, Tillinghast rightfully could not state with reasonable certainty that all instances of external corrosion of sti-P3® tanks were identified, and also could not state with certainty that the instances that were identified involved sti-P3® tanks.

The Agency also agrees with one commenter that the report noted that cathodic protection monitoring is frequently not performed, and therefore any conclusion that sti-P3® tanks do not need to be monitored is questionable. Furthermore, the Agency agrees with this commenter that the tank owners surveyed in the Tillinghast report that were covered by STI's Watchdog program are more likely to know the condition of their cathodic protection systems and to have taken remedial steps in the event of noncompliant readings. Finally, EPA believes that this commenter's assertion that the number of claims against STICO is not a valid indicator of sti-P3® failures is plausible, partly because a large majority of states have funds available for addressing leaks. The Agency cannot speak to the comment regarding honoring claims and alleged contractor negligence.

The Agency acknowledges one commenter's claim of geographical bias, and agrees with this commenter that the Tillinghast report shows that several percent of sti-P3® tanks tested are not shown to meet industry standards for cathodic protection. Regarding the interviews of installers, the Agency agrees with this commenter that the report shows only 11 out of 37 installers interviewed had experience with sti-P3® removals, and believes that information on tank condition at removal is very important with regard to external corrosion.

The Agency agrees with commenters that some of the sources of information in the Tillinghast report are not financially independent of the success of sti-P3® tanks, but also notes that this is true of several of the commenters. The Agency has taken into consideration the apparent interests of those providing information as appropriate.

In response to the anonymous commenter who felt that the only way to know the truth about sti-P3® tanks was to depose all sti-P3® manufacturers under oath and survey all *owners of cathodically protected tanks, the Agency believes that such activities would be very resource intensive and impractical. However, the Agency acknowledges that the more respondents are surveyed, the greater the level of confidence in the responses, and notes that the Tillinghast findings are based on surveys of only a small fraction of the installed sti-P3® tanks.*

The Agency acknowledges the report's findings that almost eight percent of tanks in the Watchdog program in recent years were not shown to be protected for one reason or another, though cathodic protection monitoring results are reported to be improving. The Agency also acknowledges the report's finding that, unless a tank is in the Watchdog program or maintained by a major oil company, cathodic protection monitoring is generally not being performed. The Agency also acknowledges that assessing the frequency of cathodic protection testing was not the primary purpose of the report, and that Tillinghast states that it did not obtain enough corrosion monitoring data to statistically determine an optimum monitoring frequency.

Consideration of the Tillinghast report and comments regarding it lead the Agency to believe that routine cathodic protection monitoring is necessary in determining whether or not steel tanks are protected from external corrosion, and should still be required.

3. Inequality of Rules - Applicability to Other Tanks

Several commenters (Highland Tank & Manufacturing Company #2, Ten Hoeve Brothers, Inc. #1) argue that the monitoring requirement is inappropriate because it is not placed on bare steel tanks and other technologies that are allegedly less proven than the sti-P3® tank.

Several commenters (Xerxes Corporation; Marcel Moreau Associates; State of Michigan, Department of State Police) argue that the cathodic protection monitoring requirement is not inconsistent with the phase-in schedule for existing UST systems. One of these commenters (Marcel Moreau Associates) states that the fact that sti-P3® tanks require cathodic protection monitoring and others do not should not be viewed as unfair. Rather, the fact that different requirements apply to different tanks should be accepted as part of the overall regulatory strategy used to ensure the safety of all UST systems by 1998. The commenter adds that sti-P3® tank distributors could use this argument as a selling point, promoting their tanks as better protected from leaks than are brands that do not have to adhere to the monitoring requirements. Another of these commenters (State of Michigan, Department of State Police) notes that the cathodic protection requirement for steel tanks is not indicative of a bias toward unprotected steel tanks. Rather, the 1998 phase-in of tank upgrade requirements is intended to minimize the financial burden on the regulated community for costs associated with upgrading UST systems. The other commenter (Xerxes Corporation) stated that although the requirements appear to be inequitable with older non-protected tanks, the commenter argues that the customer is paying for a better product when he buys a cathodically protected steel tank.

Several commenters (Xerxes Corporation; Marcel Moreau Associates; State of Michigan, Department of State Police) argue that because periodic monitoring of fiberglass tank diameters is not required is not a valid reason for eliminating the cathodic protection monitoring requirement for steel tanks. The commenters contend that the two types of tanks fail in different ways. Thus, requirements that may be appropriate for steel tanks may not be appropriate for fiberglass tanks. Another commenter (State of Michigan, Department of State Police) argues that, although the absence of tank deflection monitoring requirements for fiberglass-reinforced-plastic tanks supports a lack of tank deflection monitoring requirements for steel tanks, the absence of such a requirement does not justify eliminating the cathodic protection monitoring requirements for steel tanks.

Response

While it is true that cathodic protection monitoring is not required on bare steel tanks prior to December 22, 1998, this fact does not warrant relaxation of the requirements for cathodically protected steel tanks. The Agency believes that the discrepancy in requirements is appropriate. It would have been most environmentally protective to require immediate upgrading of bare steel tanks. However, the Agency still supports its original decision, made when the technical rule was promulgated in 1988, to allow owners of bare steel tanks until 1998 to meet these requirements. This decision was based on the Agency's conclusion that a shorter compliance period was not feasible, given the diverse nature and large size of the *regulated UST community. Because periodic cathodic protection monitoring of steel tanks that do not even have cathodic protection serves no purpose, and because, as stated elsewhere, cathodic protection monitoring is neither difficult nor expensive, the Agency believes that applying different standards is reasonable. Meanwhile, it is important for cathodically protected tanks to be monitored, to ensure that they are indeed protected, and to ensure that they do not add to the threat posed by existing bare steel tanks. The Agency also notes that bare steel tanks must be replaced or upgraded by December 22, 1998. Either of these tasks costs thousands of dollars. By contrast, tanks with pre-engineered cathodic protection monitoring systems (and spill and overfill equipment) need not be upgraded or replaced.*

Although the Agency defined a ten year compliance period for upgrading existing bare steel tank systems, it continues to be concerned about their potential impact on human health and the environment. The Agency notes that it and many state UST programs have encouraged owners and operators to upgrade their existing tank systems before the 1998 deadline and have seen some progress toward that end. Compliance with the monitoring requirements for those upgraded or replaced systems has greatly reduced the incidence of corrosion failure in steel tanks. Given the complex nature and size of the regulated community, the Agency believes that this combination of requirements has provided the greatest protection of human health and the environment.

In response to concerns about the inequality of the rule because it does not apply to fiberglass tanks, the Agency believes that tank wall deflection in fiberglass tanks is a fundamentally different physical phenomenon than external corrosion of steel tanks, both in its nature and in its likelihood to pose a threat to tank integrity over the long term. The materials used to construct different types of tanks vary and the Agency, in the technical standards promulgated in 1988, initially determined specific testing methods and frequency based on the risk posed by those materials. The Agency concedes that coated, cathodically protected steel tanks meeting the UST regulations pose orders of magnitude less risk of failure due to external corrosion than unprotected steel tanks. Nevertheless, the fact remains that steel, if its protection is compromised, is subject to long-term progressive deterioration by way of corrosion in a way that fiberglass-reinforced plastic is not. In the preamble to the proposed technical rule, The Agency noted that corrosion was the major cause of leaks from unprotected steel UST systems. See 52 Fed. Reg. 12666 (1987). The Agency believes that monitoring cathodic protection systems is necessary to ensure that cathodically protected steel systems remain protected, and that they do not in the future pose risks to human health and the environment similar to those the Agency found in the past. In addition, the Agency currently does not have information indicating that fiberglass tanks pose particular risks of failure over the long term or that imposing periodic monitoring of fiberglass tanks, such as deflection monitoring, would reduce risks to human health and the environment. Therefore, the Agency agrees with commenters who argued that the lack of monitoring of deflection in fiberglass tanks is not a valid reason to eliminate or reduce the monitoring requirement on steel tanks.

4. Duplication of Leak Detection Requirements

Several commenters[4] indicated that when properly used or installed, inventory control techniques and leak detection monitors provide notice of tank system failure and effectively reduce chances for spills of any consequence. These commenters stated that the cathodic protection monitoring requirement is redundant in light of these other requirements.

Several commenters (ASTSWMO; Marcel Moreau Associates; NACE International; State of Michigan, Department of State Police; Green Environmental & Corrosion, Inc.; State of Missouri, Department of Natural Resources), however, noted that leak detection monitoring and cathodic protection monitoring do not serve the same purpose. Leak detection monitoring provides notice of releases and environmental damage. Cathodic protection monitoring works as a means of leak prevention by providing notice of potential corrosion which could lead to leaks. These commenters, therefore, disagreed that the two systems are redundant, and argued that leak detection monitoring does not supersede the need for cathodic protection monitoring.

One of these commenters (ASTSWMO) noted that more resources are currently directed toward clean-up than to preventive measures. However, the commenter feels that the Agency's approach to the problem of leaking USTs is essentially correct as it addresses both ends of the tank problem -- using resources as needed to respond to leaks while developing requirements that focus on prevention.

Response

The Agency believes the current cathodic protection system monitoring requirements do not duplicate the leak detection requirements. Leak detection systems are designed to inform owners and operators when a leak in the UST system has already occurred. By contrast, cathodic protection systems are designed to prevent damage to USTs by warning owners and operators that their UST system or piping is no longer adequately protected and has become vulnerable to corrosion. Cathodic protection systems and the requirements for monitoring them are designed to reduce the likelihood that any release will occur and to prevent pollution; leak detection systems help to reduce the likelihood that a leak from an UST system will become significant, but are not designed to reduce the likelihood of a leak.

5. Ease and Costs of Compliance

5.1 Ease of Cathodic Protection Monitoring

One commenter (New York State Department of Environmental Conservation) indicated that it is easy to monitor cathodic protection systems. The commenter noted that once a system has been properly installed that provides access to the soil above the tank, the major problem to be expected is low soil moisture content. This condition can lead to incorrect or incomplete readings. The commenter suggested that this could be corrected by adding water to the soil and taking the reading again.

Another commenter (State of Missouri, Department of Natural Resources) noted that the problem with the current monitoring requirement is that the specified frequency differs from the frequency of other actions required under UST rules. This makes the requirement difficult to remember. Another commenter (Chem Met, Ltd., P.C.) notes that often there is a tendency to forget to monitor the cathodic protection system. The commenter feels that this tendency will become more prevalent if the monitoring schedule is extended.

Another commenter (New York State Department of Environmental Conservation) noted that the Tillinghast report states that many owners and installers do not understand the technical basis for cathodic protection. The commenter responded that a lack of education should not be a reason for eliminating the monitoring requirement. The commenter proposed that more education is needed to help people understand why tanks are protected and how to determine if protection is adequate. One commenter (Xerxes Corporation) notes that the Tillinghast report mentions the need for additional training for installers and customers.

A commenter (Piping and Corrosion Specialties Inc.) states that incorrect testing procedures could lead to inaccurate readings when the cathodic protection system is being monitored. The commenter worries that inaccurate readings may be obtained because the Steel Tank Institute does not have a technical report form which specifies the required location of the test electrode so that it will be in a proper location to avoid direct influence of the anodes on the test reading.

5.2 Cost of Cathodic Protection Testing

One commenter (Fargo Tank Company) noted that tank owners must hire a testing agency at extra cost to test the cathodic protection system, an unnecessarily expensive burden.

Several commenters (Cayuga Onondaga, Board of Cooperative Services; Owens-Corning Fiberglass Corporation; Green Environmental & Corrosion, Inc.) disagreed and stated that the actual costs of testing are minimal. One commenter (Cayuga Onondaga, Board of Cooperative Services) indicated that the cost of testing is approximately $95 per year. This commenter indicated that commercially available hand-held test meters cost $150-$200. The commenter noted that the time required to test either tank or piping is less than five minutes if test leads are available, 10-15 minutes each if a test probe or wire must be touched to the bottom of the tank. The commenter assumed that the cost for a laborer to inspect the tanks would be $20 per hour. The commenter thus calculated a cost of $95 per year for annual testing of a six-tank facility.

Another commenter (Owens-Corning Fiberglass Corporation) cited a report entitled "UST System Installation and Maintenance" by Wayne B. Geyer. The report notes that testing can be done with a simple and inexpensive voltmeter and requires only five minutes every three years.

Another commenter (Green Environmental & Corrosion, Inc.) reports that her firm tests over 300 sti-P3® tank sites per year. Her firm charges $200 per location, but has charged as little as $150 per location for clients with multiple sites. The commenter is aware of other firms that charge as little as $95 per location, which translates into an annual cost of $32 to $67 per location.

Another commenter (Northeast Utilities Service Company) states that the annual cost of cathodic protection monitoring is between $130 and $500. The commenter further states that in the past four years his company has experienced 27 releases, costing a total of over $4 million, an average of $150,000 per release. The commenter concludes that the cost/benefits analysis suggests that cathodic protection monitoring should be retained in some form. Two other commenters (Piping & Corrosion Specialties Inc.; ASTSWMO) report that the current monitoring requirement is a very inexpensive and cost-effective policy to prevent tank leaks and the high cost of remediating those leaks.

5.3 Costs of Cathodic Protection Monitoring Systems Affects Consumer Choices

One commenter (Brown-Minneapolis Tank) states that it will cost the industry billions of dollars to monitor sti-P3® tanks. Furthermore, the cost of monitoring an sti-P3® tank places this technology at an unfair disadvantage with other technologies that do not have a monitoring requirement, some of which have higher failure rates than sti-P3® tanks.[5]

Several commenters[6] indicate that when they inform their customers of the monitoring requirement for sti-P3® tanks, the customers choose other tanks -- including those that use experimental technologies with unproven track records -- because they do not want the burden of complying with the monitoring requirement. One commenter (Highland Tank & Manufacturing Company #3) reported that in order to remain competitive, his company is being forced to sell products without the proven cathodic protection system, a technology that most customers would prefer to have but are unwilling to purchase because of the monitoring requirement.

Another commenter (Highland Tank & Manufacturing Company #7) states that the regulations hurt sales of sti-P3® tanks because competitors have waged a marketing campaign stressing concern about the safety of sti-P3® tanks and implying that such concerns do not exist for the competition's tank. The commenter states that competitors use scare tactics to dissuade consumers from buying sti-P3® tanks. Competitors emphasize that the sti-P3® tank requires periodic monitoring and that if the monitoring is not performed and records are not kept, the owner can be fined $10,000 a day. These claims put the sti-P3® tank at a competitive disadvantage.

One commenter (Letter to David Ziegele from Anonymous) notes the steel tank industry is currently under great pressure to be profitable as well as competitive. The commenter reports that privately, many companies oppose eliminating the monitoring requirement for single-walled steel tanks. While some companies do not want to manufacture single-walled USTs for reasons of liability, the commenter feels that companies will be forced to manufacture such products in order to remain competitive should the monitoring requirement be rescinded.

One commenter (Xerxes Corporation) states that, based on experience, sti-P3® tanks, particularly single wall versions, are priced competitively with other tanks. The commenter indicates that the added cost of the monitoring requirement does not make sti-P3® tanks uncompetitive with competing brands.

Another commenter (State of Michigan, Department of State Police) notes that the Tillinghast report indicates that owners are choosing aboveground tanks. This contradicts the Steel Tank Institute's claim that owners are choosing other underground systems because they feel that the monitoring requirement is a nuisance.

Another commenter (Marcel Moreau Associates) notes that if consumers consider monitoring to be a nuisance and choose other tanks it is simply a fact of life in a capitalist economy that should not be used as a justification for eliminating the monitoring requirement. The commenter strongly expresses his opinion that monitoring is a standard practice for a tank with a cathodic protection system. If a consumer wants to have a tank with a cathodic protection system, it is reasonable to require that the system be operated properly. This commenter also acknowledges that monitoring the cathodic protection system costs money, but states that the practice is essential to the proper operation of an sti-P3® tank. He argues that if one cannot afford to operate an sti-P3® tank in the manner that it should be operated, one should consider using a different technology. He states that if the Steel Tank Institute thinks that the cost of monitoring is causing the sti-P3® tank to be viewed as a non-viable technology in today's marketplace, it is the result of the natural workings of the free market.

One commenter (Xerxes Corporation) feels that the fact that the monitoring requirement is affecting buyers' choices is not a special case. The commenter implies that every tank has characteristics which buyers like or dislike, and their choices will be affected by those consumer tastes and the availability of other products on the market.

Another commenter (Green Environmental & Corrosion, Inc.) contends that when considering whether to modify the current monitoring requirement, the opinions of the engineering community should far outweigh that of an economically affected provider. The commenter reports that the claims made by Steel Tank Institute are based on economics rather than on engineering principles.

Response

The Agency agrees with commenters who stated that cathodic protection monitoring is easy to perform and relatively inexpensive. Problems commonly reported with monitoring, such as incorrect readings caused by low soil moisture content, often can be rectified by relatively simple means, such as adding water to the soil and taking the reading again. The Agency agrees with the commenter who stated that a lack of understanding of cathodic protection on the part of owners and installers should not be a reason for eliminating the monitoring requirement, and, instead, better understanding is what is needed. The Agency acknowledges the comment that the Tillinghast report mentions the need for more training for UST installers and operators. The Agency acknowledges the comment that incorrect testing procedures could lead to inaccurate cathodic protection readings. However, the Agency believes that the UST regulatory requirements for testing act to ensure that incorrect testing does not pose undue risks. For example, the fact that monitoring must be repeated periodically reduces the risk that a single inaccurate reading may be relied on for many years. The comments overall support the conclusion, also expressed in a report by STI, that the cost of monitoring is minimal and that it is easy.

Other commenters provided data showing that cathodic protection monitoring is relatively inexpensive, ranging from $95 to $200 per typical location with three USTs. The monitoring is inexpensive relative to many other expenses involved in installing and operating USTs. The Agency understands that a typical three-tank retail fuel marketing facility costs over $100,000 to construct. In addition, the monitoring is inexpensive in terms of both time and money relative to the costs to both the private and public sector of the consequences of a leak, which could result from several causes, including insufficient tank corrosion protection. There have been over 250,000 confirmed releases; sites with only soil contamination often cost tens of thousands of dollars to address; remediation of contaminated groundwater sites typically cost over $100,000. The Agency believes that the costs of monitoring are reasonable and do not place an unnecessary financial burden on owners and operators.

In response to concerns that the costs of cathodic protection monitoring affect consumer choices, the Agency acknowledges that this argument may be plausible, but believes it is one of several factors that have lead to changes in the market shares for various tank technologies over the past few years. In response to the commenters who indicated that customers sometimes choose other technologies without proven track records to avoid the monitoring burden, the Agency believes that all the technologies allowed in the final technical rule (40 CFR 280.20) are protective of human health and the environment. These technologies include corrosion protected steel, fiberglass-reinforced plastic, steel clad with fiberglass-reinforced plastic, and, for sites meeting certain requirements, steel without additional corrosion protection.

6. Failure to Enforce the Cathodic Protection Monitoring Requirement Is Not a Justification to Relax the Frequency of the Requirement

One commenter (New York State Department of Environmental Conservation) noted that the Tillinghast report states that enforcement of the monitoring requirement is not a high priority with federal and state inspectors. The commenter argues that the current lack of enforcement of the monitoring requirement does not reduce the need for monitoring. The commenter states that if in the future leaks are detected from USTs because the tanks did not remain corrosion resistant, the issue of compliance with the cathodic protection monitoring requirements will become much more important.

Another commenter (Marcel Moreau Associates) notes that corrosion protection enforcement has not been a priority in many states because resources are being applied to more immediate problems such as leaks and existing contamination. The commenter has noticed great interest in corrosion protection among state regulatory personnel. The commenter notes that he has conducted or is scheduled to conduct corrosion protection training for regulatory personnel in thirteen states.

Another commenter (State of Michigan, Department of State Police) notes that the Steel Tank Institute reports that since enforcement efforts are directed at cleanup and leak detection, cathodic protection monitoring is not an essential activity in the UST program. This commenter responds that states determine program priorities based on a variety of factors, and that these priorities are not necessarily an indication of the overall value of cathodic protection monitoring. Another commenter (Xerxes Corporation) indicates that although the cathodic protection monitoring requirement is not being enforced, it is still considered a priority. The commenter suggests that enforcement of the requirement will occur after 1998, the regulatory deadline for all tanks to be corrosion protected.

6.1 Enforcement of the Monitoring Requirement Would Enhance Owners' and Operators' Ability to Comply with the Requirement

One commenter (Cayuga/Onondaga Board of Cooperative Services) observed poor compliance with the cathodic protection monitoring requirement. This commenter, with more than eight years of experience in tank testing and installation involving nearly 100 sti-P3® tanks, specifically noted that the required cathodic protection testing data was on file with owners and operators in only about 2-3% of the cases with which he had been involved. Data were not available for a variety of reasons. Steel piping was inaccessible, lacked protective cathodic coatings, or did not have anodes attached. Some tanks had anodes that were still covered by plastic coverings on inspection following installation. The commenter also noted that fewer than 50% of the tank installations he observed provided test leads accessible for test metering. The commenter concludes that since there is a small number of accessible, cathodically protected piping installations, the cathodic protection monitoring regulations, both state and federal, appear unfeasible.

Response

While the Agency acknowledges that enforcement priorities may vary among states, the extent of current enforcement activity does not determine the need for the frequency of monitoring cathodic protection systems. The Agency believes that cathodic protection monitoring is an important component of prevention activities for UST owners and operators. Cathodic protection monitoring is important because it is a relatively inexpensive preventive measure owners and operators can take to ensure they do not have equipment susceptible to external corrosion and the resulting product loss. The Agency also notes that the UST regulations require less frequent cathodic protection monitoring than do other federal regulations promulgated by EPA (40 CFR 264.195) and the Department of Transportation (49 CFR 192.455 to 192.477, Appendix D). The Agency does not believe the UST monitoring requirements are unnecessarily burdensome.

The Agency acknowledges that in many states, enforcement of the leak detection requirements have been given priority over cathodic protection monitoring requirements because of the earlier leak detection compliance deadlines. However, the Agency agrees with the comment that, with the upcoming 1998 compliance deadline for corrosion protection of all regulated USTs, emphasis will most likely shift to include more vigorous enforcement of the cathodic protection monitoring requirements. This is because compliance with the 1998 deadline is very important in protecting the environment, and because enforcement can be more straightforward and uniform at that time, since there will be no question as to whether an UST must meet the requirements.

In response to the commenter who stated that since there are many tanks without test leads accessible for testing, the Agency notes that, while test leads make monitoring easier, they are not necessary for testers to make the needed electrical contacts.

7. Miscellaneous Issues

One commenter (KCL Projects Ltd.) expressed concern that the sti-P3® system has no means of protection against internal corrosion. This commenter suggested that the Agency ask Tillinghast to provide data relating to the effectiveness of the sti-P3® tank at preventing leaks due to internal corrosion.

One commenter (Fond du Lac County, Office of the County Highway Commission) misunderstood the solicitation for comments, and argued that the Agency should not impose stricter standards on sti-P3® tanks by requiring that those tanks be removed and upgraded with new cathodic protection devices.

One commenter (Corrosion Control Specialist, Inc.) stated that the Agency and NACE need to clarify that the qualifications for a corrosion engineer which are stated in 40 CFR Section 280.12 should not be interpreted too liberally. Specifically, clarification should focus on distinguishing between the different levels of NACE certifications.

Another commenter (AT&T) states that the Agency needs to formalize it's position regarding cathodic protection testing of double wall USTs, and that the position be included in any amendments to the cathodic protection requirements of the UST regulations. The commenter says that currently the Agency's position is that the UST regulations do not require testing of double wall steel USTs, but that state and local regulatory agencies that promulgate and enforce UST regulations may not be aware of the Agency's position. This position was delineated in a letter dated July 18, 1991 from David O'Brien of the Agency to Charles A. Frey of Highland Tank & Manufacturing Company. The commenter states that the RCRA Hotline and OUST refer to this letter as a statement of the Agency's position.

One commenter (Fiberglass Petroleum Tank & Piping Institute) states that sti-P3® tanks do not qualify to be sold under the Underwriters Laboratories label. The commenter notes that the Steel Tank Institute alludes to compliance with the UL standard in their advertisements because they say, "built to nationally recognized Steel Tank Institute and Underwriters Laboratories standards." This commenter asks the Agency to recognize that the Steel Tank Institute advertisements, despite their reference to UL, should not be assumed to convey approval of the sti-P3® tank by Underwriters Laboratory.

Response

In general, the Agency acknowledges these comments but does not believe they are directly relevant to the issues addressed by the Notice of Data Availability, nor do they provide specific data that can be used in evaluating the appropriateness of the current cathodic protection monitoring requirement. The Agency, however, appreciates these comments and has given them due consideration in its decisionmaking process.

In response to the comment regarding internal corrosion, the Agency notes that its current inquiry is limited to STI's request to relax the monitoring requirements, the Tillinghast report, and the Notice of Data Availability, which all focus on external corrosion. In any event, *the Agency's information is that internal corrosion of steel tanks historically poses a much smaller risk of release than does external corrosion.*

The comment concerning removal of sti-P3® tanks is not relevant because cathodic protection monitoring applies only to installed tanks. The cathodic protection requirement has no direct relation to tank removal.

The comment regarding the UST regulations, corrosion engineer qualifications, and NACE International certification levels is not within the scope of STI's request to relax the monitoring requirements, the Tillinghast report, or the Notice of Data Availability. In any event, the Agency is reviewing these subjects in a separate activity and acknowledges this comment.

The Agency acknowledges the comment regarding cathodic protection monitoring of double wall cathodically protected steel USTs. However, the Agency's Notice of Data Availability spoke to single wall cathodically protected tanks, and the Agency believes it is this type of tank which is most crucial to monitor for cathodic protection.

In response to the comment about the compliance of sti-P3® tanks with Underwriters Laboratories (UL) standards and about STI advertisements, the Agency notes that this comment is not within the scope of the current discussion. Instead, this is a matter more appropriately pursued with STI and/or with UL.

ENDNOTES

1. John W. Kennedy Company, Inc. #1; JEMKO Petroleum Equipment, Inc.; Oil Equipment Sales, Inc.; Northeast Mechanical Corporation; EnviroReps, Inc.; Advanced Pollution Control; Parker & Associates, Inc.; Fedco Tank and Equipment, Inc.; John W. Kennedy Company, Inc. #2; Pet-Chem Equipment Corp.; Gould Equipment Company; Whitelock and Woerth, Inc.; Francis Smith & Sons, Inc.; J.M.A. Associates, Inc.; Engineered Equipment Sales Inc.; Quality Petroleum Systems, Inc.; Hirri Service Company; Professional Petroleum Service Company; TJ Equipment Company; James B. Phillips Company, Inc.; Trombold Equipment Company; Young Equipment Division; D.T. O'Connor, Inc.; Meter & Tank Equipment Company, Inc. #1; Meter & Tank Equipment Company, Inc. #2; Meter & Tank Equipment Company, Inc. #3; Samuel K. Spigler Company, Inc.; Highland Tank & Manufacturing Company #9; Sammie Huff Contractors, Inc., Gilarco Sales & Service; Ten Hoeve Brothers, Inc. #2; Ten Hoeve Brothers, Inc. #3; Jon El, Inc., Mechanical Equipment Sales; NECO Equipment Company; Allan U. Bevier, Inc.; Tate Instrumentation & Controls

2. These commenters misinterpreted the total failure rate provided for the 591 tanks in the Geyer Report. The actual failure rate cited in the Geyer Report is 10%.

3. Highland Tank & Manufacturing Company #1; Highland Tank & Manufacturing Company #2; Luther P. Miller, Inc.; Toot-N-Scoot: A Division of Best Oil Inc.; Boulder Oil Company; Dean Fowler Oil Company; Lou Korchak Oil Company, Inc.; John W. Kennedy Company, Inc. #1; Emmart Oil Company; Enercon Services, Inc.; Highland Tank & Manufacturing Company #3; Midstate Fuel Storage Systems; Interface Services, Inc. #1; Alaskan Oil; Clemett & Company; Interface Services, Inc. #2; JEMKO Petroleum Equipment, Inc.; Earl "Jerry" Galvin Manufacturers Representative; Environmental & Energy Systems Company #1; Carlucci Construction Company, Inc.; Environmental & Energy Systems Company #2; Oil Equipment Sales, Inc.; Fedco Manufacturing Corporation; JABE Construction & Equipment Inc.; Barkman Oil Company Inc.; Environmental & Energy Systems Company #3; Miller's Petroleum Systems, Inc.; Tiger Fuel Company; H.J. Tanner, Inc.; Northeast Mechanical Corporation; Glider Oil Company; EnviroReps, Inc.; HOBBS Inc. #1; Advanced Pollution Control; HOBBS Inc. #2; Parker & Associates, Inc.; Fedco Petroleum Installations, Inc.; Kelley Omega, Inc.; Fedco Tank and Equipment, Inc.; Center Point Tank Services, Inc.; C & S Contractors & Equipment, Inc.; Mon Valley Petroleum Company; Northrup Supply Corp.; Environmental & Energy Systems Company #4; J & J Marts, Inc., Mountaineer Mart; Gary Dyer Excavating Company, Inc.; Purvis Brothers, Inc.; Everybody's Oil Corporation; Alaskan Oil Inc.; International Association of Tank Testing Professionals; Coldiron Fuel, Inc.; Griffith Oil Company; C. Arlo Cummins; John W. Kennedy Company, Inc. #2; Bettiol Fuel Service, Inc.; Ravenna Oil Company; Pet-Chem Equipment Corp.; Leake Oil Company; Cuyahoga Landmark Petroleum Services; Varouh Oil, Inc.; The Lyden Company; Cross Oil Corporation; Highland Tank & Manufacturing Company #4; Gould Equipment Company; Beaver Petroleum Co. Inc.; M&M Oil Company, Inc.; The Coen Company; Petroleum Equipment Services, Inc.; James A. Grogey; Worth & Company, Inc.; A. Graziani & Company, Inc.; Highland Tank & Manufacturing Company #5; Whitelock and Woerth, Inc.; McKenzie Group, Inc.; Voegele Mechanical, Inc.; Francis Smith & Sons, Inc.; J.M.A. Associates, Inc.; Engineered Equipment Sales Inc.; Joseph Stong, Inc.; Quality Petroleum Systems, Inc.; Beck Suppliers, Inc; Lechmanik, Inc.; Ward's Pump and Tank; Edward J. Meloney, Inc.; Valley Equipment Company, Inc. #1; Grace Oil Company; Republic Oil Company, Inc.; Valley Equipment Company, Inc. #2; Humb Remodeling & Equipment; Jack Hirsch; Hirri Service Company; Black Equipment, Inc.; Professional Petroleum Service

Company; TJ Equipment Company; James B. Phillips Company, Inc.; United Environmental Group Inc.; Fedco Tank & Equipment, Inc.; Cernak Tank Company, Inc.; United Marketing, United Refining Company of Pennsylvania; Petro Tech Electronics Inc.; Trombold Equipment Company; G.E. Sell, Inc.; Steven J. Tornabine; Crawford Fuel & Oil; Holmes Oil Company; Young Equipment Division; Marshall Farms, Inc.; M&E Anderson Equipment & Testing; Laurel Valley Oil Company; E.E. Wine, Inc.; Rice Christ, Inc. #1; Rice Christ, Inc. #2; Rice Christ, Inc. #3; Eastern Petroleum Services, Inc.; Ullman Oil, Inc.; Carl Mundy Contractors #1; James Nichols; Tri-State Petroleum Corporation #1; Petroleum Services, Inc.; Ten Hoeve Brothers, Inc. #1; Carl Mundy Contractors #2; Kay Bibih; Tess Bechtold; D.T. O'Connor, Inc.; Penzoil Products Company; Carl Mundy Contractors #3; Joe DeFazio Oil Company; Childers Oil Company; J.H. Crosier Company; Bell Petroleum Ltd., Aviation Products Division #1; Fred's Plumbing and Heating #1; Fred's Plumbing and Heating #2; Sammy L. Throlup; Benit Fuel Sales & Service Inc. #1; Highland Tank & Manufacturing Company #6; Benit Fuel Sales & Service Inc. #2; Bell Petroleum Ltd., Aviation Products Division #2; Highland Tank & Manufacturing Company #7; Herman Goldner Company, Inc.; A.C. & T. Company, Inc.; Caledonia Oil Company #1; Caledonia Oil Company #2; Mountain State Bit Service, Inc.; SICO Company; Caledonia Oil Company #3; Meter & Tank Equipment Company, Inc. #1; Meter & Tank Equipment Company, Inc. #2; Meter & Tank Equipment Company, Inc. #3; Samuel K. Spigler Company, Inc.; Highland Tank & Manufacturing Company #8; Highland Tank & Manufacturing Company #9; Alliance Oil Service Company; Cortland Pump & Equipment Company; Bedford Valley Petroleum Corporation; Coastal Pump & Tank, Inc.; First State Petroleum Services, Inc. #1; Willison Oil, Inc.; Petroleum Industry Consultants, Inc.; Tri-State Petroleum Corporation #2; Sammie Huff Contractors, Inc., Gilarco Sales & Service; Ten Hoeve Brothers, Inc. #2; Ten Hoeve Brothers, Inc. #3; Jon El, Inc., Mechanical Equipment Sales; Lane & Clark Mechanical Contractors, Inc.; Craig K. William; Joseph Goffrey; Oil Equipment Sales & Service Company, Inc. (OESSCO); APCON Environmental Services, Inc.; Franklin Oil Company, Inc. #1; Baird Petroleum Equipment Corporation; Harris Oil Company, Inc.; Emmart Oil; Highland Tank & Manufacturing Company #11; James Islintu; R.L. Smiltz Oil Company, Inc.; Albright Oil, Inc.; Howard Gasoline & Oil Company; Shelving Installation Service, Inc.; First State Petroleum Services, Inc. #2; K & T Pump & Tank, Inc.; DePue Oil Company; NECO Equipment Company; Franklin Oil Company, Inc. #2; Allan U. Bevier, Inc.; Highland Tank & Manufacturing Company #12; Charles A. Frey; Oil Repair & Installation Company, Inc.; Delmarva Tank Specialists, Inc.; Smiles Are For Free - Everything Else is C.O.D.; Highland Tank & Manufacturing Company #13; Richard D. Galli; Goode Omega, Inc.; Tate Instrumentation & Controls

4. Fargo Tank Company; Highland Tank & Manufacturing Company #1; Luther P. Miller, Inc.; Toot-N-Scoot: A Division of Best Oil Inc.; Boulder Oil Company; Dean Fowler Oil Company; Lou Korchak Oil Company, Inc.; John W. Kennedy Company, Inc. #1; Emmart Oil Company; Enercon Services, Inc.; Midstate Fuel Storage Systems; Interface Services, Inc. #1; Alaskan Oil; Clemett & Company; Interface Services, Inc. #2; JEMKO Petroleum Equipment, Inc.; Earl "Jerry" Galvin Manufacturers Representative; Environmental & Energy Systems Company #1; Carlucci Construction Company, Inc.; Environmental & Energy Systems Company #2; Oil Equipment Sales, Inc.; Fedco Manufacturing Corporation; JABE Construction & Equipment Inc.; Barkman Oil Company Inc.; Environmental & Energy Systems Company #3; Miller's Petroleum Systems, Inc.; Tiger Fuel Company; H.J. Tanner, Inc.; Northeast Mechanical Corporation; Glider Oil Company; EnviroReps, Inc.; HOBBS Inc. #1; Advanced Pollution Control; HOBBS Inc. #2; Parker & Associates, Inc.; Fedco Petroleum Installations, Inc.; Kelley

Omega, Inc.; Fedco Tank and Equipment, Inc.s; Center Point Tank Services, Inc.; C & S Contractors & Equipment, Inc.; Mon Valley Petroleum Company; Northrup Supply Corp.; Environmental & Energy Systems Company #4; J & J Marts, Inc. Mountaineer Mart; Gary Dyer Excavating Company, Inc.; Purvis Brothers, Inc.; Everybody's Oil Corporation; Alaskan Oil Inc.; Coldiron Fuel, Inc.; Griffith Oil Company; C. Arlo Cummins; John W. Kennedy Company, Inc. #2; Bettiol Fuel Service, Inc.; Ravenna Oil Company; Pet-Chem Equipment Corp.; Leake Oil Company; Cuyahoga Landmark Petroleum Services; Varouh Oil, Inc.; The Lyden Company; Cross Oil Corporation; Highland Tank & Manufacturing Company #4; Gould Equipment Company; Beaver Petroleum Co. Inc.; M&M Oil Company, Inc.; The Coen Company; Petroleum Equipment Services, Inc.; James A. Grogey; Worth & Company, Inc.; A. Graziani & Company, Inc.; Highland Tank & Manufacturing Company #5; Whitelock and Woerth, Inc.; McKenzie Group, Inc.; Voegele Mechanical, Inc.; Francis Smith & Sons, Inc.; J.M.A. Associates, Inc.; Joseph Stong, Inc.; Quality Petroleum Systems, Inc.; Beck Suppliers, Inc; Lechmanik, Inc.; Ward's Pump and Tank; Edward J. Meloney, Inc.; Valley Equipment Company, Inc. #1; Grace Oil Company; Republic Oil Company, Inc.; Valley Equipment Company, Inc. #2; Humb Remodeling & Equipment; Jack Hirsch; Hirri Service Company; Black Equipment, Inc.; Professional Petroleum Service Company; TJ Equipment Company; United Environmental Group Inc.; Cernak Tank Company, Inc.; United Marketing, United Refining Company of Pennsylvania; Petro Tech Electronics Inc.; Trombold Equipment Company; G.E. Sell, Inc.; Steven J. Tornabine; Crawford Fuel & Oil; Holmes Oil Company; Young Equipment Division; Marshall Farms, Inc.; M&E Anderson Equipment & Testing; Laurel Valley Oil Company; E.E. Wine, Inc.; Rice Christ, Inc. #1; Rice Christ, Inc. #2; Rice Christ, Inc. #3; Eastern Petroleum Services, Inc.; Ullman Oil, Inc.; Carl Mundy Contractors #1; James Nichols; Tri-State Petroleum Corporation #1; Petroleum Services, Inc.; Ten Hoeve Brothers, Inc. #1; Carl Mundy Contractors #2; Kay Bibih; Tess Bechtold; D.T. O'Connor, Inc.; Penzoil Products Company; Carl Mundy Contractors #3; Joe DeFazio Oil Company; Childers Oil Company; J.H. Crosier Company; Highland Tank & Manufacturing Company #6; Benit Fuel Sales & Service Inc. #2; Bell Petroleum Ltd., Aviation Products Division #2; Highland Tank & Manufacturing Company #7; Herman Goldner Company, Inc.; A.C. & T. Company, Inc.; Caledonia Oil Company #1; Caledonia Oil Company #2; Mountain State Bit Service, Inc.; SICO Company; Caledonia Oil Company #3; Meter & Tank Equipment Company, Inc. #1; Meter & Tank Equipment Company, Inc. #2; Meter & Tank Equipment Company, Inc. #3; Samuel K. Spigler Company, Inc.; Highland Tank & Manufacturing Company #9; Alliance Oil Service Company; Cortland Pump & Equipment Company; Bedford Valley Petroleum Corporation; Coastal Pump & Tank, Inc.; First State Petroleum Services, Inc. #1; Willison Oil, Inc.; Petroleum Industry Consultants, Inc.; Tri-State Petroleum Corporation #2; Sammie Huff Contractors, Inc. Gilarco Sales & Service; Ten Hoeve Brothers, Inc. #2; Ten Hoeve Brothers, Inc. #3; Jon El, Inc., Mechanical Equipment Sales; Lane & Clark Mechanical Contractors, Inc.; Craig K. William; Joseph Goffrey; Oil Equipment Sales & Service Company, Inc. (OESSCO); APCON Environmental Services, Inc.; Franklin Oil Company, Inc. #1; Harris Oil Company, Inc.; Emmart Oil; Highland Tank & Manufacturing Company #11; R.L. Smiltz Oil Company, Inc.; Albright Oil, Inc.; Howard Gasoline & Oil Company; Shelving Installation Service, Inc.; First State Petroleum Services, Inc. #2; K & T Pump & Tank, Inc.; DePue Oil Company; NECO Equipment Company; Franklin Oil Company, Inc. #2; Allan U. Bevier, Inc.; Charles A. Frey; Oil Repair & Installation Company, Inc.; Delmarva Tank Specialists, Inc.; Smiles Are For Free - Everything Else is C.O.D.; Highland Tank & Manufacturing Company #13; Richard D. Galli; Goode Omega, Inc.; Tate Instrumentation & Controls

5. This commenter supports monitoring of the cathodic protection system immediately following installation an excavation disturbances or retrofit activities.

6. Fargo Tank Company; Highland Tank & Manufacturing Company #2; John W. Kennedy Company, Inc. #1; Highland Tank & Manufacturing Company #3; JEMKO Petroleum Equipment, Inc.; Oil Equipment Sales, Inc.; Northeast Mechanical Corporation; EnviroReps, Inc.; Advanced Pollution Control; Parker & Associates, Inc.; Fedco Tank and Equipment, Inc.; John W. Kennedy Company, Inc. #2; Pet-Chem Equipment Corp.; Highland Tank & Manufacturing Company #4; Gould Equipment Company; Beaver Petroleum Co. Inc.; Highland Tank & Manufacturing Company #5; Francis Smith & Sons, Inc.; J.M.A. Associates, Inc.; Engineered Equipment Sales Inc.; Quality Petroleum Systems, Inc.; Hirri Service Company; Professional Petroleum Service Company; TJ Equipment Company; James B. Phillips Company, Inc.; Trombold Equipment Company; Crawford Fuel & Oil; Young Equipment Division; Ten Hoeve Brothers, Inc. #1; D.T. O'Connor, Inc.; Bell Petroleum Ltd., Aviation Products Division #1; Fred's Plumbing and Heating #1; Fred's Plumbing and Heating #2; Sammy L. Throlup; Benit Fuel Sales & Service Inc. #1; Highland Tank & Manufacturing Company #7; Meter & Tank Equipment Company, Inc. #1; Meter & Tank Equipment Company, Inc. #2; Meter & Tank Equipment Company, Inc. #3; Samuel K. Spigler Company, Inc.; Highland Tank & Manufacturing Company #9; Sammie Huff Contractors, Inc., Gilarco Sales & Service; Ten Hoeve Brothers, Inc. #2; Ten Hoeve Brothers, Inc. #3; Jon El, Inc., Mechanical Equipment Sales; Baird Petroleum Equipment Corporation; James Islintu; NECO Equipment Company; Allan U. Bevier, Inc.; Charles A. Frey; Tate Instrumentation & Controls

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460
Mail Code 5401G

DEC 4 1995

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Technical Interpretation and Guidance Regarding the Combination of Cathodic Protection and Internal Lining

FROM: Lisa Lund, Acting Director
Office of Underground Storage Tanks

TO: EPA UST/LUST Regional Program Managers
State UST Program Managers

In response to questions from Regions 1, 4 and 7, the Office of Underground Storage Tanks (OUST) is providing a technical interpretation and guidance regarding the upgrade option listed in 40 CFR §280.21(b)(3), internal lining combined with cathodic protection for steel underground storage tanks (USTs). OUST believes that this regulation intended that owners/operators use this upgrade option by adding cathodic protection and internal lining at the same time. However, we understand that this regulation can be interpreted to mean that cathodic protection and internal lining may be added at different times. Therefore, the following three scenarios can occur:

1) the application of an internal lining and cathodic protection at the same time.

2) the addition of cathodic protection to an UST with an internal lining.

3) the application of an internal lining to an UST with cathodic protection.

In all three scenarios, the regulations are clear on the following points. First, the codes of practice for internally lining USTs listed in the note following § 280.21 (b) require that an internal inspection of the tank be conducted prior to application of the lining. [1] Second, an interior lining must be installed in accordance with the requirements of **§** 280.33 (See § 280.21 (b)(3)(i)). Finally, all cathodic protection systems must meet the requirements of § 280.20 (a)(2)(ii), (iii), and (iv), which includes the requirement that these systems be operated and maintained pursuant to § 280.31 (See § 280.21 (b)(3)(ii)). This last point means that cathodic protection systems must be subjected to periodic monitoring to ensure they are working properly and protecting the UST even though the tank has been properly lined.

The following discussion addresses each scenario in greater detail.

Scenario 1:

If an owner/operator chooses to upgrade a steel UST by the addition of cathodic protection and internal lining **at the same time**, then the integrity of the tank must be assessed by internal inspection and found to be structurally sound, followed by proper application of the internal lining and the addition of cathodic protection. The codes of practice for internally lining USTs listed in the note following § 280.21 (b) require that an internal inspection of the tank be conducted prior to application of the lining. In addition, the interior lining must be installed in accordance with the requirements of § 280.33. According to the preamble to the final rule for the UST technical requirements (see 53 Fed. Reg. 37131 [Sept. 23, 1988]), EPA's intent was that if owners and operators were to use interior lining as the sole method for meeting the corrosion protection upgrade, the tank must undergo periodic internal inspections as required by § 280.21 (b)(1)(ii). When combining the two corrosion protection methods, internal lining is no longer the sole method used for meeting the corrosion protection upgrade and, therefore, periodic inspection of the lining is not required. However, the cathodic protection system must be operated and maintained pursuant to § 280.31.

Scenario 2:

The codes of practice listed in the regulations are (1) American Petroleum Institute Publication 1631, "Recommended Practice for the Interior Lining of Existing Steel Underground Storage Tanks," and (2) National Leak Prevention Association Standard 631, "Spill Prevention, Minimum 10 Year Life Extension of Existing Steel Underground Tanks by Lining Without the Addition of Cathodic Protection."

If an owner/operator adds cathodic protection to a **previously internally-lined tank**, then in order not to be required to perform periodic internal inspections of the lined tank, the following must be done. Prior to the addition of cathodic protection, the integrity of the UST must be ensured pursuant to § 280.21 (b)(2). The method of integrity assessment must ensure the integrity of the UST, not just the lining. Once installed, the cathodic protection system must be operated and maintained in accordance with § 280.31. If the above criteria are used, then internal lining is no longer considered the sole method of corrosion protection upgrade and periodic inspection of the lining is not required. If, however, cathodic protection is added to an UST whose integrity was not ensured, then periodic monitoring/inspection of both the cathodic protection system and lining is required.

Regarding the integrity assessment set forth in § 280.21 (b)(2), OUST recommends that an acceptable method of ensuring the tank's integrity is to have a corrosion expert (defined in § 280.11) determine that the UST is structurally sound and free of corrosion holes. The owner/operator should maintain a record regarding this determination for the operating life of the UST. If a cathodic protection system is added to a lined tank using the above criteria, OUST recommends that the lined tank no longer require periodic inspection of the lining. The cathodic protection system must be operated and maintained in accordance with § 280.31. This recommendation is consistent with § 280.20 (a)(4) and (b)(3), standards for new UST systems, which allow a corrosion expert to make the determination regarding corrosion protection, provided that records are kept for the life of the tank.

Scenario 3:

If an owner/operator adds an internal lining to an UST **already having cathodic protection**, then the codes of practice for internally lining USTs listed in the note following § 280.21 (b) require that an internal inspection of the tank be conducted prior to application of the lining. In addition, the interior lining must be installed in accordance with the requirements of § 280.33. Since the interior lining is not the sole method for meeting the corrosion protection upgrade, periodic inspections of the lined tank are not required. However, because of the language in § 280.21 (b)(3)(ii), the cathodic protection system must continue to be operated and maintained in accordance with § 280.31.

If you have any questions regarding this technical interpretation and guidance, please call Paul Miller of my staff at (703) 308-7242.

cc: ASTSWMO UST Task Force
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OUST Desk Officers
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Stanley Siegel, Region 2
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Kathy Nam, OGC
Randy Nelson, Region 7
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Paul Miller, OUST
Joe Lehmann, Subcon, Inc.
James Bushman, Bushman & Associates, Inc.
Michael Baach, Corrpro Companies, Inc.
Jay Lehr, Environmental Education Enterprises, Inc.
James Lary, Harco Technologies Corp.
Ray Kashmiri, ILFC, Inc.
Marcel Moreau, Marcel Moreau Associates
Mary Fitzgerald, NACE International
Shelley Nadel, NACE International
Alex Ralston, Petcon, Inc.
John Piazza II, Southern Cathodic Protection
Jack Quigley, University of Wisconsin
E. David Daugherty, University of Tennessee-Chattanooga

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

May 18 1995

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Guidance on Use of ASTM's Emergency Standard for Alternative Procedures for the Assessment of Buried Steel Tanks Prior to the Addition of Cathodic Protection (ES 40 - 94)

FROM: Lisa C. Lund, Acting Director
Office of Underground Storage Tanks

TO: State UST Contacts
UST/LUST Regional Program Managers
UST/LUST ORC Attorneys
Dawn Messier, OGC
Joan Olmstead, OECA

The purpose of this memorandum is to provide the subject guidance to implementing agencies. EPA recommends that implementing agencies determine that the methods described in a new industry consensus standard for ensuring the integrity of buried steel tanks prior to upgrading with cathodic protection, when combined with certain monthly monitoring, prevents releases in a manner that is no less protective of human health and the environment than methods specifically identified in the Federal underground storage tank (UST) upgrading standards. Upon such a determination, this combination method may be used to meet 40 CFR § 280.21(b)(2)'s requirement that tank integrity be ensured prior to upgrading with cathodic protection. See 40 CFR § 280.21(b)(2)(iv).

Specifically, EPA recommends that implementing agencies determine that the combination of:

1) the implementation of procedures in American Society of Testing and Materials (ASTM) Emergency Standard ES 40 - 94, AND;

2) monthly monitoring for releases in accordance with 40 CFR § 280.43(d) through (h) following the upgrade

constitutes a method that prevents releases in a manner that is no less protective of human health and the environment than the methods listed in 40 CFR § 280.21(b)(2)(i) through (iii), for the period of time that the ASTM Emergency Standard is valid. <u>The ASTM Emergency Standard is valid for two years (November 15, 1994 to November 15, 1996)</u>.

The Agency recognizes that State and local implementing agencies can be more stringent than the Federal program, and that they may choose to accept or not accept this recommendation. Owners and operators of USTs should check with their implementing agency to determine if the above combination method is accepted before using it for regulatory compliance.

Included in "2) monthly monitoring..." above are interstitial monitoring, automatic tank gauging, ground water and vapor monitoring, and, where accepted by state and local implementing agencies, statistical inventory reconciliation or other methods meeting the standards in the referenced regulations. The combination of tank tightness testing and inventory control is not included in the referenced regulations.

The ASTM Emergency Standard sets forth for the first time procedures for inspecting and assessing the integrity of steel tanks without putting a person inside the tank. The Standard also defines the work that must be done so that an interested party can scrutinize the contractor's performance. Moreover, it provides standard procedures and thereby promotes consistency in the upgrading of buried steel tanks in those states and localities that already allow the use of these methods, as well as for those states that are deciding what methods to allow for inspecting and assessing buried steel tanks. For additional background on this issue, please see the attached discussion paper.

Implementing agencies, owners and operators should note that under the ASTM Emergency Standard there are criteria that providers of the services included in ES 40 - 94 must meet. For example, determining tank condition and suitability for upgrade using non-invasive techniques must be based on a data base from at least 100 sites where at least 200 tanks were excavated and evaluated. Also, there are many steps requiring action by a "corrosion expert," a term that has the same definition as in EPA's UST regulations.

It should be noted that EPA's UST regulations also provide for interior tank lining to be used as an upgrade option for existing UST systems. This guidance is in no way intended to discourage the use of tank lining as an acceptable upgrade option.

If you have any questions about ASTM ES 40 - 94, please call our technical contacts on this issue, Randy Nelson EPA Region 7 at (913) 551-7220, or Paul Miller at (703) 308-7242.

Attachment

cc: Dave Webster, Region 1
Stanley Siegel, Region 2
Robert Greaves, Region 3

Mary Kay Lynch, Region 4
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Guanita Reiter, Region 6
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 14 1995

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Supplementary Guidance on the Use of ASTM Emergency Standard ES 40-94

FROM: Lisa C. Lund, Acting Director
Office of Underground Storage Tanks

TO: State UST Contacts
UST/LUST Regional Program Managers

This memorandum provides further guidance on the use of American Society of Testing and Materials (ASTM) Emergency Standard ES 40-94 and builds on our guidance of May 18, 1995 (attached). Two issues are addressed. The first issue is manual tank gauging. The second is concern about differences between the May 18th memo and previously circulated drafts. Our purpose here is to clarify our position on these topics and to provide implementing agency officials with additional information on this rather complex issue.

Regarding the first issue, a question has been raised on how manual tank gauging fits into our May 18, 1995 guidance. Manual tank gauging, performed according to 40 CFR 280.43(b), does qualify as a monthly leak detection method for tanks with capacities up to and including 550 gallons. (With additional restrictions, it also can be used on tanks up to and including 1000 gallons, under 280.43(h)[1].) Therefore, although its use may be rare, manual tank gauging is included in the list of acceptable leak detection methods in our guidance.

Regarding the second issue, in drafts of November 15, 1994 and February 3, 1995, we stated that OUST "believes that, when used in combination: 1) the implementation of procedures in ASTM Emergency Standard ES 40-94, and; 2) [certain leak detection procedures] constitute a method that is no less protective of human health and the environment than the methods listed in 280.21(b)(2)(i) through (iii)...." Furthermore, the drafts stated that we recommend that UST program implementing agencies make such a "no less protective" determination.

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[1] See booklet *Manual Tank Gauging: For Small Underground Storage Tanks*, EPA 510-B-93-005.

In the final guidance of May 18, we made the same recommendation, reworded slightly to match the regulatory language. However, the final did not contain a statement that EPA or OUST believes that the combination was as protective.

First, we acknowledge that there has been some confusion on this issue, and apologize for any inconvenience that the changes may have caused. We made multiple changes as we attempted to incorporate comments which made our guidance both clearer and legally correct. We certainly did not anticipate that this particular change would alter the way the guidance was viewed.

Second, please be assured that we would not recommend that implementing agencies make a determination under the federal UST regulations if we did not ourselves believe that it was a worthwhile option, based on the best available technical information.

EPA does believe that in general the combination of ES 40-94 and monthly leak detection per either 280.43(b) or 280.43(d) through (h) prevents releases in a manner that is no less protective of human health and the environment than the methods listed in 40 CFR 280.21(b)(2)(i) through (iii). Therefore, EPA recommends that implementing agencies accept this combination as no less protective. We acknowledge that there are variables among jurisdictions, including soil characteristics and availability of technical expertise. The Agency recognizes that implementing agencies may choose to be more stringent than EPA. Thus, state and local implementing agencies may make the final decision on this issue. In situations when EPA is the implementing agency, e.g., on tribal lands, EPA Regions are hereby guided to accept this combination as preventing releases in a manner that is no less protective.

As you know, for the vast majority of regulated USTs, EPA is not the primary implementing agency, but rather a resource for other implementing agencies. There are several sections in the UST regulations when the implementing agency may make a determination that an alternative method or time frame is no less protective. One is 280.21(b)(2)(iv), which allows an implementing agency to determine that an alternative method of ensuring integrity is no less protective.

Why doesn't EPA make a "no less protective" determination itself? During review of comments on the guidance drafts, it became clear that for programmatic and legal reasons, and because of the need to issue guidance in a timely manner, the best option was not for EPA itself to make a determination under 280.21(b)(2)(iv) for any class of USTs, whether it is or is not the implementing agency. We estimate that it would take the Agency over a year to issue such a formal determination, by which time the Emergency Standard would be near expiration. The preamble to the final rule's discussion about leak detection methods is relevant to this subject, and supports the option we chose.

> "The Agency is convinced ... that allowing approval by the implementing agency, including those at the state and local level, will enable a new method to be used more quickly because the implementing agencies would not have to wait for a Federal approval before a method could be implemented. In addition, the precedent set when a new method passes

an evaluation in one implementing agency should facilitate succeeding reviews by other agencies." (53 Fed. Reg. 37165)

I hope that this information helps you make decisions that are right for your program regarding this issue. If you have any questions about this matter, please call Randy Nelson of EPA Region 7 at (913) 551-7220, or David Wiley of OUST at (703) 308-8877.

Attachment (without Discussion Paper)

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Robert Greaves, Region 3
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460
Mail Code 5401G

OCT 21 1996

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Interim Guidance on Integrity Assessment of Bare Steel USTs

FROM: Joshua Baylson, Acting Director
Office of Underground Storage Tanks

TO: State UST Program Managers
EPA UST/LUST Regional Program Managers

The purpose of this memorandum is to provide guidance regarding integrity assessment requirements for bare steel underground storage tanks (USTs) ten years old or older under 40 CFR 280.21(b)(2)(iv). This subject is of great interest and importance as we near two dates -- December 22, 1998, by when all regulated UST systems must be protected from corrosion, and November 15 of this year, when a key industry standard, ASTM ES 40 - 94, expires. A proposed replacement to ES 40-94 is currently undergoing revision through the ASTM process; however, based on meetings the week of October 14, ES 40-94 will expire before a replacement can be finalized.

OUST recommends that implementing agencies continue to follow their current policies regarding allowed integrity assessment methods until more information is available and OUST issues further guidance.

In the past, through guidance dated May 18, 1995, and September 14, 1995, OUST recommended that states find that the combination of the techniques listed in ASTM Emergency Standard ES 40-94 and monthly leak detection monitoring are no less protective of human health and the environment than those techniques listed at 40 CFR 280.21, for the two-year life of the emergency standard. We are not able to provide further guidance now because the ultimate fate of ES 40's proposed replacement is unknown, and because we would like to include some additional information. This information will include, for both internal (human entry) inspection and the alternative technologies, limited field observations from an EPA engineering study and summaries of performance data from vendors. It also will include the results of a search of recent literature and interviews with experts regarding the likelihood of USTs testing tight but still leaking after the application of cathodic protection.

In our May 1995, guidance we noted that monthly leak detection monitoring following upgrading according to ES 40-94 would provide helpful performance data. We are very interested in any such data you may have regarding the leak-free performance of tanks upgraded after assessment by either internal inspection or alternative methods.

We acknowledge that integrity assessment of older tanks is a controversial issue and understand that many of you are under pressure to craft your policies in certain ways. OUST recently has become aware that a small number of states have allowed another approach to meet the "as protective" standard for these older tanks. This approach is similar to one of the options listed in the regulations at 40 CFR 280.21 for upgrading USTs which are less than ten years old. The approach involves performing a tank tightness test prior to adding an impressed current cathodic protection system. Another tightness test is then required three to six months following the addition of cathodic protection to ensure the tank has not begun leaking since the corrosion protection upgrade. An additional requirement is that monthly leak detection monitoring be employed on the upgraded system. While this may at first seem to be a simple, low cost technique to evaluate the suitability of an older tank for upgrading, OUST has technical concerns with this approach. **At this time we recommend against changing to a policy relying only on leak detection for assessing older bare steel tanks for integrity.**

The first concern relates to why the ten year old breakpoint was incorporated into the regulations in the first place. The preamble to the regulations (see 53 Fed. Reg. 37132) states:

> For tanks 10 of age and older, these two methods above (either a pair of tank tightness tests or monthly release detection monitoring) are inadequate to ensure structural soundness before the cathodic protection system is installed. ... As described above, unprotected tanks often corrode through but do not leak because the corrosion product, backfill, and interior sludge seal the hole.... EPA has concluded ... that as many as 7 percent of existing USTs are corroded through, but not leaking. Many more existing tanks may be heavily corroded and not suitable for cathodic protection alone as an upgrading measure.

In writing the regulations, EPA believed that newer tanks were much less likely to have corrosion holes than older tanks. Therefore, EPA allows this option only for tanks under ten years of age. At this time, we do not have any studies or technical documentation which contradict the preamble or regulations in this regard.

Second, we have heard of tanks having holes with tightly adhering rust (so-called “rust plugs”) beginning to leak after the addition of cathodic protection. Once impressed current is added to a tank with rust-plugged holes, the current which protects the tank also can loosen the rust plugs, causing the once-plugged hole to begin leaking.

Third, a tank which has a very small leak or which has a hole that is not yet leaking because it is blocked by something (such as clay, sludge, or other material) external to the tank, will pass a tightness test but begin to leak or leak at a higher rate over time. A tank such as this should either be closed or repaired prior to being upgraded.

At this time we recommend that implementing agencies exercise caution in any contemplated reformulation of policies, and that they continue to follow their previous policies until we issue further guidance regarding integrity assessments. It is imperative that we assure that only those tanks suitable for upgrading are upgraded, so as to prevent another generation of leaking tanks. We continue to believe that ensuring the integrity of USTs ten years old or older prior to upgrade is vital. Again, we note that no studies or other technical information have been provided to contradict the language in the preamble or the technical regulations. If you have any information to share or questions to ask, please contact David Wiley at (703)603-7178.

cc: Regional Program Managers’ Supervisors
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Dennis Rounds, Chair, ASTM Subcommittee E50.01
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460
Mail Code 5401G

JUL 25 1997

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Guidance On Alternative Integrity Assessment Methods For Steel USTs Prior To Upgrading With Cathodic Protection

FROM: Anna Hopkins Virbick, Director
Office of Underground Storage Tanks

TO: EPA UST/LUST Regional Program Managers
State UST Program Managers

This memorandum provides guidance that pertains only to a relatively small subset of all underground storage tanks (USTs). This subset of USTs consists of steel USTs that are not yet protected from corrosion, that will not be internally lined to meet the 1998 deadline for corrosion protection, and that will be assessed by alternative methods other than either human-entry internal inspection or leak detection before cathodic protection is added.

In our memorandum of October 21, 1996, we recommended to UST program implementing agencies that they continue to follow their current policies regarding allowed integrity assessment methods for this subset of tanks until more information and guidance became available. On March 6, 1997, we circulated additional information and draft guidance. Today's memorandum finalizes our guidance on this subject. The guidance promotes protective and affordable integrity assessments while maintaining regulatory flexibility for implementing agencies.

Guidance On The Use Of Alternative Integrity Assessment Methods

Federal UST regulations require that existing steel tanks without corrosion protection must be assessed for structural integrity before cathodic protection can be added to meet corrosion protection requirements. Basically, tanks that are not structurally sound must not have their operational lives extended. Specifically, the federal UST regulations at 40 CFR § 280.21(b)(2) state that an assessment method may be used to ensure the integrity of steel tanks prior to upgrading with cathodic protection if the assessment method is listed in the regulations or if the implementing agency determines that an alternative assessment method prevents releases in a manner that is no less protective of human health and the environment than those listed. Today's guidance pertains to determinations of alternative integrity assessment methods that are not listed in the federal regulations.

EPA recommends that implementing agencies determine that an alternative integrity assessment method that meets either Option A or Option B below be considered to prevent releases in a manner that is no less protective of human health and the environment than the methods listed in 40 CFR § 280.21(b)(2)(i) through (iii), which include human-entry internal inspection and, for tanks less than 10 years old, certain leak detection methods.

Option A. **Ensure tank integrity by using an alternative integrity assessment method that is in accordance with a standard code of practice developed by a nationally recognized association or independent testing laboratory.**

Option B. **Ensure tank integrity by using a vendor-supplied procedure that has been successfully evaluated and certified by a qualified independent third party to meet specified performance criteria regarding detection of perforations and detection of either internal or external damage. Within Option B, the criteria for proving tank integrity are as follows:**

1. **Detect *all* perforations; *and***
2. ***One of the following:***
   - **a) Detect external pits deeper than 0.5 times the required minimum wall thickness, *OR***
   - **b) Detect internal pits deeper than 0.5 times the required minimum wall thickness *AND* any internal cracks or separations.**

To meet a criterion, a method must demonstrate a probability of detection of at least 95 percent and a probability of false alarm of no more than 5 percent.

After March 22, 1998, EPA recommends that implementing agencies approve the use only of alternative integrity assessment methods meeting either Option A or Option B. Before March 22, 1998, agencies should maintain their current policies for alternative integrity assessment methods that do *not* meet either Option A or Option B. Also, before March 22, 1998, agencies should allow upgraded tanks that have used alternative integrity assessment methods meeting either Option A or Option B to select a leak detection method from those available after March 22, 1998 (as discussed below in today's guidance).

This guidance is not intended to discourage the use of human-entry internal inspection as an assessment method or tank lining as an acceptable upgrade option. EPA's UST regulations allow for interior tank lining to be used as an upgrade option for tanks lacking corrosion protection (40 CFR § 280.21(b)(1)). This guidance addresses only § 280.21(b)(2)(iv), which regards methods not specifically listed in the federal regulations.

The Difference Between "Method" And "Vendor-Supplied Procedure"

Option A addresses "integrity assessment methods" and Option B addresses "vendor-supplied procedures." Both "methods" and "procedures" share the common essential task of verifying the integrity of the tank, but they differ in the guidance as follows. A "method" is a general technology (such as the use of robotic devices or diagnostic modeling) that is in accordance with a standard code of practice. A “vendor-supplied procedure” is an application of a technology, usually marketed as a patented brand name and procedure. Under Option B, a “vendor-supplied procedure” must be successfully evaluated and certified by a third party. However, the guidance does not recommend the certifying of each individual contractor who may be the local provider of a “vendor-supplied procedure.”

Option A: Standard Codes Of Practice

Option A recommends that each alternative integrity assessment method comply with a standard code of practice developed by a nationally recognized association or independent testing laboratory. Compliance with a standard code is a requirement in almost all other areas of the federal UST technical regulations. Codes of practice are often updated over time, and so the code used must be the code applicable at the time that the alternative assessment is conducted.

The American Society for Testing and Materials (ASTM) has been the most active code body for alternative integrity assessments. A standard is being drafted by a joint task group under Subcommittees E50.01 on Storage Tanks and G01.10 on Corrosion in Soils. The first draft of the “Standard Guide for Three Methods of Assessing Buried Steel Tanks” was recently balloted, and is very similar to the expired ASTM ES 40, “Emergency Standard Practice for Alternative Procedures for the Assessment of Buried Steel Tanks Prior to the Addition of Cathodic Protection.” Since balloting is within G01.10 only, interested parties should contact ASTM’s Robert Held at (619) 832-9719 for information about participating in this standard development activity.

Although ASTM committees have been the most active, other nationally recognized associations and independent testing laboratories are not precluded from developing standard codes of practice.

Option B: Evaluation And Certification Process

Option B recommends that each vendor-supplied procedure intended to ensure tank integrity must receive third-party evaluation and certification that it meets criteria for establishing the integrity of a tank. Implementing agencies should allow the use only of those vendor-supplied procedures successfully evaluated and certified by a qualified independent third party to meet specified performance criteria regarding detection of perforations and detection of either internal or external damage.

In an evaluation and certification process, a vendor first contracts with a third party for evaluation. This third party should be a qualified test laboratory, university, or not-for-profit research organization with no financial or organizational conflict of interest. Based on the nature of the performance criteria, evaluations will likely be *qualitative*, but quantitative evaluations also are acceptable. The evaluation is performed first *without* and then *with* information about the leak status of the tank divulged to the vendor. The method’s performance characteristics, both with leak data and without, are determined, summarized on a “short form,” and certified by the evaluator. Owners and regulators can then use this documentation, along with other information, to make decisions that are right for their particular situations.

We have determined that an independent evaluation and certification process is already available for use in the UST community. This finding is based on discussions with vendors and third-party evaluators and industry’s experience with other UST system technologies.

In an evaluation, the determination of whether or not a vendor-supplied procedure meets the criteria *may* be based in part on leak detection data. This is allowed because protectiveness is based on the performance of the complete vendor-supplied procedure, and leak detection results often play a large role in integrity assessments. However, the performance of a vendor-supplied procedure *without* inclusion of leak detection data should still be reported on the short forms for informational purposes.

As is clear from the recommendations, no integrity assessment methods or vendor-supplied procedures that have been in use before March 22, 1998 should be "grandfathered" or considered exempt from following a standard code or from evaluation after March 22, 1998. However, those vendor-supplied procedures that were part of the 1996 field study conducted by EPA's Edison lab can use applicable data generated in that study as part of a more comprehensive evaluation. In addition, even if a company follows a standard code of practice, it may voluntarily put its vendor-supplied procedure through this evaluation process in order to obtain independent third-party documentation of performance characteristics.

Evaluation Protocols For Option B

More detailed information on evaluation can be found in the "Quality Assurance Project Plan" (QAPP) prepared for EPA's engineering study conducted in 1995 and 1996. We consider the original QAPP written for the EPA field study to be a viable, peer-reviewed evaluation test protocol. We recommend that evaluations conducted in accordance with it be considered valid. However, removal and examination as detailed in the QAPP may not be necessary, at least not for all tanks used in an evaluation. An approach that uses data in lieu of physical testing can be used if all relevant data requirements are factored in. An evaluator may choose alternative evaluation protocols or procedures, because of the potentially high cost of following the QAPP to the letter or because of special characteristics of the vendor-supplied procedure under evaluation. (The QAPP calls for an assessment method to be used on approximately 100 tanks, which are then removed from the ground for testing and inspection.) The development of other protocols is not precluded, but rather is encouraged.

We have investigated the EPA/private sector Environmental Technology Verification program, and found that it probably cannot provide assistance in the needed time frame. EPA will not be involved in the writing of additional protocols or in the funding of evaluations. However, EPA staff will be available to comment on draft protocols and to provide guidance to implementing agencies. In addition, we will provide optional summary forms, or "short forms," for the QAPP, as suggested by commenters. These will help industry give implementing agencies and owners relevant information in a consistent and understandable format.

Evaluation Criteria In Option B

The criteria in Option B above are based on those found in the QAPP. On each criterion, methods must demonstrate a probability of detection of at least 95% and a probability of false alarm of no more than 5%. Note that 100% accuracy is not specified. We have found it protective and cost-effective to rely on a series of multiple, complementary, and high-quality measures to achieve the greatest protection at a reasonable cost.

In addition to a mandatory criterion on perforations, a method must pass evaluation of a criterion for either external or internal damage. We structured the criteria in this way based partly on consistency with internal (human-entry) inspection standard codes. In addition, these criteria are based on our belief that not allowing the upgrading of tanks with either significant interior or exterior damage (unless they are repaired) yields significant benefits over the costs incurred. We do not believe, however, that the additional cost of assessing a tank for both internal and external damage provides a net benefit in significantly greater protection.

A criterion for loss of wall thickness over a wide area of the tank is not included, because our research found that failures due to uniform corrosion are very rare. Likewise, a criterion for tank deformation is not included, because it is generally found to be an issue only in fiberglass tank installations.

Recommended Commencement Date

Setting the recommended commencement date of March 22, 1998 allows time for standards to be developed and evaluations to be conducted, and comes before a significant portion of the anticipated assessment work. We extended the date proposed in our draft guidance in response to comments requesting more time. ***Note: the December 22, 1998 deadline for all existing UST systems to meet spill, overfill, and corrosion protection requirements will not be extended.***

Monthly Leak Detection Not Required

We earlier proposed to include stand-alone monthly leak detection monitoring in combination with the integrity assessment options. However, this monitoring is no longer part of our recommendation for integrity assessment methods fulfilling Option A or vendor-supplied procedures fulfilling Option B. We deleted monthly monitoring based on technical merit, consistency, and simplicity. We believe that if an integrity assessment method complies with either a standard code of practice or evaluation procedures as described above, then leak detection monitoring beyond that required in the federal regulations is not warranted on a nationwide basis, and we have not found performance data that indicates otherwise. In addition, deleting the additional monitoring brings all assessment methods in line with each other and simplifies the compliance picture.

If the implementing agency follows today's guidance, compliant USTs (correctly upgraded through alternative assessment, cathodic protection, protected piping, and spill/overfill protection) could follow the requirements of § 280.41(a)(1) allowing either stand-alone monthly monitoring or, for up to ten years, the combination of inventory control and tightness testing every five years. Note that the period during which this combination leak detection method is valid may be less than 10 years if the tank itself meets the 1998 standards for corrosion protection before other UST system components meet 1998 standards for spill, overfill, and corrosion protection, as clarified in our memorandum of July 25, 1997, "Applicability Of A Combination Leak Detection Method For Upgraded Underground Storage Tanks."

Recommendation Against Leak Detection As An Integrity Assessment

The question of whether leak detection alone should be used to assess older tanks prior to upgrading with cathodic protection has been raised from time to time. We received numerous comments on this subject, nearly all in agreement that leak detection alone is not sufficient.

Although we recognize the important role leak detection generally plays and allow the use of leak detection results in evaluations of integrity assessment methods, EPA does not recommend that leak detection alone be considered sufficient to assess the integrity of USTs 10 years old or older.

State Program Approval

A decision either to adopt or not adopt EPA's recommendations regarding integrity assessment would not affect the status of state program approval or of an application for approval. This is because EPA is providing recommendations only and not amending its regulatory criteria for state program approval.

Federal And State Consistency

We hope this guidance is accepted by implementing agencies because there are benefits to having consistency across jurisdictions. However, EPA recognizes that State and local requirements may differ from Federal requirements. We have included in Attachment 1 additional items that implementing agencies may consider in developing their integrity assessment policies.

Guidance Intended To Ensure Quality Of Integrity Assessments

EPA believes today's guidance will benefit the UST community and protect human health and the environment by ensuring quality alternative integrity assessments that can lead to extended operational life of older steel tanks. Option A can ensure that alternative integrity assessment methods are valid by being in accordance with national codes of practice. Option B can ensure that vendor-supplied procedures have met rigorous third-party evaluation and certification. However, for these Options to be most successful, UST owners will need to be informed to use only methods that meet code or vendor-supplied procedures that have been certified. Implementing agencies should make concerted attempts to inform their UST owners about what they need to look for to make sure they get a reliable integrity assessment.

Acknowledgments

Our March 6 draft guidance package sought input on the general approach, specific evaluation criteria, costs of evaluations, compliance and enforcement implications, and timing. I thank the state and EPA representatives who provided comments to our draft, including those from Arizona, District of Columbia, Michigan, Tennessee, and EPA's Office of General Counsel. I also thank the many other individuals and organizations that provided comments.

Disclaimer

EPA's Office of General Counsel advises that the policies set out in this document are not final agency action, but are intended solely as guidance. They are not intended, nor can they be relied upon, to create any right, benefit or trust responsibility, enforceable by any party, in litigation with the United States.

cc: EPA UST/LUST Regional Program Managers' Supervisors
OUST Program Directions Team

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ATTACHMENT 1

ADDITIONAL ITEMS FOR CONSIDERATION IN DEVELOPING INTEGRITY ASSESSMENT POLICIES

Agencies that implement underground storage tank programs may find the following items useful in conjunction with EPA's guidance in constructing their integrity assessment policies:

* Requiring certain documentation be submitted by vendors to UST owners or implementing agencies (or both). An example for human-entry assessments following NLPA 631 is Form CF-2, "Internal Inspection Affidavit," which must be maintained by the owner, according to the standard. An example for an alternative assessment would be a certification by the vendor that the work meets code or a short form summarizing the evaluation and limitations of a particular method.
* Requiring that companies, individuals, or both be licensed in order to perform assessments.
* Requiring monthly stand-alone leak detection monitoring following assessment and upgrade.
* Limiting the time between assessment and upgrade (for example, limit the time to six months).
* Putting mechanisms in place to make the vendor responsible for a tank failure due to improper assessment.
* Reviewing each vendor-supplied procedure before allowing it to be used, even if a vendor claims the procedure complies with a standard code of practice, to ensure the procedure meets all requirements of the code and of the agency.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460
Mail Code 5401G

OCT 9, 1998

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Alternative Integrity Assessment: New ASTM Standard

FROM: Anna Hopkins Virbick, Director /s/
Office of Underground Storage Tanks

TO: UST/LUST Regional Program Managers
State UST Program Managers

The purposes of this memorandum are to bring your attention to a new standard from ASTM (the American Society for Testing and Materials) for underground storage tank (UST) integrity assessment and to clarify how this standard relates to our previous guidance. While our guidance has not changed, this recent development can change the way integrity assessments (which are performed before upgrading bare steel tanks with cathodic protection) are done in jurisdictions that follow our guidance.

Background

EPA's July 25, 1997 guidance on this subject (attached) remains in effect essentially as written. As before, we recommend that implementing agencies determine that an alternative (to human entry) integrity assessment method be considered to meet the December 22, 1998 upgrading requirements *only if* it meets one of two options. Option A is accordance with a standard code of practice developed by a nationally recognized association or independent testing lab. Option B is using a procedure that has been successfully evaluated and certified by a qualified independent third party to meet the performance criteria specified in the guidance.

Regarding this issue, implementing agencies have been free to make their own determinations, including those different from EPA's guidance, and this will continue to be the case. First we discuss developments regarding Option A.

ASTM Action and Its Impacts

On September 10, 1998, ASTM approved an UST integrity assessment standard, ASTM G 158-98, "Standard Guide for Three Methods of Assessing Buried Steel Tanks." *EPA believes that assessments done in accordance with ASTM G 158 satisfy Option A in our guidance, and can be relied on for compliance with the upgrade requirements*, with the following condition on the visual inspection method. The condition is that the visual inspection method must be capable of detecting all pits and holes of size 1/8 inch (0.32 cm) or greater. (This stipulation was inadvertently left out of the standard during revision.)

We will provide you with a copy of the new standard as soon as possible. To purchase copies, please contact ASTM at (610)832-9585 or www.astm.org. In the meantime, note that the new standard is substantially the same as the November 25, 1997 draft which we circulated to you on January 13 of this year. Other items in the standard that you should note include the following.

* Although the standard requires that a form be filled out with certain information and notarized, this form does not necessarily provide a representative, comprehensive evaluation of a procedure's performance, or meet EPA's Option B.
* The standard not only requires that a leak detection system be used within six months of the integrity assessment, it requires that this be a tightness test at the 0.1 gallon per hour leak rate (see section 1.4).
* A leak detection test by itself is not sufficient to determine that a tank is suitable for upgrade.
* Finally, the use of a model to determine tank suitability must be based on present, not future, calculated probabilities of corrosion failure.

Regarding implementation, ASTM G 158 is similar to the former ASTM ES 40 in that it provides a blueprint for assessments, but does not address field implementation in detail. In the past few years, problems have been encountered at some sites where vendors claimed to follow the former ES 40, and problems will not all be solved by G 158. These problems included deviation from the standard, use of the standard where not appropriate, and poor documentation. Field implementation issues are often better addressed by implementing agencies and owners, rather than at the national level. However, in response to input from regulators, we have prepared a checklist to help regulators, owners, and operators ensure that G 158 requirements are followed. Please find attached the checklist, which lists all the requirements of the new G 158 and of the former ES 40.

For your information, ASTM has notified us that it plans to offer training on G 158. The training will target at UST owners, regulators, and environmental professionals. The stated purpose is to help regulators and owners and operators understand: what the new standard will provide; how to evaluate the credentials of vendors; how to assure the quality of work; and what results should be expected for each of the methods. ASTM will send detailed information on the training to you. In recognition of the importance of this training information to state agencies, a New England Interstate Water Pollution Control Commission grant is available to reimburse certain travel costs for state employees with a demonstrated hardship. The grant can pay for only a limited number of travellers, for no more than one person per state, and for no training or registration fees.

Third-Party Evaluation

Third-party evaluation of integrity assessment procedures (Option B in our guidance) continues to be a viable means for meeting EPA's guidance. For more information on procedures available under Option B, please see the List of Integrity Assessment Evaluations, which is a product of a state/EPA work group, and available from our office. Remember to note the limitations of each evaluation.

A protocol document is available to help assessment vendors and evaluators who wish to go through third-party evaluation. It is titled "Test Protocol For Evaluating Integrity Assessment Procedures For Underground Storage Tanks" (EPA-510-B-98-004). EPA regional offices, state agencies, and interested trade and professional associations are receiving a copy. This document includes the Quality Assurance Project Plan written in 1995. While the information included in the document has been available from EPA for some time, this booklet combines test procedures, forms, and past guidance in a single technical resource that can be ordered through EPA's usual channels. To obtain a copy, call EPA's document center at 800 490-9198 or EPA's hotline at 800 424-9346.

Relationship of Option A to Option B

EPA's recommends that either Option A or B be met. Of course, both can be met as well. Some implementing agencies may allow one option, but not the other. In such cases it is important to note that procedures meeting Option A do not necessarily meet Option B, and vice versa.

Human-Entry Inspection

Please remember that traditional, human-entry inspection remains an integrity assessment option that is standardized, viable, and compliant with federal requirements. Today's memorandum is not intended to discourage the use of the human-entry inpection method in any way.

Compliance Options

Some questions and concerns have been raised regarding the compliance status of tanks assessed with alternative integrity procedures and then upgraded with cathodic protection. Please see the attached table, "Compliance Options for Tank Leak Detection and Integrity Assessment." It shows how EPA leak detection and upgrading requirements and guidance apply to various situations. The table is intended as a reference for implementing agencies, which may share its contents with owners and operators if applicable and appropriate. Please note that, in several cases, state requirements supersede the information contained in the table. To give owners and operators a clear understanding of key aspects of compliance, we have created a brief flyer (attached). Below, we further describe certain integrity assessment situations and how our guidance applies to them.

Compliance Concerns: Alternative Assessments Done On or Before March 22, 1998

One group expressed a concern that our guidance might lead regulatory agencies to fine owners of tanks that were assessed with alternative procedures in accordance with ASTM ES 40 before March 23, 1998. This should not be a concern. EPA did not and does not recommend that agencies following our guidance find such alternative integrity assessments — those meeting

ASTM ES 40 and accompanied by monthly leak detection monitoring — invalid for compliance with December 22, 1998 requirements. This is true even if the procedure used never meets Option A or Option B. In support of this position, we believe that owners and operators which chose a procedure in full compliance with the requirements in place at that time should not have to do rework. We also note that procedures and methods may not meet Option A or Option B for a variety of reasons. For example, a former vendor may choose not to submit its procedure for third-party evaluation because it has left the assessment business. Please note that if an alternative assessment procedure does not meet Option A, does not meet Option B, *and* does not meet ASTM ES 40, then it has never been recommended by EPA for use as part of compliance.

Compliance Concerns: Alternative Assessment Done After March 22, 1998

For those assessments performed after March 22, 1998, another concern involves the point in time when an assessment first meets Option A or B. This issue is best understood by looking ahead to the day *after* the December 22, 1998 corrosion protection deadline. On this day the three possible scenarios regarding post-March 22 alternative assessments and our related guidance are as follow.

* An alternative assessment met either Option A or B at the time it was done. Thus, this assessment is valid for compliance.
* An alternative assessment did not meet either Option A or B at the time it was done, but on or before December 22, 1998 the same procedure used *does* meet Option A or B. For example, the assessment procedure used in the past now adheres to a new standard, such as ASTM G 158. This assessment is valid for compliance. (Note that the procedure used cannot have been a scaled down or less stringent version of the one that meets Option A or B.)
* An alternative assessment still meets *neither* Option A nor B. This assessment is *not* valid for compliance, and unless another assessment has been done, the corrosion protection requirements have not been met. This non-compliance continues until the old assessment procedure is shown to meet Option A or B, or until a compliant substitute assessment is performed.

Thus, for an assessment done after March 22, 1998, unless a procedure meets Option A or B at the time it is performed, the vendor cannot accurately represent that the UST will certainly meet the December 22, 1998 requirements. It may turn out to be the case; but it may not.

Compliance Concerns: Potential Uncertainty

One commenter voiced a concern that there has been uncertainty in the market. It is true that integrity assessment has been an active and contentious subject area for years. However, *this does not suppport or excuse failure to comply with the December 1998 deadline*. At all times during the ten years since federal regulations were published, an owner could perform either a traditional human-entry inspection method or an alternative method, in full compliance with EPA regulations and guidance.

Conclusion

We believe that the national UST program has, in part via implementation of our July 1997 guidance, built a framework that provides for a safe and environmentally protective outcome, but allows flexibility in choosing the means to achieve that outcome. Some claimed that no companies would be able to or would choose to meet our guidance, leaving owners with less flexibility and higher costs. History has shown this claim to be false. Better performance has been achieved without higher costs. The UST community has seen that industry can provide standard and proven methods. It has seen that, when it comes to the 1998 requirements, *we do not bluff*.

We appreciate the honest feedback and the support that many have provided, including regulators, industry, and members of ASTM Committees G1 and E50. If you have any questions, comments, or suggestions, please contact David Wiley by e-mail at wiley.david@epa.gov, by phone at 703-603-7178, or by fax at 703-603-9163.

Attachments:
* July 25, 1997 EPA "Guidance On Alternative Integrity Assessment Methods For Steel USTs Prior To Upgrading With Cathodic Protection"
* "Checklist of Requirements of Former ASTM ES 40 and Current ASTM G 158"
* "Compliance Options for Tank Leak Detection and Integrity Assessment"
* Flyer -- "Owners Upgrading USTs: Make Sure Your Integrity Assessment Has Integrity"

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Checklist of Requirements of Former ASTM ES 40 and Current ASTM G 158

This checklist is intended to be a companion to ASTM G 158-98 (valid 9/10/98), to help regulators and UST owners and operators to ensure that integrity assessments actually meet the standard. It lists the requirements of the standard in highlight fashion. It does not list all the details of the requirements, nor does it include important information that is not a requirement. Thus, this checklist cannot be used as a substitute for the standard. The standard is available from ASTM, at (610)832-9585 or www.astm.org. For those familar with the former ASTM ES 40-94 (which expired 11/15/96) its requirements are provided so that the main differences in the requirements of the two documents can be seen.

<table>
<tr><th>Former Emergency Standard ASTM ES 40 (Not Available)</th><th>ASTM Standard Guide G 158</th></tr>
<tr><td colspan="2">General Requirements</td></tr>
<tr><td>□ Required permits were obtained. (5.1)
□ Work was performed under the responsible supervision of a corrosion expert. (6.1)
□ Corrosion expert certified to the tank O/O that the personnel performing the assessment work on the tank were knowledgeable of all the applicable procedures. (6.2)
□ Corrosion expert certified to the tank O/O that all work was performed in strict accordance with this emergency practice. (6.3)
□ All applicable federal, state, and local health and safety codes and regulations were complied with. (7.1)</td><td>□ Method A (section 9), B (section 10), or C (section 11) was used to assess the tank's condition. A preliminary site survey was performed per Section 8. The tank was tightness tested per 5.2 and established as not leaking. (1.4)
□ Necessary authorities were consulted to obtain required permits. (5.1)
□ The corrosion assessment work was performed under the responsible direction of a corrosion specialist/cathodic protection specialist. (6.1)
□ The corrosion specialist/cathodic protection specialist certified to tank O/O that the personnel performing the assessment work on the tank were knowledgeable of all the applicable procedures in this guide. (6.2)
□ Corrosion specialist/cathodic protection specialist certified to tank O/O that all work was performed in strict accordance with this guide. (6.3)
□ All applicable federal, state, and local health and safety codes and regulations were complied with. (7.1)</td></tr>
<tr><td colspan="2">Determining the Leak Status of the Tank</td></tr>
<tr><td>□ Tanks were assessed using practice E 1430 or a method that had been certified in accordance with Federal EPA requirements to establish that the tanks were not leaking before evaluating the suitability for upgrading. (8.1)</td><td>□ Tanks were assessed by a leak detection system to establish that they were not leaking. (5.2.1)
□ A tightness test or another release detection system in accordance with NFPA 329 was used. Any release detection must have been capable of detecting a leak from any portion of the tank that routinely contains product and have been independently evaluated and certified in accordance with ASTM E 1526 or the equivalent. Leak detection results were provided to the corrosion specialist/cathodic protection specialist. (5.2.2)
□ Release detection testing was accomplished within 6 months prior to performing any of the assessment procedures. (5.2.3)</td></tr>
</table>

Former Emergency Standard ASTM ES 40 (Not Available)	ASTM Standard Guide G 158
Preliminary Site Survey	
□ Site specific information was obtained by a corrosion tester who was under the direction of the corrosion expert. (8.2)	□ Site specific information was obtained by a corrosion technician who was under the responsible direction of the corrosion specialist/cathodic protection specialist. (8.1) □ A preliminary site survey was performed pursuant to section 8 and a tightness test was performed pursuant to 5.2 to establish the fact that the tank was not leaking. (8.2)
Non-invasive (statistical modeling only)	
□ Tests were conducted by or under the responsible supervision of a corrosion expert. (9.1.2) □ Stray currents were tested. (9.1.3.1) □ Tank locations, materials of construction, capacity, and dimensions were confirmed and a detailed site sketch produced. (9.1.3.2) □ The presence & extent of corrosion immediately below fill riser was determined using a test probe equipped with a mechanical sensor tip. (9.1.3.2) □ Borehole tests were conducted. (9.1.3.3) □ Corrosion expert considered additional tests (current requirement, coating resistance, and coating efficiency). (9.1.3.4) □ Soil samples were sent to a qualified soil lab and tested in accordance with recognized industry test methods. At minimum, soil resistivity/conductivity, moisture content, soil pH, chloride ion concentration, and sulfide ion concentration data were obtained. (9.1.4) □ Corrosion expert considered performing and evaluating the following tests: hydrocarbon concentration, redox potential, sulfate ion concentration. (9.1.5) □ 1 soil sample of every 10 was subjected to independent QC analysis. All samples were reanalyzed since the last successful QC analysis if QC analysis failed. (9.1.6) □ The basis for analysis was followed. (9.2.1)	□ Tests were conducted by or as directed by a corrosion specialist or cathodic protection specialist. (9.1.1) □ A test for stray currents was done per certain specifications. (9.1.2.1) □ All tanks were located and materials of construction, age, capacity, and dimensions were confirmed. Detailed site sketches were produced. (9.1.2.2) □ The presence & extent of corrosion immediately below fill riser was determined. Any corrosion > 50% of tank wall thickness failed the tank. (9.1.2.2) □ Electrical continuity of tanks and piping was determined. (9.1.2.2) □ Borehole tests were conducted per certain specifications. (9.1.2.3) □ Soil samples were sent to a qualified soil lab and tested in accordance with EPA SW 846, ASTM E 1323, or other recognized industry test methods. At minimum, soil resistivity/ conductivity, moisture content, soil pH, soluble chloride ion concentration, and sulfide ion concentration data were obtained. The report included the results of all test methods used in the evaluation. (9.1.3) □ Corrosion specialist/cathodic protection specialist considered performing tests & evaluating redox potential, sulfate ion concentration, and any other test required by the external corrosion rate analysis model. The report included all test methods used in the evaluation. (9.1.4) □ 1 soil sample of every 10 was subjected to independent QC analysis. All samples were reanalyzed since the last successful QC analysis if QC analysis failed. (9.1.5) □ The statistical analysis model reached a confidence level of 0.99. (9.2.1)

Former Emergency Standard ASTM ES 40 (Not Available)	ASTM Standard Guide G 158
□ Procedure was based on an evaluation of all data gathered. (9.2.2.1) □ Mathematical formulation conformed to accepted physical and electrochemical characteristics of tank corrosion process. (9.2.2.2) □ Parameter estimates were based on minimum of 100 sites and 200 tanks which were excavated and evaluated by a qualified corrosion expert. A procedure that met standards of statistical /electrochemical admissibility was used. Data were representative of leaking and nonleaking tanks. (9.2.2.3) □ Standard deviation of predicted time to corrosion failure was not > 1.5 years. Model generated a probability of corrosion failure based on a comparison of actual tank age to expected leak-free life. (9.2.2.4) □ Models proposed were specific to soil type & incorporated GW depth & rainfall experienced in the immediate geographical area where testing occurred. (9.2.2.5) □ Report conclusions were based on the expected leak-free life of a tank at a specific site as determined by analysis of the data necessary to determine which tanks were suitable for upgrading with CP. (9.2.3.1) □ Report provided the expected leak-free life and present and future probabilities of corrosion failure for all tanks investigated. (9.2.3.2) □ Report included a listing of tanks whose age was < the expected leak-free life where the probability of corrosion perforation was < 0.05. (9.2.3.3) □ Probability of corrosion failure was < 0.05. (9.2.3.4 and 9.2.3.5) □ For tanks 10 years old and older, the leak detection test that was performed before the tank was assessed was repeated approximately 6 months after cathodic protection was added to ensure its continued leak-free condition. (9.2.3.5)	□ Procedure was based on an evaluation of all data gathered. (9.2.2.1) □ Mathematical formulation conformed to accepted physical and electrochemical characteristics of tank corrosion process. Independent professional validation was completed. (9.2.2.2) □ Parameter estimates were based on minimum of 100 sites and 200 tanks which were excavated and evaluated by a qualified corrosion specialist/cathodic protection specialist. Procedure that meets standards of statistical /electrochemical admissibility was used. Data were representative of leaking and nonleaking tanks. (9.2.2.3) □ Models proposed were specific to soil type & incorporated GW depth & rainfall experienced in the immediate geographical area where testing occurred. (9.2.2.5) □ Standard deviation of predicted time to corrosion failure was not > 1.5 years. Model generated an unconditional probability of corrosion failure. based on a comparison of tank age to expected leak-free life. (9.2.2.5) □ Report conclusions were based on the expected leak-free life of a tank at a specific site as determined by analysis of the data necessary to determine which tanks were suitable for upgrading with CP. (9.2.3.1) □ Report provided the expected leak-free life and present and future probabilities of corrosion failure for all tanks investigated. (9.2.3.2) □ Report included a listing of tanks whose age was < the expected leak-free life and where the probability of corrosion perforation was < 0.05. (9.2.3.3) □ Tank was leak free. (9.3.1) □ Tank age was less than the expected leak free life. (9.3.2) □ Probability of corrosion perforation of the tank was < 0.05 (9.3.3) □ Tank tightness test was conducted 3 to 6 months after CP was added or monthly monitoring with another leak detection system was implemented within 1 month after CP was added. Leak detection system met section 5.2.2. (9.3.4) □ Authenticated vendor-provided information was reported using the form in the Annex. (9.4)

Former Emergency Standard ASTM ES 40 (Not Available)	ASTM Standard Guide G 158
Invasive Ultrasonic Thickness Testing with External Corrosion Evaluation	
□ Tests were conducted by or under the responsible supervision of a corrosion expert. (10.1.3) □ Stray current corrosion/interference was tested for. (10.1.4) □ Soil resistivity was measured according to Wenner 4 pin method or NACE RP-0285. (10.1.5) □ Structure-to-soil potentials were measured according to RP-0285 with at least 1 potential measurement was made over each tank at the midpoint or end of all metallic components connected to the tank. (10.1.6) □ Soil pH was measured. (10.1.7) □ Electrical continuity/isolation tests were conducted (NACE RP-0187). (10.1.8) □ Additional tests were considered by the corrosion expert. (10.1.9) □ Tanks ten years old or older successfully passed the tests provided for in sections 8 and 10. (10.1.10) □ Corrosion tester performing robotic tests was properly certified. (10.2.1) □ Interior surface of tank was uniform and free of loose scale, paint, dirt, and other deposits that affect examination (according to ASTM E 114). (10.2.3) □ Thickness measurement sensor was calibrated (using ASTM E 797). (10.2.4) □ Couplant used was stored product or compatible with product stored & was appropriate for the surface finish of the examined material. Surface finish/ couplant was acoustically similar to those of the tank & couplant therein. (10.2.5) □ Discrete, located measurements were taken on at least 15 % of the entire tank interior surface (excluding access ways). Additional measurements were made in areas where corrosion was more severe. (10.2.6.1)	□ Tests were conducted by or as directed by the corrosion specialist/cathodic protection specialist. (10.1.2) □ Stray currents were tested for as specified in 9.1.2.1. (10.1.3.1) □ Soil resistivity was measured in accordance with ASTM G 57. (10.1.3.2) □ Structure-to-soil potentials were made using NACE RP-0285, with at least 5 such measurements spaced uniformly about each tank excavation zone. (10.1.3.3) □ Soil pH according to ASTM G 51 and soil chlorides & sulfides according to EPA SW 846 were uniformly gathered from 3 locations about each tank excavation zone. (10.1.3.4) □ Electrical continuity/isolation tests were conducted according to NACE RP-0285 at each UST. (10.1.3.5) □ Corrosion technician that performed robotic tests met certain certification and qualification requirements. (10.2.2) □ Interior surface of tank was uniform and free of loose scale, paint, dirt, and other deposits that affect examination (according to ASTM E 114). (10.2.3) □ Thickness measurement sensor was calibrated (using practice ASTM E 797). (10.2.4) □ Couplant used was stored product or compatible with product stored & was appropriate for the surface finish of the examined material. Surface finish/ couplant was acoustically similar to those of the tank & couplant therein. (10.2.5) □ Wall thickness measurements were made on at least 15% of the tank interior surface (excluding access ways). Thickness measurements were uniformly distributed over the surface of the tank. (10.2.6.1) □ Equipment was capable of accessing at least 95% of the interior surface area. Additional measurements were made (as determined by corrosion specialist/cathodic protection specialist) in areas where corrosion was more severe. (10.2.6.1) □ The maximum allowable position error in each wall thickness measurement position location coordinate was 5% of the maximum tank dimension. (10.2.6.3)

Former Emergency Standard ASTM ES 40 (Not Available)	ASTM Standard Guide G 158
□ The following data were recorded: operator name and certification level, instrument description (make, model, S/N, and setup couplant), instrument calibration certification (including date performed), cable type and length, scanning mode, search unit description, reference standards, location data for thickness measurement points. (10.2.7) □ Robotic inspection device was capable of entering tank through an existing entry and was versatile enough to traverse 95% of the tank interior (excluding access ways). (10.2.8.1) □ For automated scanning, the search unit was held by a suitable fixed device while the search unit moved mechanically along a predetermined path within the tank in accordance with ASTM E 114. (10.2.8.2) □ The robotic inspection device was able to free the interior surface of rust, loose scale, paint, and other deposits to ensure a clean surface for ultrasonic inspection. (10.2.8.3) □ The robotic inspection system was safe for operation and compatible with the stored product. (10.2.9) □ A prediction model which used thickness measurement test data and soil chemistry data was used to forecast when each tank was expected to leak. The prediction model yielded the years of leak-free life remaining and the probability of a potential leak of the tank in a specific soil condition. The model was based on tank inspection data and included all of the data listed in 10.1.3 through 10.1.8 and any tests performed in 10.1.9. The mathematical formulation was based on accepted physical and electrochemical characteristics of the tank corrosion process. (10.3.2.1) □ There was no pitting greater than 50% of the minimum recommended wall thickness. The average wall thickness of each square meter was > 85% of the original wall thickness. The results of the prediction model, as determined by the corrosion expert, supported that CP was both reasonable and viable. (10.3.2.2) □ The inspection report summarized all tank data collected from the inspection and provided results from the prediction model for each tank, including recommendations w.r.t. the tank's suitability for upgrading with CP. The corrosion expert was responsible for all data analysis and recommendations. (10.3.3)	□ The following data were recorded: operator name and certification level, instrument description (make, model, S/N, and setup couplant), instrument calibration certification (including date performed), cable type and length, scanning mode, search unit description, reference standards, location data for thickness measurement points. (10.2.7) □ The user of this standard established appropriate safety and health practices and determined the applicability or regulatory limitations prior to use. (10.2.8) □ A prediction model was used to determine the probability of an individual tank leak due to corrosion. The model yielded the years of leak-free life remaining and the probability of a potential leak of the tank in a specific soil condition. It was based on tank inspection data collected and included all of the site specific parameters in sections 10.1.3.1 through 10.1.3.5 along with any tests performed in 10.1.4. The mathematical formulation was based on accepted physical/electrochemical characteristics of tank corrosion process. (10.3.2.1) □ There was no measured pitting which perforated the tank wall. 98% of all thickness measurements were > or equal to 50% of the minimum recommended wall thickness as provided in UL 58 or the documented original wall thickness. The average metal wall thickness of each square meter was >85% of the original wall thickness. The prediction model results, as determined by the corrosion specialist/cathodic protection specialist, supported that CP was both reasonable and viable. (10.3.2.2) □ The inspection report summarized all tank data collected from the inspection and provided results from the prediction model for each tank, including recommendations w.r.t. the tank's suitability for upgrading with CP. The corrosion specialist/cathodic protection specialist was responsible for all data analysis and recommendations. (10.3.3) □ The tank passed all requirements defined in 10.3.2.2. (10.4.1) □ Tank tightness test was conducted 3 to 6 months after CP was added or monthly monitoring with another leak detection system was implemented within 1 month after CP was added. Leak detection system met section 5.2.2. (10.4.2) □ Authenticated vendor-provided information was reported using the form in the Annex. (10.5)

Former Emergency Standard ASTM ES 40 (Not Available)	ASTM Standard Guide G 158
Invasive permanently recorded visual inspection and evaluation including external corrosion assessment	
□ Tests were conducted by or under the responsible supervision of a corrosion expert. (10.1.3) □ Stray current corrosion/interference was tested for. (10.1.4) □ Soil resistivity was measured according to Wenner 4 pin method or NACE RP-0285. (10.1.5) □ Structure-to-soil potentials were measured according to RP-0285 with at least 1 potential measurement made over each tank at the midpoint or end of all metallic components connected to the tank. (10.1.6) □ Soil pH was measured. (10.1.7) □ Electrical continuity/isolation tests were conducted (NACE RP-0187). (10.1.8) □ Additional tests were considered by the corrosion expert. (10.1.9) □ Tanks ten years old or older successfully passed the tests provided for in sections 8 and 10. (10.1.10) □ The person performing the inspection was a corrosion tester. The analysis of any suspect corrosion activity that may fail a tank was conducted by a corrosion expert. (10.4.3) □ Field and laboratory testing was completed either prior to or in conjunction with performing internal video tank inspection. If the field and lab testing revealed any indication of structural or electrochemical characteristics that were incompatible with the effective use of CP, then the tank was failed and internal inspection aborted. (10.4.4) □ The tank was emptied, cleaned, and purged prior to conducting the internal video inspection. (10.4.5 - 10.4.8.1)	□ Tests were conducted by or as directed by the corrosion specialist/cathodic protection specialist. (11.1.2) □ Stray currents were tested as specified in 9.1.2.1. (11.1.3.1) □ Soil resistivity was performed in accordance with ASTM G 57 at certain depths. (11.1.3.2) □ Structure to soil potentials were made using NACE RP-0285 with at least 5 such measurements spaced uniformly about each tank excavation zone. (11.1.3.3) □ Soil pH according to ASTM G 51 and soil chlorides and sulfides according to EPA SW846 and ASTM E 1323 were uniformly gathered from 3 locations about each tank excavation zone. (11.1.3.4) □ Electrical continuity/isolation tests were conducted according to NACE RP-0285 at each UST being evaluated. (11.1.3.5) □ The person performing the inspection was a corrosion technician. The corrosion specialist/cathodic protection specialist conducted an analysis of any suspect corrosion activity that may have failed the tank. (11.2.3) □ The field and laboratory testing was completed either prior to or in conjunction with performing the internal visual inspection. If these tests revealed any indication of structural or electrochemical characteristics that were incompatible with the effective use of CP, the tank was failed and the internal visual inspection was aborted. (11.2.4) □ Prior to conducting the internal visual inspection, the tank was emptied, cleaned, if necessary, and purged. (11.2.5 - 11.2.8.1) □ The "in-tank" visual recording system had lighting capable of adequately illuminating the interior steel surfaces so the defect sizes defined in 11.2.10.1 could be visually observed and permanently recorded. (11.2.9)

Former Emergency Standard ASTM ES 40 (Not Available)	ASTM Standard Guide G 158
□ The lighting equipment was capable of illuminating interior steel surfaces having an area of 12 sq ft at 30 ft from the camera. The intensity of the lighting was adjustable to accommodate the visual/video inspection within 2.5 ft of the camera. The lighting system had a minimum rating of 900 candle power. (10.4.9) □ Video camera has interchangeable lenses or zoom lens capable of focusing on surfaces from 2.5 through 30 ft away from the camera. The camera/lens/video system had sufficient viewing clarity at the maximum tank-surface-to-lens distance to identify pits or corrosion by-product tubercles having a diameter of 1/8 inch or more. The typical minimum viewing fields were 11 inches horizontal by 8 inches vertical at a distance of 5 ft and 22 inches horizontal by 18 inches vertical at 30 ft. (10.4.10.2) □ The video camera/system had certain minimum specified properties. (10.4.10.2) □ Camera focusing and light intensity were controlled remotely. The controls were capable of focusing and lighting to produce a clear sharp monitor image with sufficient contrast to identify (and tape) suspected corrosion activity throughout interior surfaces of the tank. (10.4.10.3) □ The remote-control drive mechanism was capable of the following: raising/lowering within 95% of the tank diameter, rotating right/left 360 degrees, rotating the camera tilt angularly up/down from direct down view to 135 degrees up from vertical, and identifying the direction of view. (10.4.11) □ The video monitor had (at minimum): a high-resolution industrial-grade color monitor with 9 inch diagonal color screen, resolution and clarity to be compatible with the video camera, and capability of identifying corrosion activity listed in the emergency standard. The unit included a high-resolution industrial-grade video recording system with audio microphone and audio tract capabilities. The recording system had standard video recording controls, including programmable clock/timer and an integrated video typewriter with memory. The system had the capability of superimposing both voice override and typed text on the video tape. (10.4.12) □ All interior tank surfaces were scanned with a medium-focal-length lens/zoom to assess the general inspection conditions and ensure the tank was sufficiently clean to permit effective video inspection. (10.4.13.1)	□ The visual inspection method identified and permanently recorded the presence of all detectable pits or corrosion by-products tubercles while observing and permanently recording the condition of at least 98% of the tank's interior surfaces. (10.2.10.1) □ The minimum resolution of the visual recording system was capable of identifying the location and degree of corrosion activity as listed in 11.2.10.1. The system permanently embedded the time, structure site, UST location and date of the visual examination in the visual record. It provided for permanently recording the observation comments of the visual inspector. (11.2.11) □ The inspection was made by a qualified technician working under the supervision of the responsible corrosion specialist/cathodic protection specialist according the following minimum requirements. (11.2.12) □ All interior surfaces were scanned to assess the general inspection conditions and to ensure the tank was sufficiently clean to permit effective visual inspection. (11.2.12.1) □ Date, time, and all necessary tank identification data (including company/ address, project ID, tank size, age, and ID number, and corrosion technician's name) were recorded at the start of the recording process. (11.2.12.2) □ The visual corrosion condition on at least 98% of the internal tank surfaces was systematically performed. (11.2.12.3) □ All pertinent or unique observations, corrosion activity or damage, and location relative to the internal tank surface observed by the corrosion technician were permanently recorded. (11.2.12.4) □ A commentary summation of the corrosion technician was permanently recorded. (11.2.12.5) □ The corrosion technician identified any evidence of corrosion. (11.2.13) □ The report indicated if no corrosion or deterioration was evident. (11.3.1) □ The corrosion specialist/cathodic protection specialist viewed the visual permanent record and made final determination on the suitability of each tank tested for upgrading. (11.3.2) □ A report was prepared and submitted to the O/O by the corrosion specialist/cathodic protection specialist after review of the permanent visual record. The report contained the upgrading suitability determination made for each tank. The report was kept on file by the O/O as part of required documentation. (11.3.3)

Former Emergency Standard ASTM ES 40 (Not Available)	ASTM Standard Guide G 158
□ The following were both typed in and recorded verbally at the start of the recording: date, time, and all necessary tank ID data (including company name/address, project ID number, tank size, age, and ID number, and technician's name). (10.4.13.2) □ The camera was moved systematically to record visual inspection of the internal tank surfaces. Zoom-in (or appropriate lenses) was employed to explore any suspected corrosion sites. (10.4.13.3) □ Voice override and text input was used for notations on any unique observation, corrosion activity, or damage along with the location relative to the internal tank surface. (10.4.13.4) □ Summation commentary and recommendations noting "end" of inspection using both voice and text input were added. (10.4.13.5) □ Corrosion tester identified any evidence of corrosion. (10.4.14) □ The report indicated if no corrosion or deterioration was evident. (10.5.1) □ The corrosion expert reviewed the video record and made a final suitability determination of each tank tested for upgrading. (10.5.2) □ The corrosion expert submitted a report to the O/O after reviewing the video record (including both typed-in and voice override notations and comments) which included the upgrading suitability determination made for each tank. The video record and report were kept on file by the O/O as part of the required documentation. (10.5.3) □ If significant evidence of a perforation or corrosion was confirmed by the corrosion expert or if the corrosion expert's analysis of the site environmental data indicated the tank was not a candidate for cathodic protection, the O/O was advised that the tank was not acceptable for upgrading by CP and that other options should be considered, such as repair, replacement, additional tests/inspections, or closure. (10.5.4) □ For tanks 10 yrs old or older, CP was applied only after testing in accordance with sections 8 and 10 with the tank found to be leak free. The leak detection test was performed again approximately 6 months after adding CP for tanks that were 10 yrs old or older to ensure the tank's continued leak-free condition. (10.5.5)	□ Any evidence of perforation or significant corrosion was confirmed by the corrosion specialist/cathodic protection specialist or by her or his analysis of the site corrosion data which indicated the tank was not a candidate for upgrading by CP alone. (11.3.4) □ Either: (1) A prediction model was used to determine the probability of an individual tank leak due to corrosion. The model yielded the years of leak-free life remaining and the probability of a potential leak of the tank in a specific soil condition. It was based on tank inspection data collected and included all of the site specific parameters in 11.1.3 through 11.1.3.5 along with any tests performed in 11.1.4. The mathematical formulation was based on accepted physical/electrochemical characteristics of tank corrosion process. (10.3.5.1) The tank was considered suitable for upgrading if: the results of the prediction model, as determined by the corrosion specialist/cathodic protection specialist, supported that CP was both reasonable and viable (11.3.5.1) or (2) If a statistical prediction model was not used, tanks were not considered suitable for upgrade with CP if any of the following values were as follows: soil resistivity at the average tank depth < 700 ohm-cm, soil pH < 4.0, soluble chloride ion concentration > 500 ppm, positive sulfide test indicating the presence of sulfate-reducing bacteria according to EPA SW 846, average tank-to-soil potential on the UST is more positive than minus 300 mV with respect to a saturated copper/copper sulfate electrode. (11.3.5.2) □ Tanks tested and found to be leak free and found acceptable for upgrading according to sections 8 and 11 and meeting the criteria defined in section 11.3.4 together with either section 11.3.5.1 or 11.3.5.2 could be upgraded with cathodic protection (11.4.1) □ Tank tightness test was conducted 3-6 months after CP was added or monthly monitoring with another leak detection system was implemented within 1 month after CP was added. Leak detection system met section 5.2.2. (10.4.2) □ Authenticated vendor-provided information was reported using the form in the Annex. (10.5)

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Compliance Options for Tank Leak Detection and Integrity Assessment

September 14, 1998

The detailed table below is intended for implementing agencies, which may share its contents with owners and operators. The table shows what types of tank leak detection methods and alternative (without human entry) integrity assessment methods meet both EPA regulations **and** the requirements of implementing agencies that have followed EPA guidance on integrity assessment. Leak detection for piping is **not** addressed. Responses in the 1st and 2nd columns do not depend on the date that an assessment was done. If any of the conditions in the first 4 columns change, then skip to the appropriate row. Remember that tanks can always use monthly leak detection monitoring under 280.43(b) through (h).

If your agency follows EPA guidance, when conditions match these,				then for compliance the **tank** can use:		
Was **tank** installed with corrosion protection or was cathodic protection added (and if so, when)?	Does **piping** have corrosion protection and is spill and overfill protection in place?	If upgraded, is assessment 1 of following: human-entry inspection, leak detection for tanks less than 10 years old at the time, or meeting Option A or B*?	If upgraded with cathodic protection, did assessment procedure meet former ASTM ES 40?	Alternative integrity assessment (for compliance w/ 12/22/98 upgrade req't)	For Leak Detection: Inventory Control (or, if applicable, Manual Tank Gauging) + Tightness Testing, at least	
					Annually	Every 5 Years
N	Y or N	Y or N	Not App.	Not App.	Through 12/22/98	N
Y (anytime)	N	N	N	N**	Through 12/22/98	N**
		N	Y	Y **if** done on or before 3/22/98; N if after	N	N
		Y	Y or N	Y	Through 12/22/98	N
Y (**on or before** 12/22/88)	Y	N	N	N**	Through 12/22/98	N**
		N	Y	Y **if** done on or before 3/22/98; N if after	N	N
		Y	Y or N	Y	-->	Thru 12/22/98
Y (**after** 12/22/88)	Y	N	N	N**	Through 12/22/98	N**
		N	Y	Y **if** done on or before 3/22/98; N if after	N	N
		Y	Y or N	Y	--->	10 yrs after tank upgraded w/ corr. prot.

* Option A or B (from EPA's 7/25/97 guidance): Option A is accordance with a current standard code of practice developed by a nationally recognized association or independent test lab. In Option B, a procedure must meet certain performance criteria in a third-party evaluation (see the "List of Integrity Assessment Evaluations," available from EPA OUST, for example procedures).

** Unless an alternative integrity assessment method was determined by implementing agency to be no less protective under 40 CFR 280.21(b)(2)(iv), the assessment method and thus the upgrade do not meet 12/22/98 standards.

Flyer Designed For UST Owners

Those UST owners who face the decision of choosing which integrity assessment procedure to use should be made aware that they will need proof that their choice of an alternative integrity assessment meets compliance requirements. We will use variations of the "canned language" below to alert UST owners to this issue—we hope you will do the same in your newsletters or other periodic communications with UST owners you are involved with.

Owners Upgrading USTs:
Make Sure Your Alternative Integrity Assessment Has "Integrity"

Before you upgrade a steel underground storage tank (UST) with cathodic protection, make sure that the procedure your contractor uses to assess the tank's integrity is acceptable. To find out which procedures are acceptable, check with the government agency that implements the UST program in your area (usually your state environmental agency). Most implementing agencies have followed the U.S. Environmental Protection Agency's recommendation to allow contractors to use alternative integrity assessment procedures only if they can provide you with at least one of the following:

- Written proof that the standard operating procedure used conforms to a national code of practice. The current code is ASTM G 158, but check with your implementing agency to see if any other codes are currently acceptable.

- A signed independent third-party evaluation that shows the procedure has been able to detect 95% of unsuitable representative USTs in a blind evaluation.

With one or both of these evidences of "proof," you can make sure the hard-earned dollars you spend on upgrading will bring

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460
Mail Code 5401G

JUN 25 1998

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Guidance Regarding the ACT-100-U® Tank Technology

FROM: Anna Hopkins Virbick, Director
Office of Underground Storage Tanks

TO: State UST Program Managers
EPA Regional Program Managers

Introduction

Pursuant to a request from the Steel Tank Institute (STI), the Environmental Protection Agency (EPA) is providing guidance regarding a newer composite tank technology called the ACT-100-U®. This technology is similar to the new tank standard at 40 CFR § 280.20(a)(3) which describes one acceptable tank as being constructed of a steel-fiberglass-reinforced-plastic composite. The difference with the ACT-100-U® technology is that it is constructed of a steel-polyurethane composite. Therefore, the newer ACT-100-U® technology does not meet the regulations at § 280.20(a)(3) because the cladding is not fiberglass-reinforced-plastic (FRP). However, when the underground storage tank (UST) regulations were written, flexibility for new and emerging tank technologies was provided for at § 280.20(a)(5). It is here where the ACT-100-U® tank technology may fit into the UST regulations.

Recommendation

EPA recommends that implementing agencies determine that the ACT-100-U® tank technology is designed to prevent the release or threatened release of any stored regulated substance in a manner that is no less protective of human health and the environment than those tanks already specifically listed in the regulations.

Discussion

EPA recommends that implementing agencies make this determination based upon the following information:

1. Underwriters Laboratories (UL) Listing

The ACT-100-U® has received a third party listing issued by UL (see attachment 1) dated 6/5/96 as a coated composite tank for flammable liquids (UL 1746). The tank is fabricated by coating a tank listed under UL 58 with a polyurethane coating. The coating material passed the same tests as the ACT-100® FRP coating under UL 1746 part II requirements. Note: UL is in the process of finalizing testing criteria (to be called UL 1746 part IV) specific to ACT-100-U® coating. The following tests were performed by UL on coupon samples containing a minimum 70 mil thick polyurethane coating:

Accelerated Air Oven Aging Testing
Immersion Testing
Light and Water Exposure Testing
Abrasion Resistance Testing
Impact and Cold Exposure Testing
Corrosion Evaluation Testing
Identification Testing
Strength of Pipe Fittings Testing (both bending moment and torque)
Strength of Lift Fittings Testing
Tank Impact Testing
Tank Examination and Holiday Testing

2. ACT-100-U® Specification

STI has prepared an ACT-100-U® Specification for External Corrosion Protection of Composite Steel Underground Storage Tanks (see attachment 2). The purpose of this specification is to establish ACT-100-U® production procedures which are fully supported by quality assurance measures and proper installation requirements. The specification contains information regarding a specific method of underground external corrosion control for steel tank. It includes requirements for fabrication and performance, electrical isolation, approved resins, and cladding application.

3. Installation Instructions

STI has written installation instructions (see attachment 2, appendix K) which are specific to the ACT-100-U® tank technology. These instructions provide for the inspection and repair of any coating damage, electrical isolation of the tank, and detailed instructions for the installation of the tank.

4. Side-By-Side Comparison of ACT-100-U® with ACT-100® (National Association of Corrosion Engineers (NACE) International Paper No. 583 Presented at the Corrosion 97 Conference)

A paper (see attachment 3) titled "21st Century Underground Steel Tank Protection Today" was presented at the NACE International Conference in 1997. This paper provides information regarding the testing of the polyurethane coating along with a side-by-side comparison of the ACT-100® and ACT-100-U® tank technologies. One Environmental advantage that the paper discusses for the ACT-100-U® is that the polyurethane coating is 100% solids and does not contain amines, styrenes, or volatile organic compounds (VOCs).

Note: The NACE paper contains some information regarding cathodic disbondment resistance and flexibility for the polyurethane coating. This information was obtained from UL testing conducted in 1993 (see attachment 4) on coating samples that ranged from 12 to 31 mils in thickness and is not part of the UL 1746 listing.

Please contact Paul Miller of my staff via E-mail at miller.paul@epamail.epa.gov or phone at (703) 603-7165 if you have questions regarding this guidance.

Attachments (4)

cc (w/o attachments): Wayne Geyer, Steel Tank Institute
David Wiley, OUST
OUST Management Team

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460
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AUG 5 1998

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Clarification and Guidance Regarding Cathodic Protection/Monitoring of Double-walled Steel USTs

FROM: Anna Hopkins Virbick, Director
Office of Underground Storage Tanks

TO: State UST/LUST Program Managers
Regional Program Managers

Introduction

On July 18, 1991, a technical interpretation was issued from this office (attached) to Mr. Charles Frey of the Highland Tank and Manufacturing Company regarding, in part, the issue of whether or not the federal regulations at 40 CFR Part 280 require cathodic protection (CP) monitoring of double-walled underground storage tanks (USTs), where both walls are made of steel. Since its issuance, this correspondence has generated some confusion and concern. Today's memorandum clarifies the Environmental Protection Agency's (EPA's) position on this matter and provides guidance to implementing agencies.

Discussion

A. Corrosion protection

The July 18, 1991 letter appears to have left some readers with the incorrect impression that double-walled steel tanks are not required to have corrosion protection. It is EPA's position that **all** tanks, including double-walled steel tanks, must be protected from corrosion according to the federal regulations for new tanks at § 280.20 and for existing tanks at § 280.21. This position is supported by the regulatory language at § 280.20(a) which states:

> Each tank must be properly designed and constructed, and any portion underground that routinely contains product must be protected from corrosion....

By saying "any portion underground," the regulations are referring to any portion **<u>of the tank</u>** that is underground. A double-walled tank has an inner and outer wall, both of which are considered part of one single tank. Therefore, any portion of the tank (meaning both the inner and outer wall in the case of a double-walled tank) that is underground and routinely contains product must be protected from corrosion. A steel inner wall is protected from corrosion by an intact outer wall, while the outer wall is protected from corrosion using one of the methods listed at § 280.20(a). This position is also supported by § 280.21 which requires all existing tanks that do not meet new tank standards or closure requirements to add corrosion protection by December 22, 1998. Corrosion protection options for existing steel tanks include internal lining, cathodic protection, and internal lining combined with cathodic protection.

<u>B. Cathodic Protection Monitoring With Respect to Inner and Outer Tank Walls</u>

In addition, the July 18, 1991 letter to Mr. Frey of Highland Tank discusses CP monitoring with respect to inner and outer tank walls — the outer wall is in contact with the ground while the inner wall routinely contains product. The letter states:

> In a double-walled steel tank the inner wall of the structure contains the product but it is protected from external corrosion by the outer wall. **Thus, cathodic protection monitoring of the outer wall is not required under EPA regulations**.

(emphasis added).

The second sentence of the above statement is incorrect. For a cathodically protected double-walled steel tank, the inner wall is protected from corrosion by the outer wall while the outer wall is protected from corrosion by the cathodic protection system. It is the EPA's position that both inner and outer walls are part of a single UST system. According to § 280.31(b):

> All UST systems equipped with cathodic protection systems must be inspected for proper operation by a qualified cathodic protection tester in accordance with the following requirements....

The requirements discussed following this statement in the regulations include the test conducted within six months of installation and every three years thereafter and 60 day inspections of impressed current systems. Therefore, since the outer wall of a double-walled tank with cathodic protection is part of the UST system, that cathodic protection **<u>must</u>** be inspected for proper operation in accordance with § 280.31.

<u>C. Cathodically Protected Double-Walled Steel Tanks with Interstitial Monitoring</u>

The issue that prompted Highland Tank to approach the EPA was whether the protection afforded by the triennial CP monitoring requirement at § 280.31(b) could be achieved in an alternative way for cathodically protected double-walled steel tanks. Its position was that using interstitial monitoring for release detection on a cathodically protected double-walled tank should be accepted by EPA as a technically equivalent substitute. It pointed out that the inner wall of a protected double-walled tank is shielded from external corrosion by the protected and coated outer wall, and in the unlikely event that corrosion should breach the outer wall, it would be detected by the interstitial monitoring system before external corrosion could significantly damage the inner, primary-containment wall. Highland Tank's basic justification for this position was its belief that these tanks are more protective than cathodically protected single-walled steel tanks and that CP monitoring was unnecessary and duplicative when interstitial monitoring was used with the double-walled tank.

EPA agrees that cathodically protected double-walled steel tanks with interstitial monitoring capable of detecting a breach in both the inner and outer wall are very protective of human health and the environment. Therefore, we reviewed the language in the regulations to determine whether cathodic protection monitoring flexibility was allowed in this case. The following are our findings.

> One of the regulatory requirements for steel tanks with cathodic protection is that CP systems are operated and maintained according to § 280.31 or according to guidelines established by the implementing agency (§ 280.20(a)(2)(iv)). In addition, § 280.31(b)(1) requires all UST systems equipped with CP be tested within six months of installation and at least every three years thereafter or according to another reasonable time frame established by the implementing agency. These requirements apply to both new and existing UST systems. In addition, implementing agencies are given the flexibility to establish guidelines alternative to those specifically listed in the regulations.

Based on these findings, EPA recommends that implementing agencies use this flexibility and establish the following criteria and guideline.

If an UST meets **<u>all</u>** of the following criteria:

1. Double-walled tank, both walls made of steel.
2. Cathodically protected.
3. Interstitial monitoring capable of detecting **<u>one</u>** of the following:
    a) a breach in the inner and outer tank walls.
    b) an ingress of product and water into the interstitial space.

Examples of interstitial monitoring which satisfy the third criterion are a vacuum monitor, a liquid-filled interstice with level monitoring, a float sensor that reacts to both water and product, or monthly manual sticking of the interstice. An example of interstitial monitoring which does not satisfy the third criteria is a sensor capable only of detecting either product (like many vapor sensors) or water. Different sensors can be combined to meet the criterion.

Then apply the following guideline:

> Require the CP monitoring time frame to be within six months of installation of the CP system and after any activity that might affect the CP system (some examples include but are not limited to: retrofit activity, excavation close to the UST, or maintenance that might affect the rectifier).
>
> Note: This guideline applies to new tank installations and to existing tanks that meet the criteria listed above and have at least one cathodic protection monitoring event as specified at § 280.31(b). For those tanks that have never been subjected to a cathodic protection monitoring event, EPA recommends that a monitoring event be performed according to § 280.31(b) prior to applying this guideline.

If any one of the criteria are no longer met, then this recommendation no longer applies and triennial monitoring of the cathodic protection system is necessary.

The initial monitoring of the CP system ensures that the UST system is being protected from corrosion following installation while monitoring after any activity that could affect the CP system addresses any potential problems that occurred because of that activity. Implementing agencies have the flexibility to determine the specific activities that would trigger a monitoring event. In addition, the interstitial monitoring will detect a wall breach or ingress of product and water, allowing the problem to be fixed before any regulated substance can be released into the environment. EPA cannot recommend the guideline of "no monitoring" for a CP system on a double-walled steel tank because we do not believe that "no monitoring" can be considered "another reasonable time frame," which is specified at § 280.31(b)(1). Please note that the 60-day inspection requirement for impressed current CP systems is still required because it falls under a different section of the regulations (§ 280.31(c)).

EPA believes that periodic monitoring of cathodic protection systems on all steel USTs is a good tank management practice. However, we do not believe that significant additional protection to human health and the environment is gained by requiring cathodic protection monitoring every three years on tanks that meet the criteria described in this recommendation.

Summary

The following summarizes the key points in this memorandum:

1. Corrosion protection is required for all USTs.

2. The inner and outer walls of a tank are considered part of a single UST system and any cathodic protection attached to the outer wall must be inspected for proper operation according to the regulations at § 280.31.

3. For cathodically protected double-walled steel tanks that use interstitial monitoring capable of detecting a wall breach or ingress of product and water, EPA recommends that implementing agencies use the flexibility allowed in the regulations and require the CP monitoring time frame to be within six months of installation and following any activity that could affect the CP system.

The above memorandum supersedes information contained in our previous regulatory interpretation regarding CP monitoring requirements for double-walled steel tanks dated July 18, 1991. Please contact Paul Miller of my staff via E-mail at miller.paul@epa.gov or phone at (703) 603-7165 if you have further questions regarding this matter.

Attachment

cc: Wayne Geyer, STI
OUST Management Team
David Wiley, OUST
Paul Miller, OUST
RCRA/UST Hotline

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 23, 1999

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Guidance Regarding Cathodic Protection Monitoring of ACT-100® and ACT-100-U® Underground Storage Tanks with Cathodic Protection

FROM: Anna Hopkins Virbick, Director /s/
Office of Underground Storage Tanks

TO: State UST Program Managers
EPA Regional Program Managers

Pursuant to a request from the Steel Tank Institute (STI), the Environmental Protection Agency (EPA) is providing guidance regarding the cathodic protection (CP) monitoring of two underground storage tank (UST) technologies. The ACT-100® and, where accepted by implementing agencies according to EPA guidance dated June 25, 1998, ACT-100-U® tank technologies meet new tank standards at § 280.20 without the addition of cathodic protection. These tanks are corrosion protected by an external cladding which provides a dielectric barrier between the steel tank and the environment. As long as the integrity of the cladding is maintained, the addition of anodes to these types of tanks at installation provides an additional level of corrosion protection that is beyond the minimum requirements described in the federal regulations.

STI recently published a supplement to the installation instructions dated March 1998 for the ACT-100® and ACT-100-U® tank technologies (see attachments) that provides specific instructions for attaching factory-attached and field-attached anodes. Factory-attached anodes must be attached per the requirements of the STI-P3® specification and weld-on anode core bars must be coated at the factory according to the ACT-100® or ACT-100-U® specifications. For field-attached anodes, the anode wire must be connected to the lift lug or something which by design is not in contact with stored product. Instructions for wire connections and splices are also included. EPA believes that the installation instruction supplements and specifications ensure the integrity of the cladding is maintained. Historically, the ACT-100® specification (as far back as 1989) required complete cladding coverage over the entire tank, any external attachments must be designed in a manner which does not preclude the proper application of the cladding material, and a spark test must be conducted over the entire surface of the tank after application of the cladding.

EPA believes that anytime CP is installed on an UST system, it should be operating properly. However, ACT-100® and, where accepted, ACT-100-U® tank technologies meet new tank standards without the addition of anodes. In addition, by following STI's March, 1998 installation instructions, tank manufacturers employ good tank management practices by requiring an initial test of the CP system and additional testing when construction or maintenance activity around the tank or anodes takes place.

Based upon the above discussion, EPA believes that monitoring of ACT-100® and, where accepted by implementing agencies, ACT-100-U® tanks with anodes should not be required. EPA recommends that implementing agencies determine the following for ACT-100® and, where accepted by implementing agencies, ACT-100-U® tanks:

Periodic monitoring of cathodic protection systems is not required in the following cases:

1. When factory installed anodes are included with a new ACT-100® or ACT-100-U® installation.

2. When field installed anodes are included with a new ACT-100® or ACT-100-U® installation.

Note: In cases where cathodic protection is retrofitted to a previously installed ACT-100® or ACT-100-U® tank, cathodic protection monitoring is required because the status of the cladding cannot be determined.

Please contact Paul Miller of my staff via E-mail at miller.paul@epa.gov or phone at (703) 603-7165 if you have questions regarding this guidance.

Attachments (2)

cc (w/o attachments): Wayne Geyer, Steel Tank Institute
David Wiley, OUST
OUST Management Team
Kathy Nam, OGC

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 8, 1999

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Guidance Regarding a New Recommended Practice for Inspecting Internally-Lined Tanks

FROM: Sammy K. Ng, Acting Director /s/
Office of Underground Storage Tanks

TO: State UST Program Managers
EPA Regional Program Managers

A new recommended practice has been developed by Ken Wilcox Associates (KWA), Inc. titled ***Recommended Practice for Inspecting Buried Lined Steel Tanks Using a Video Camera*** (see attachment 1). Until this standard was developed, the Environmental Protection Agency's (EPA) Office of Underground Storage Tanks (OUST) was aware of only one standard, National Leak Prevention Association (NLPA) Standard 631, Chapter B, that described a procedure for the periodic inspection requirements for internally-lined underground storage tanks (USTs).

The Federal regulations at 40 CFR ∮ 280.21(b) require the following when a periodic inspection of an internally-lined tank is conducted:

1. The inspection of the lined tank must be conducted in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory.

2. The lined tank is internally inspected and found to be structurally sound with the lining still performing in accordance with original design specifications.

How does the KWA recommended practice meet each of these requirements? First, the newly developed recommended practice is a standard developed by KWA, Inc., an independent testing laboratory. Second, the KWA recommended practice performs an internal inspection by use of a video camera. Third, the recommended practice determines whether or not the lined tank is structurally sound by using tank and site-specific data and a mathematical prediction model to statistically determine the expected leak-free life of the tank. Finally, the recommended practice determines whether or not the lining is still performing in accordance with original design specifications by conducting a tightness test and performing hardness and thickness testing in areas below the fill riser. A detailed comparison of the lining inspection requirements for each of the standards is provided in attachment 2.

After careful review of the KWA recommended practice, comparison to the NLPA standard and review of the federal regulations, EPA believes that the KWA recommended practice meets the requirements necessary for conducting inspections of internally-lined tanks as required in the federal regulations at 40 CFR § 280.21(b). In addition, EPA recommends that states review the recommended practice to determine if it meets their lining inspection requirements, if applicable under state law. EPA recognizes that states may decide not to allow use of the KWA recommended practice for the periodic inspection of internally-lined tanks under state law.

Please contact Paul Miller of my staff via E-mail at miller.paul@epa.gov or phone at (703) 603-7165 if you have questions regarding this guidance.

Attachments (2)

cc (w/o attachments): Paul Miller, OUST
OUST Management Team
Shushona Clark, Compendium
Kathy Nam, OGC
Ken Wilcox Associates, Inc.

Attachment 2 - Comparison of NLPA 631 and the KWA Standard

Regulatory Requirement	NLPA 631, Chapter B	KWA Recommended Practice
Code of practice is developed by a nationally recognized association or independent testing laboratory	NLPA 631, Chapter B, ***<u>Future Internal Inspection Requirement for Lined Tanks</u>***, copyright 1991, developed by the National Leak Prevention Association, date standard last revised, unknown (OUST received a version in early calendar year 1999 that was changed from the previous version, however, it had no revision number or date). - In the original EPA regulations, NLPA is a nationally recognized association.	***<u>Recommended Practice for Inspecting Buried Lined Steel Tanks Using a Video Camera</u>***, Dated September 28, 1999, First Edition, prepared by Ken Wilcox Associates, Inc. - Ken Wilcox Associates, Inc. is an independent testing laboratory
The tank is internally inspected	***visual inspection*** - for evidence of peeling, blistering, surface wrinkling or roughening of the lining material. Imperfections in the lining shall be repaired in accordance with the lining material manufacturers specifications.	***permanently recorded internal inspection with video camera*** - at least 98% of tank surface must be inspected to pass. - camera must be able to detect presence of problems at least as small as 3/32 inch at the maximum operating distance from the camera. - identify any evidence of separation, delamination, blistering, holidays, peeling, thin areas, surface wrinkling or roughing, cracking, pin holes, or other visible condition that indicates a problem. - any evidence of a perforation or any of the problems listed above, confirmed by the specialist fails the lining.

Regulatory Requirement	NLPA 631, Chapter B	KWA Recommended Practice
The lined tank is structurally sound	***Ultrasonic thickness testing of the tank shell*** - Grid the tank into 3 ft. X 3 ft. sections and perform one ultrasonic thickness test at the center of each section. If a reading is obtained that is 75% or less of the original wall thickness, divide the 3 ft X 3 ft section into 9 subsections and take ultrasonic thickness readings of each of the 9 subsections. Average these 9 readings and record that value as the thickness reading for that section. Repairs can be made to the area if the average is less than 75% of original wall thickness. - Determine the average wall thickness of the tank. - If average wall thickness is less than 75%, then the tank fails. - If average wall thickness is 75% - 85%, cathodic protection must be added within 1 year of the inspection date. - If average wall thickness is >85%, then tank passes this part of inspection.	***A mathematical prediction model is used to statistically determine the expected leak free life of the tank*** - must yield years of leak-free life remaining and the probability of a potential leak of the tank in the specific soil condition found at the site. It shall be based on tank inspection data collected and shall include, at minimum, stray currents, soil resistivity, structure-to-soil potential, soil pH, electrical continuity/isolation, along with any other tests the specialist deems necessary. The mathematical formulation used in the prediction model must be based on accepted physical and electrochemical characteristics of the tank corrosion process. - The tank is considered structurally sound if all of the following are met: 1) the tank is not leaking. 2) results of the prediction model indicate that the age of the tank is less than the expected leak-free life. 3) the probability of a corrosion perforation is less than 0.05.

Regulatory Requirement	NLPA 631, Chapter B	KWA Recommended Practice
The lining is performing according to original design specifications	***hardness testing*** - is required, but standard does not specify test location or number of tests required. - hardness must meet manufacturers specifications for product storage (The manufacturer's specifications are not stated in the standard. However, note that section A4.7.1 of NLPA 631 does state that for linings that have been successfully in service for 5 years in underground tanks, the manufacturer of the lining may document the compatibility of the lining to the product to which the lining has been exposed. Part of the inspection for compatibility is that the lining retains a minimum of 50% original cured hardness to meet compatibility requirements). ***thickness testing*** - is required, but standard does not specify test location or number of tests required. - lining thickness must be a nominal thickness of 125 mils with a minimum thickness of 100 mils. ***holiday testing*** (also referred to as an internal inspection tightness test in the standard) - conducted at a rate of 100 V/mil of nominal lining, but not less than 12,500 V and not more than 35,000 V. - any holidays detected must be repaired. - there can be no holidays detected in the lining on the final test.	***hardness testing*** - minimum of 5 readings below fill riser - 1 reading directly below opening, 4 readings at least 10 inches offset from the centerline, outside any influence of the striker plate. - minimum 50% original cured hardness needed to pass. ***thickness testing*** - minimum of 5 readings below fill riser - 1 reading directly below opening, 4 readings at least 10 inches offset from the centerline, outside any influence of the striker plate. - minimum 100 mil thickness needed to pass. ***tightness testing*** - 0.1 gph tank tightness testing. -failure of the tightness test requires human entry.

Regulatory Requirement	NLPA 631, Chapter B	KWA Recommended Practice

Other requirements relating to the inspection of internally-lined tanks specified in the standard	- confined space entry certification and safety training of employees certification required.
	- inspection affidavit required.
		- specialist must certify to tank owner/operator that personnel performing assessment work on the tank are knowledgeable of all applicable procedures in this practice and that all work was performed in strict accordance with this practice.
		- a preliminary site survey must be conducted
		- visual record and report must be submitted to the UST owner/operator.
		- independent third party evaluation required.
		    - evaluation of video equipment.
		    - comparison to manned entry inspection.
		    - 50 consecutive tank inspections required where video and manned entry inspections are used.

Release Detection References

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

December 19, 1988

Jack Horner
Horner Creative Products, Inc.
413 State Park Drive
Bay City, Michigan 48708-1338

Dear Mr. Horner:

This is in response to your letter to Ron Brand requesting a clarification of SPA's Final regulation for underground storage tanks as they apply to the "threshold value" for declaring a tank, system to be leaking using a precision tightness test. I understand there is some confusion on this issue. My response below is intended to clarify this matter.

To provide more clarity on this question. some background information is necessary," The Agency's tank testing results from the Edison, New Jersey Laboratory show that tank test results are affected by a large number of variables including temperature, tank deformation, vapor pockets, and other factors. Thus, even with a good method, several consecutive tests rarely yield identical results because of the interference or these variables, For example, if a large number of tests were conducted on non-leaking tanks, most of the test results would be close to zero but a few might be a good deal larger or smaller than zero. Therefore, if a tank leaking at exactly 0.1 gph was tested many times, the results would tend to be normally distributed around 0.1 gph. Some Of the measurements for a non-leaking tank may exceed those (or a leaking tank). The attached diagram illustrates this statistical reality.

When a tester goes in the field and conducts a test. as a service to the customer he must be able to make an informed decision about whether or not the tank is leaking. Usually this is done by comparing the test result to a threshold value, traditionally 0.05 gph. To be able to detect a 0.1 gph leak as required in the regulation (at a statistically reliable level of confidence) the threshold must be smaller than 0.1 gph. The correct threshold to meet the regulation depends on the test method. but if the results are distributed evenly (as shown in the illustration attached), the correct threshold is 0.05

gph Thus, the only difference between the regulation and the existing industry practice (NFPA 329) is that the regulation more clearly establishes that at this threshold only leaks of 0.1 gph and greater will be reliably detected As is noted in the preamble to the regulations (53 FR 37145), a threshold value of 0.05 gph should be used unless the manufacturer has determined a different threshold value for his particular method.

I hope this has provided the clarification you need. It you have further questions please contact Tom Young directly at 2O2-475-7261.

Sincerely,

Jim McCormick, Director
Policy & Standards Division
Office of Underground Storage Tanks

cc: Gerald Phillips, Region 5 Program Manager

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

June 22, 1989

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Ms. Judith Spray
Pollulert Systems
Emhart Electrical/Electronic Group
P.O. Box 706
Indianapolis, IN 46206-0706

Dear Ms. Spray:

This is in response to your letter requesting a clarification of the Federal regulations relating to leak detection for pressurized piping at underground storage tanks. You asked if annual line testing is required if system has a permanent line monitoring device.

There are two basic ways for an owner of a tank with pressurized lines to meet the requirements of 280.41(b)(1)(ii):

1. Have an annual line tightness test that meets the standards of 280.44(b) and combine them with an automatic line leak detector capable of shutting-off or restricting flow if a leak is detected of 3 gallons per hour at 10 pounds per square inch line pressure within one hour. However, if an automatic line monitoring device meets the performance standard for a line tightness test, that it "can detect a 0.1 gallon per hour leak rate at one and one-half times operating pressure," then it can be used to substitute for the annual line tightness test.

2. Vapor, groundwater, or interstitial monitoring may be also performed monthly in accordance with the standards in 280.43(e), (f), and (g) as a substitute for the annual line test.

Therefore, the answer to your question is that permanently installed pressure, vapor, groundwater or interstitial monitors may be used in place of annual line tightness tests as long as these methods meet the applicable performance standards. In all cases, automatic line leak detection capability must be provided with pressurized lines.

I hope this has answered your question regarding the regulation. If I may be of further assistance please the contact me.

Sincerely,

/s/

Thomas Young
Standards Branch
Office of Underground Storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

February 28, 1990

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. Michael Bouton
Tracer Research Corporation
3855 N. Business Center Drive
Tucson, AZ 85705

Dear Mr. Bouton:

This is in response to your request for clarification of the federal regulations relating to leak detection for pressurized piping at underground storage tanks. You asked about how to convert a leak rate at one operating pressure to an equivalent leak rate at another operating. pressure.

As stated in the preamble to the final regulations (53 FR 37167) "A manufacturer can test a device at any convenient operating pressure and mathematically convert the results to 10 psi to determine if the device meets the performance standard." This statement also applies to the requirement to detect a 0.1 gallon per hour leak at 1.5 times operating pressure (280.44(b)). EPA believes that the appropriate formula for the conversion is that the leak rate is proportional to the square root of the pressure drop ratio. Thus, a device that operates at operating pressure must be capable of detecting a leak rate of 0.08 gallons per hour to meet the performance standard of 280.44(b).

I hope this has answered your question regarding the regulations. If I may be of further assistance please contact me.

Sincerely,

/s/

Thomas Young
Standards Branch
Office of Underground Storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

July 19, 1990

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. Bill Birdwell
Executive Vice President
Tanknology Corporation International
5225 Hollister Street
Houston, Texas 77040-6294

Dear Mr. Birdwell:

This responds to your June 29 letter requesting clarification about EPA's underground storage tank (UST)requirements for release detection of pressurized lines from the tank to the dispenser. Your specific question was whether such pressurized lines at UST sites that have monitoring wells around the tank pits, but not along the piping runs, must also have an annual line pressure test.

As you probably know, under the EPA UST requirements (and Florida's, I believe) all existing pressurized lines must have emergency shut-off, flow-restrictor, or continuous alarm systems by December 22, 1990. That must be backed up by a monthly monitoring method or an annual line test. The location and number of monitoring wells must be sufficient to detect releases from any portion of the tank system that routinely contains product (Section 280.43 (F)(7)). Thus, if a tank excavation is intercepted by observation wells, but a pressurized line system extends beyond the designed reach of those monitoring wells, then an annual line test (or same other acceptable method of monthly detection) is in order. The intent of our release detection requirements is to identity a release quickly before it becomes a significant corrective action.

I cannot reliably speak to Florida's requirements. However, a site with fractures and fissures or surrounded by silts and clays would not appear to meet our requirement for using groundwater monitoring only in course to medium sands, gravel, course silts, or other similarly permeable materials (Section 28O.43(f)(2)). The point of the site requirement is to assure that a release makes its way unimpeeded to the monitoring well.

I hope this information is helpful to you. I suggest you contact Marshall Mott-Smith with any questions about the Florida UST requirements at (904) 461-3935.

Sincerely,

/s/

David O'Brien, Chief
Standards Branch
Office of Underground storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

May 10, 1991

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Ms. Deborah Talanian
Manager, Marketing and Customer Service
Entropy Limited
South Great Road
Lincoln, MA 01773

Dear Ms. Talanian:

This responds to your request of April 16, 1991 for confirmation that a statistical inventory reconciliation method (SIR) can be used to comply with the Environmental Protection Agency's requirements for release detection on underground storage tanks (UST), including associated piping.

It is my understanding that SIR methods (like Entropy's) compare tank volume inputs to outputs and evaluate several months of data to determine if there exists any statistically-significant discrepancies (including leaks). Because this analysis must include the use of the metered product dispensing records, it is generally a "tank systems" test that should also detect leaks from the piping system. Thus, if properly performed for any particular site, an SIR method that demonstrates a general performance under the EPA protocols to the standards in the rules may be an acceptable alternative to periodic line tightness testing. I must offer two caveats, however.

First, I have some doubt SIR methods can be shown to be a substitute for monthly monitoring because the detection results must be updated and available on a month to month basis should an inspector come by and visit the site. Of course it may be an acceptable equivalent to the daily inventory/periodic tightness test method allowed in the rules, as long as the owner and operator maintains on-site the last year's worth of daily inventory records reconciled for the latest month.

Second, UST systems with pressurized lines must still have catastrophic line leak detectors able to detect a 3 gpa leak at 10 psi. Inventory control is not an effective substitute for such emergency shut-off, restricting, or alarming equipment.

I hope the above information is complete and helpful to you. Thank you for your patience in awaiting my response.

Sincerely,

/s/

Dave O'Brien, chief
Technical Standards Branch
Office of Underground Storage Tanks

(os-410(WF):d.obrien:bmt:308-8554:5/10/9l:DISC#c:drive:stat)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

July 25, 1991

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: What Constitutes the Portion of the Underground Tank that "Routinely Contains Product"

FROM: Dave O'Brien, Chief /s/
Technical Standards Branch
Office of Underground Storage Tanks

TO: Leslie Zawacki, Acting Program Manager
Region VIII UST Program

It has recently Come to my attention that a regulatory interpretation memo (copy attached) was provided to you by this Office on June 26, 1991 concerning the issue of whether an in-tank monitor may be used as a "precision-test" and would suffice for the purpose of complying with requirements for the initial tightness test mandated at all new UST installations. The conclusion reached about that issue in the earlier memo is correct for use as guidance at the time of installation: an in-tank monitor, when set in the test mode meets the new tank installation requirement for performing a precision test if it achieves the 0.05 gals/hour NFPA standard and tests all portions of the UST system up to the level of the tank's interior that is immediately below where the overfill prevention equipment would be triggered. Unfortunately, some of the rationale provided in support of this interpretation was incorrect and inadvertently raised another issue that is at the heart of the release detection regulation. The following additional discussion is therefore provided primarily to clarify this other issue: for purposes Of EPA leak detection requirements what constitutes the portion of the tank that routinely contains product?

The phrase "routinely contains product" is used in the regulations to describe that portion of the tank system that at a minimum must be covered by the release detection method used. This language was added to the final rule primarily to implement EPA's stated intent to allow the use of numerous methods of detection to meet our leak detection requirements, such as Partially-fil1ed in-tank level sensors, statistical inventory reconciliation (SIR) services, and non-volumetric methods (e.g., in-tank acoustic testing or tracer techniques). Our findings from EPA's causes of releases studies done in support of the final regulation revealed that even old bare steel tanks (the worst case scenario) only rarely, if ever, leak in the top third of the tank (except at the bungs and fittings on the tank top which are the target of the overfill prevention requirements). Therefore, EPA has determined it is protective of human health and the environment to be somewhat flexible about what portion of the upper part of the tank must be tested so that UST owners and operators can take full advantage of the different types of release detection available in the marketplace.

The "routinely contains product" language fosters the use of several different methods of release detection in basically two ways. First, it makes clear that detection methods can be used that do not test the vent pipes, fill pipes, and fittings on top of the tank–EPA has mandated that these areas in the future do not "routinely" contain product through compliance with the overfill prevention requirements. As a general engineering approach EPA decided it was preferable to prevent product from getting to those upper portions of the tank system rather than trying to prevent leaks at the tank's top by making sure that the fittings continue to remain tight over the tank's operating life. Second, the language also provides some flexibility as to what portion of the tank vessel below the fittings must be checked by the leak detection method used. Because different detection methods operate on different principles and have different capabilities, we did not want to unnecessarily restrict release detection to only those methods that always test the complete tank shell's integrity. We certainly did not intend to restrict tightness testing to only those methods that test the integrity of the shell up to the level of the overfill prevention triggering device (as was incorrectly stated in the June 26 memo).

The following are some simple "rules of thumb" to use in determining whether the portion of the tank that "routinely contains product" has been adequately tested by the release detection method used:

(1) With some non-volumetric test methods, the level of the product in the tank does not impact the release detection method's performance capabilities. Thus, for purposes of EPA's regulation, the level of liquid in the tank vessel at the time of the test is not of concern, (for example, acoustical methods and statistical inventory reconciliation services (SIR)).

(2) For automative tank gauging equipment, the liquid level in

the tank at the time of the test must be appropriate for the method to be able to detect the required minimum leak rate with a probability of detection of 0.95 and a probability of false alarm of 0.05. Particularly in larger tanks, the further down the liquid level is at the time of the ATG's test the more difficult it is to achieve the required performance standard. (Any in-tank level monitoring method installed after 12/22/90 must be backed up by an evaluation of that method's performance following EPA's evaluation protocol and the results of the evaluations should specify any limitations of the use of the method including the level at which the required leak rate performance was achieved on the test tank.

(3) The major in-tank level monitoring service providers most often specify in the methods' stated protocols that their practice is to test almost the complete integrity of the tank, including up very near to the top of the tank (85% to 95% full). This is considered by EPA as meeting the "routinely contains product" provision in the regulations.

(4) At the time of final rulemaking EPA was also aware of numerous small businesses (with low levels of product sales) who were reported to purposefully maintain low product inventory levels as part of their normal business routine. Therefore, EPA concluded that it is unduly restrictive to limit test methods to only those approaches that test nearly the complete tank's integrity (and would require a small business owner to order an unusually high volume of product to assure testing of the upper portions of the tank that would otherwise rarely ever be called upon to store product). In these types of situations, when an on-site inspection is conducted, the inspector might include a quick check of the required inventory records to determine if in fact the tank is routinely being filled (i.e., not just on a rare occasion) significantly above the liquid level at which the tank test was conducted.

cc: OUST Management Team
Desk Office Team

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

June 26, 1991

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Automatic in-Tank Monitors

FROM: Dave O'Brien, Chief /s/
Technical Standards Branch
Office of Underground Storage Tanks

To: Leslie Zawacki, Acting
Region 8 UST Program Manager

I am providing the following interpretation in response to Region 8's question as to whether an in-tank monitor in the test mode may be considered a precision test and, if yes, would this test suffice for the requirement of performing a precision test at new tank installation?

Our regulations, at 280.20(d), require that "all tanks and piping must be properly installed in accordance with a code of practice developed by a nationally recognized association..." The regulations go on to list API Publication 1615 as an acceptable code of practice. API Recommended Practice 1615 (section 10.6 Final Testing), states "Conduct precision test (see 1.3.23) of all tanks and piping after all paving over the tanks and piping has been completed and before the system is placed in operation." Section 1.3.23 defines a precision test as "a test of the liquid-product-handling portion of an underground storage tank system, or a portion of the system that meets the criteria of NFPA 329." NFPA 329 states that the test should be capable of detecting a loss of .05 gallons/hour.

The regulations also require that t tightness test, which is analogous to the precision test in NFPA 329, incorporate all portions of the UST system that routinely contain product. Thus the automatic in-tank monitor must test all portions of the UST system that are not protected by the overfill protection device, i.e., the UST must be filled with liquid to the level immediately below which the overfill device would be triggered.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

April 6, 1990

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Ms. Priscilla Young
American Petroleum Institute
1220 L Street, NW
Washington, DC

Dear Ms. Young:

Thank you for your letter of January 12, 1990, regarding the use of manual tank gauging as the sole leak detection method for tank of 1000 nominal capacity. We have carefully reviewed the calculations you submitted and have concluded that, when conducted in accordance with the procedures described in the attachment, manual tank gauging meets the performance standards in 40 CFR 280.43(h)(1) for tanks of nominal capacity of 1000 gallons or less. Thus, for tanks of this size manual tank gauging can be used as the sole means of meeting the leak detection requirements.

If you have any questions regarding this response please give me a call.

Sincerely,

/s/

Ronald Brand, Director
Office of Underground Storage Tanks

Attachment

Requirements for manual tank gauging for 1000 gallon tanks

In order to meet the performance standard for “other methods” in 40 CFR 280.43(h)(1), manual tank gauging must meet the following requirements:

1. Tank liquid level measurements are taken at the beginning tha ending of a time period during which no liquid is added to or removed from the tank. The appropriate time period is listed in the chart below;

2. Level measurements are based on an average of two consecutive stick readings at both the beginning and the ending of the period.

3. The equipment used is capable of measuring the level of product over the full range of the tank’s height to the nearest one-eighth of an inch;

4. Testing must be conducted at least once a week and four weekly results must be averaged to obtain a monthly result. A leak is suspected and subject to the requirements of Subpart E if them variation between beginning and ending measurements exceeds the weekly or monthly standards in the following table:

Nominal tank capacity and dimensions	Weekly standard (one test)	Monthly standard (average of four tests)	Minimum test duration
1000 gallons (64" x 73")	9 gallons	4 gallons	44 hours
1000 gallons (48" x 128")	12 gallons	6 gallons	58 hours

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MARCH 5, 1992

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Clarification of “Catastrophic” Leak Detection Requirements for UST systems with pressurized Delivery Lines

FROM: David W. Ziegele, Director
Office of Underground Storage Tanks

TO: Regional Program Managers
Regional Branch chiefs

It has been brought to my attention recently that some confusion exists within the pipeline leak detection community regarding whether or not EPA requires quantitative annual performance tests of mechanical and electronic line leak detector. (“LLDs”) on all pressurized piping at UST sites. Section 280.44(a) of the UST technical rules requires owners and operators to test the operation of all USTs annually in accordance with manufacturer requirements. The same section of the rules also cites the need for such devices to detect leaks of 3 gallons per hour (gph) at 10 pounds per square inch (psi) within 1 hour. The purpose of this memorandum is to clarify what kind of annual test must be performed on LLDs under the rules.

The question of what constitutes an annual equipment test is an important one, because we estimate there are somewhere between 500,000 to 750,000 pressurized lines at UST sites nation-wide. This issue was initially addressed in an August 12 memo prepared by Randy Nelson, Region VII, with the cooperation of David Wiley from OUST, that was distributed to all the Regions (see Attachment I). However, they both attended a November 18-19 ASTM meeting in Kansas City on pressurized line testing where it was obvious that while all in attendance had seen Randy’s memo, some members of the leak detection provider industry still persisted in their contention that EPA requires (or at least should require) a once-a-year quantitative performance test of all LLDs in the field.

Provided with this memorandum im a brief technical analysis of the rule's leak detection requirements for pressurized lines (Attachment II). I believe you will agree that it reflects our original intentions during promulgation of the technical requirements for line leak detectors. It also supports with Randy Nelson's earlier interpretive findings in this area, that:

(a) Any model of LLD installed after September 22, 1991 must have been evaluated according to EPA's standard test procedure. The evaluation, usually performed by a third party, must find that a typical out-of-the-box LLD is able to detect, at a minimum, a leak at 3 gph at 10 psi within 1 hour, with a probability of detection of 95% ant a probability of false alarm of 5%.

(b) The annual test of the LLD is an operational, as opposed to quantitative, verification that the LLD is functioning in the piping system. The annual test is not intended to show compliance with the above evaluation performance standard. There are no quantitative or performance test requirements for an installed model of LLD that passed the evaluation. The annual test should be performed to assure that the LLD is installed in the line properly, not being tampered with, being maintained, and operating within the manufacturer's specifications.

We found some good news in the compilation of some recent pressurized line tightness testing data which suggests that when the regulatory approach we promulgated (and further explain in this paper) is complied with, it appears to be having the desired positive effect in protecting human health and the environment: properly managed pressure lines are leaking less than 0.5 percent of the time, usually at substantially less than 1.0 gals/hour. This is a vast improvement over the 10 percent leakage frequency and the too frequent catastrophic leak rates reported prior to final rule promulgation.

Unfortunately, even in the face of such good news, some service providers in the leak detection community continue to argue the need for annual, in-the-field quantitative performance tests of all LLDs. At this time, I do not see any need for such tests.

In response to the present confusion, I intend to share the findings shown on the attachments with the wider leak detection community. Towards that end, I am mailing a copy of the attached analysis and rule interpretation to each of the three providers of mechanical line leak detectors. Also, I am providing this information to Bob Renkes, Executive Director of the Petroleum Equipment Institute, for summary in PEI's TulsaLetter. We have prepared an Environmental Fact Sheet (Attachment III) summarizing the issue and we are sending copies according to our standard distribution.. If you have requested that materials go through you, please pass on the enclosed copies of the fact sheet to your state contacts

If you have any questions about this letter please Contact David Wiley at (703) 308-8877 or Randy Nelson Region VII at (913) 551-7220.

Attachments

cc: Roy Bennett, President
Vaporless Manufacturing Inc.

Robert L. Besson, President
The Marley Pump Company

Gene Mittermaier, Manager, New Product Development

Tokheim Corporation

Bob Renkes Petroleum Equipment Institute

bcc: John Van Daele
Tokheim Corporation

AUGUST 12, 1991

MEMORANDUM

SUBJECT: A Technical Update on “Catastrophic” Line teak Detectors and the UST Regulations

FROM: Randy Nelson, Senior Environmental Engineer,
State Programs Sections, EPA Region VII

TO: Distribution List

It has recently been brought to our attention that there is presently a great deal of contusion about how EPA's release detection regulations for underground storage tanks (USTs) apply to the “catastrophic” line leak detector (LLD) that must now be in place on all pressurized lines attached to USTs. Widespread confusion about how to interpret EPA’s requirements as they apply to LLD’s has been reported among manufacturers, owners, testers, and the state regulators. This brief memo is intended to clarify and update you on the Office of Underground Storage tank’s (OUST) regulatory interpretations and recent activities on this subject. This information has been developed in cooperation with OUST.

Statement of Problem

A major source of the confusion about LLD’s and their associated EPA requirements appears to stem from the fact that several line tightness testers are now reportedly offering and providing services in the field that not only test the tightness of pressurized lines (at the 0.1 gals/hour minimum leak rate on an annual basis as required by the regulations) but also to test the leak threshold performance capabilities of the catastrophic LLDs at the site. There appears to be a wide-spread but incorrect belief that EPA regulations require such field performance testing of the LLDs at the time of the required annual tightness test of the lines. The UST regulations require that the performance of the LLDs be checked annually in accordance with the manufacturer’s requirements.

Summary of EPA's Requirements for LLDs

Very simply, EPA’s regulations in 40 CFR Part 280 Subpart D require that LLDs must be:

(a) installed on all pressurized piping that connects to an underground storage tank (see 280.41(b)(1));

(b) operational and functional and capable of detecting a catastrophic leak, including an annual test in accordance with the manufacturer’s requirements (see 250.44(a); and

(c) certified by a third party testing organization to be able to perform “out of the box” to EPA’s standards of 3 gph at l0 psi, with a probability of detection of 0.95 and probability of false alarm of 0.05 if the LLD is installed after September 22, 1991 (see 280.40(a)(3); 55 Federal Register 26, published January 2, 1991; and EPA's recommended line leak detection evaluation protocol).

Discussing each of the above points in turn:

Federal Regulations require line leak detection on all pressurized piping from underground storage tanks. The most popular type of LLD is designed to test the piping for a large leak every time a submersible pump is turned on and off. If the line is leaking, the LLD will restrict flow from the pump and/or sound an alarm alerting the attendant there is a problem with the piping.

The LLD must be in place and in working order and its intended function must not be altered In any way. The functional element of the LLD must be active and have the ability to sound an alarm or restrict the flow of product in the pipe if a leak is detected.

An LLD installed after September 23, 1991 must have had its leak detection ability evaluated and certified by a third party according to an accepted protocol for LLDs. Manufacturers of LLDs are responsible for obtaining the certification and the quality control of subsequently manufactured LLDs. A new LLD (out-of-the-box) must be capable of detecting a 3 gallon per hour leak at 10 psi with a 95% probability of detection and a probability of false alarm of 5%. Once a LLD is installed in the field there is no EPA rule requiring a test to determine if the LLD can detect a 3 gallon per hour leak, but the LLD must be checked on an annual basis in accordance with the manufacturer's instructions.

The Unsettled Issue of LLD Field Performance

The EPA is presently gathering and reviewing pressurized line testing data to examine if perhaps routine field testing of the LLDs detection threshold may be necessary to protect human health and the environment and, if so, what is the minimum level of detection that a field-installed LLD must be capable of demonstrating in a field performance test. Unlike some of the other regulated portions of an UST system, LLDs have moving parts that are subject to wear that may cause degradation of the LLD's performance over time. It is simply not clear to EPA at this time what level of degradation in the field will cause LLDs to not catch the "catastrophic" types of Leaks that occurred in the past at UST sites (and that we are trying to regulate). Therefore, OUST is conducting a quick field study of this question that includes the collection of line leak performance data and interviews of experience field personnel.

Based on the results from this on-going study, OUST will provide further guidance in the future about the level of detection an installed LLD must be capable of detecting in the field. Some possible options include proposing EPA regulatory changes; turning to consensus code making bodies (such as ASTM or PEI) for standard-setting assistance; or simply continuing with the current requirement of annually checking LLD field performance "according to the manufacturer's requirement". The latter approach (no action), for example, would be protective of human health and the environment if the study results show that catastrophic line leaks are typically manifested in a way that will be quickly detected, even by equipment that has degraded through use overtime.

Caution About Evaluation of LLD Field Performance

The equipment currently being used to test and evaluate the performance of LLDs in field has generally not been scrutinized by EPA or a consensus code making body. Therefore, the results of voluntary tests of this nature should be viewed with caution. Many of these field-test-devices have been designed and utilized on an ad-hoc basis to evaluate LLD performance but have not been shown to reliably accomplish this task according to some independent or established consensus guideline (most likely because-no guideline exists that we know of). EPA will be discussing the need for such guidelines with appropriate code making bodies after the above-mentioned EPA study is completed.

If you have any questions about the above technical information please contact me at, Region VII, FTS 276-7220, Dave Wiley, OUST, at FTS 398-8877, or Joe Womack, Region VI, at FTS 255-6755. These are the EPA employees on the line leak detection team working on this issue

cc: EPA Regional UST Program Managers

ATTACHMENT II

<u>Automatic Line Leak Detectors Paper</u>

1. What are (Catastrophic) Line Leak Detectors (LLDs)?

2. Background/Purpose of the LLD Requirement

3. The LLD Performance Standard (3gph/10psi @95 &05)

4. Annual Test of the LLD's Operation

5. Summary/Conclusions: “So What is Required by EPA?”

Appendix I - Data and Analysis

Appendix II - ASTM Efforts

1 What are (catastrophic) Line Leak Detectors (LLDs)?

The following description was provided by the American Petroleum Institute in their July 15, 1987 comments on the proposed rule. It is repeated here because it is a good summary of the flow-restrictor type of LLDs:

"Mechanical Line Leak Detectors (MLLDs), which work in the following manner. When the dispenser is activated product flows through the detector at a rate of 1.5 to 3.0 gallons per minute. This causes the pressure in the pipe to increase rapidly to 8 to 10 psi. This increase in pressure actually pushes the valve in the leak detector toward a shut position, restricting the flow to a rate of 3 gallons per hour. If there is a leak in the system of 3 gph or greater at 10 psi, then the pressure will not increase further and the flow will remain restricted. If there is a leak of lesser magnitude, then the pressure will build slowly, though it will eventually reach full operating pressure. If the system is tight, then the pressure will increase rapidly. As the pressure goes above 10 psi, the valve is forced to its fully open position, and the system is in operation. The valve remains open until the pressure in the line drops below 1 psi."

Since the time the rule was formulated, electronic LLDs have emerged in the market. Though electronic LLDs are not subject to the same types of wear and tear as mechanical devices, the following discussions cover all LLDs.

(b) Background/Purpose of the LLD Requirement

As stated in the preamble to the final rule (53 fed. Reg. 37153 (1988)), LLDs were required by EPA in the belief that their use which eliminate 80 to 95 percent of the volume of releases occurring from underground piping at UST sites. As stated in the EPA Causes of Release report done in support of the final rule, the consensus from the field experts was that releases from pressurized lines without LLDs can result in large, "overnight" catastrophic releases that typically range in size between 600 and 6,000 gallons. Also cited in the report was a meeting with nine experienced installers who could together easily recall over one hundred and fifty such incidents. While the field experts were not sure exactly how LLDs functioned, they did observe that they successfully detected catastrophic leaks, particularly if the device was kept in operating condition and was checked periodically so that its use was not tampered with or overridden by the UST owner or operator. These claims were corroborated by numerous other commenters. EPA's faster phase-in of the use of LLDs in the final UST rule was intended to curtail these catastrophic, or run-away, releases from pressurized lines.

The use of LLDs was also anticipated by some commenters as having the added benefit of detecting and enabling curtailment of releases even much smaller than 3 gph. One commenter (UST2-1-CO-413A) provided calculations showing how even relatively small leaks (significantly less than 3gph) will noticeably extend the LLDs cycle time in its test (flow restriction) mode well beyond the normal cycle of 2 seconds, particularly when beginning to first operate the pressure line system each day. These delays are noticed by customers who alert the UST owner that there may be a problem in the line. One very experienced contractor (UST2-3-SB-45) estimated that LLDs would cause detection of over 80% of the leaks in pressurized lines in this manner. Many of these commenters agreed with the Agency's final rule decision to back up LLDs with a more rigorous once-a-year line tightness test to catch the rest of the smallest leaks.

In sum, the general consensus was that LLDs are crude but effective devices for curtailing catastrophic releases from pressurized lines, provided they are periodically checked and assured to be in operating condition. There were some questions about how these devices worked, but very little doubt expressed about their ability to detect catastrophic leaks early, provided they are maintained in good working order.

(c) The LLD performance Standard
(3gph/10psi @95/05)

As discussed in the final rule's preamble and the summary and response document, several commenters stated that line leak detectors that restrict flow of product were unable to meet the proposed 2 gph criterion. Based on an evaluation conducted by EPA'S office of Research and Development and a commenter-supplied evaluation of several LLDs, the Agency established the standard as 3 gph at 10 psi, with a probability of detection of 0.95 and a probability of false alarm of 0.05. At the tine of final rule, method providers did not have a means to obtain this type of performance information for each method. Thus, the 95/05 portion of the standard was delayed for two years. In effect, method providers were given 2 years to develop method-specific performance data and, if necessary, modify their methods so that they could meet the EPA standard.

EPA completed and distributed a final method performance evaluation protocol, titled Standard Test procedures for Evaluating Leak Detection Methods: Pipeline Leak Detection Systems, in October 1990. The compliance date on the 95/05 portion of the standard was pushed back by EPA 270 days (or until September 22, 1991) to enable method providers to evaluate and distribute method-related performance data using the standard results-reporting sheets in the recommended protocol (56 Fed. Reg. 24 (1991)). As stated on page 2 of the protocol, the performance estimates that result from conducting the protocol on a particular method enable them to be easily compared to the technical standards prescribed in the EPA final regulation. Similar to the other protocols, the recommended evaluation for piping detection methods “is not designed to determine the functionality of the system (i.e., whether it operates as intended), nor is it meant to assess either the operational aspects of the system (e.g., the adequacy of the maintenance and calibration procedures) or the robustness of the system." In other words, for each method it is a one-time, out-of-the-box test on a representative piece of equipment. It does not have to be repeated on each new piece of equipment built at the factory to the same specifications.

4. Annual Test of the LLDs Operation

Section 280.44(a), in addition to stating the 3 gph/10 psi performance standard, also requires "an annual test of the operation of the leak detector...conducted in accordance with the manufacturer's requirements." The final rule's preamble points out (on page 37167) that this requirement was added in response to commenters' concern that line leak detectors can "malfunction or be overridden by unwise operators." The Agency's supporting summary and response to comments document (page 12-5) further identifies these commenters' concerns that there is a need for such maintenance checks because of "the possibility that the equipment could fail or that operators could shut them off." Some of the specific concerns cited by commenters included:

(a) "our experience is that many operators disconnect these devices because of the fear of offending customers should the device trip and restrict flow... (inspection) will insure operational integrity... to see if they are working." (UST2-3-CO-56)

" "An annual check to determine if the LLD is functioning properly..." (UST2-3-CO-62)

" "It is our experience that if LLDs are not maintained annually, then a significant percentage will fail to function as designed." (UST2-1-PHC-3-A)

" "...to ensure that they are in working condition." (UST2-3-LC-26)

" "A simple self test... to determine that the internal circuitry and overall unit remains functional..." (UST2-3-CO-19)

Most of these commenters also expressed reservations about EPA establishing a performance standard for LLDs and certainly did not express the need for an in-the-field quantitative performance check. A check for equipment operability, to determine if it was turned off or otherwise tampered with was clearly what these commenters had in mind. Is it hooked up and in working order? Has it been circumvented by the operator? Is it broken? These are questions meant to be answered by EPA's required annual test of the equipment's operation. The fact that some line tightness testers now claim to have developed various methods for conducting quantitative measurements of equipment performance in the field is an interesting and potentially valuable improvement in technology. However, it is not something required by EPA's annual test of the operation of LLDs.

<u>Summary/Conclusions:</u> "So what is required by EPA?"

As provided in more detail on page 23 of OUST's "straight Talk on Tanks," each pressurized piping run must be equipped with an automatic line teak detector, backed up by an acceptable monthly detection method or an annual line tightness test (conducted at 0.1 gals per hour).

All automatic line leak detectors, including mechanical and electronic, must be able to detect a leak of at least 3 gph at a line pressure of 10 psi within one hour. All LLDs installed after September 22, 1991 must also be able to meet the more stringent EPA requirements for detection performance (a probability or detection of 0.95 and a probability of false alarm 0.05). Demonstration of compliance with the performance standards (and the statistical probabilities of performance) can be accomplished by a one time test conducted on a typical piece of equipment "out-of-the-box" using the recommended EPA evaluation protocols. It is EPA's understanding that all the major manufacturers of line leak detectors are able to provide proof of such performance to all UST owners and operators using the major methods now on the market.

The operation of all automatic line leak detectors must also be checked once a year. This test must assure that the equipment is properly installed in the line, is not tampered with or being bypassed, and is not broken or otherwise outside of the specifications/requirements provided by the method's maker.

Annual quantitative performance tests of each piece of equipment installed in the field are not required by EPA's standards. such tests are voluntary, and once standardized, may become a good industry practice. However, such field test results that indicate more than 3 gph LLD performance on a line in the field do not necessitate automatic equipment replacement under the EPA requirements. Manufacturer requirements should be followed to determine if the equipment is actually broken and operating outside of the equipment's normal range of tolerances and specifications. For example, if a LLD fails to detect a 3 gph leak at 10 psi, but detects a 4 gph leak at 10 psi the owner is in compliance with EPA regulations, provided the owner is in compliance with the manufacturer's requirements.

Recent data collected by EPA from some 3,500 line leak tests (tee appendix I) indicated that LLDs properly applied in accordance with the above EPA requirements appear to ha doing the job they were intended to do: eliminating catastrophic leaks and causing earlier detection or smaller leaks (through noticeable, extended equipment cycling times).

Appendix I - Data and Analysis

Overview: In the fall of 1991, five companies which test pipelines and mechanical line leak detectors (LLDs) provided recent data from approximately 3500 separate tests from around the country. The vast majority of LLDs installed are "Red Jackets," manufactured by Marley Pump.

Conclusions on the sample data:

Pressure pipelines

- Less than 1% of lines were reported leaking.
- Size of leaks: either less than 0.3 gallons per hour at approximately 50 pounds per square inch, or so large as to be "unable to hold pressure".

LLDs

- There is a wide variation in the rates of rejection in the field of in-service (vs. new) mechanical LLDs depending on the equipment and procedures used. Red Jacket Piston Leak Detector reject rates vary from 5% to 54%.
- During annual field performance tests, a large number of Red Jackets fail at 3 gph at 10 psi, but pass at 4 gph at 10 psi (31% in one survey of 605).
- Out of 1 tester's 59 rejected LLDS, only 1 LLD failed to actuate at flowrates greater than 8 gph @ 10 psi. Most failed to trip between 6.0 and 7.0 gph.

Inferences on the population as a whole:

Pressure pipelines

- Line leaks in range of 1.0 gph to 10.0 gph at line pressure (~30 psi) are rare. Either lines "weep" or they leak at much higher flowrate.

LLDs

- LLD performance degrades to values above 3 gph @ 10 psi, but not beyond 8.0 gph. They wear down, but not out.
- Wide variation in failure rates among test methods could be reduced if testers' equipment and procedures adhered to an industry standard.

Appendix II - ASTM efforts

An industry advisory task force has formed to study the subject of catastrophic underground pipeline leak detection, and to recomend an approach for testing line leak detectors (LLDs), This group is under the auspices of ASTM Subcommittee on Storage Tanks (E-50.01), and was formed in response to concerns over the wide variation in the way mechanical LLDs are flow tested in the field. Such field testing is currently not covered by either an EPA protocol or a nationally recognized consensus code. The work product(s) of this task force could serve as the basis for an ASTM approved standard.

The ASTM task group membership includes manufacturers of mechanical and electronic LLDs, experienced end users, testers, consultants, and EPA. The group has agreed to concentrate on basic technical requirements and on the variables (such as viscosity, temperature, piping, bulk modulus, etc.) encountered in the field in testing the performance of LLDs. For example, a method should be able to test a LLD in the line, as well as out of the line. The group will not address either the field test performance standard (which EPA has been asked to clarify) or LLD design and test procedure details (which must be left up to manufacturers).

If an ASTM Standard is approved, it could be used by manufacturers and testers as the minimum technical requirements that their specific testing equipment and procedures must meet when evaluating LLD performance in the field. The potential benefits of an such a Standard are several A practice on this subject will, at a minimum, promote a nationwide consistency of field testing among all methods and thereby provide comparison of equipment performance as well as an empirical basis for further equipment improvement. Since this effort addresses how testing is done, it is separate from EPA's clarification of what regulatory standard testing must meet.

(OS-410WF) :DObrien:drw:678-8877:12/2/91:DISC#MacHD:LLDInApp

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

July 9, 1992

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. John Hendershot
World Enviro Systems, Inc.
P.O. Drawer 789
Shawnee, Oklahoma 74802

Dear Mr. Hendershot,

This is to respond to your attached letter of March 19, 1992, requesting "EPA's acceptance of the World Enviro Systems, Inc. flexible membrane internal containment/vacuum monitor system for single wall steel or fiberglass tanks as secondary containment with interstitial monitoring..." Unfortunately, EPA does not test, certify, or approve specific brands or products. What follows, however, is a clarification on how EPA's underground storage Tank (UST) regulations apply to the type of system described in your letter. It has been reviewed by representatives of EPA's Office of General Counsel, and of State and EPA Regional UST programs.

In summary, flexible internally fitted liner systems can be shown to meet the Federal requirements for release detection (but not for upgrading or repairing) for both petroleum and hazardous substance USTs if certain conditions are met. Please refer to the discussion below.

<u>Background</u>

Based on information you have provided, our understanding of the type of system at issue is as follows. The system includes a flexible non-metallic internally fitted one piece liner. This liner is situated inside a steel, fiberglass-reinforced plastic or composite UST, and covers the entire inner surface of the tank. There is continuity throughout the interstitial space such that both vapors and liquids can migrate from any part of the interstice to another. The system maintains a vacuum in the interstitial space and triggers an alarm when conditions indicate a breach in any portion of either the liner or in the tank outside the liner. Piping is not addressed by the system.

We further understand that there are currently no codes of practice or standards developed. by nationally recognized associations or independent testing laboratories for the design, construction, installation, testing, or maintenance of flexible liners specifically for the storage of petroleum or other regulated substances.

Our clarification is based on the above understandings and may not apply to other types of systems. Also, please note state and local requirements can differ from EPA's.

Release detection for petroleum underground storage tanks

Internally fitted liners are specifically addressed in section 280.43 -"methods of release detection for tanks." Section 280.43(g) allows interstitial monitoring to be used if the system is designed, constructed and installed to detect a leak from any portion of the tank that routinely contains product, and 280.43(g)(3) allows internally fitted liners, provided that "[f] or tanks with an internally fitted liner, an automated device can detect a release between the inner wall of the tank and the liner, and the liner is compatible with the substance stored." Compatibility is also required in Section 280.32, which requires that "owners and operators must use an UST system made of or lined with materials that are compatible with the substance stored in the UST system."

Compatibility testing and documentation can assure owners and operators that a liner is compatible with the material to be stored. There are many test methods available (including EPA's SW-846 Method 9090A) and the data you provided cover many years of testing. EPA does *not*, however, determine whether or not a particular liner is compatible with any substance or blend which could be stored in UST systems.

However, if the liner is compatible with the substance stored and monitored at least every 30 days as required in section 280.41, a system incorporating a flexible membrane could be shown conclusively to meet the release detection requirements for petroleum USTs.

Release detection for hazardous substance USTs

A *hazardous substance* UST system, which is defined in section 280.12, must currently meet, at a minimum, the requirements for a petroleum UST plus additional requirements for hazardous substance UST systems found in section 280.42(b)(2). New systems must meet the additional requirements now; existing systems must meet the additional requirements by December 22, 1998. These additional requirements include secondary containment systems which must be designed, constructed, and installed to:

" contain regulated substances released from the tank system until they are detected and removed;
" prevent the release of regulated substances to the environment at any time during the operational life of the UST system; and
" be checked for evidence of a release at least every 30 days.

The regulations note that the provisions of 40 CFR 265.193 (a portion of the regulations promulgated pursuant to subtitle C of the Resource conservation and Recovery Act that is applicable to tanks storing *hazardous wastes*) may be used to comply with these requirements. We consulted with representatives of EPA's Office of Solid Waste (OSW), who could not state without more extensive review that flexible membrane internal containment systems would meet the requirements of section 265.193. They further recommended that, since most states are authorized to operate their hazardous waste programs; inquiries should be made to the individual states. OSW also recommended the Technical Resource Document for the Storage and Treatment of Hazardous Waste in Tank Systems (EPA/530/SW-86-044, National Technical Information Service PB86-2194l7/AS) as a helpful resource.

Although compliance with the hazardous waste tank regulations is unresolved, resolution of this question is not necessary to determine compliance with the UST regulations. We believe that a system which incorporates a flexible membrane as described above could meet the requirements of integral secondary containment for both petroleum and hazardous substances if the outer tank is in compliance with all other applicable requirements, including new tank standards now in effect and upgrading standards due to take effect in 1998.

Upgrading of existing UST systems and repairs allowed

Section 280.21 requires that, as of December 22, 1998, all tanks must meet new UST system performance standards, upgrading requirements, or closure requirements. The addition of a flexible liner system alone is not sufficient to meet either the requirements of this section for upgrading, or the requirements of section 280.33 for repairs. These sections require adherence to a code of practice developed by a nationally recognized association or independent testing laboratory, and we know of no such standards developed for the type of system described above.

Conclusion

A system with an internally fitted liner and an automated detection device matching the description above may be capable of meeting the Federal requirements for release detection for both petroleum and hazardous substance USTs if the liner is compatible with the substance stored and if an automated device triggers an alarm when any portion of either the outer tank or inner liner is breached. This same system cannot presently meet Federal requirements for upgrading or repairing existing UST systems.

Many leak detection methods are evaluated against standard test procedures to verify performance. Although such an evaluation is not required by EPA's regulations, it may help owners and operators and State and local governments judge how a system will meet particular needs.

The Office of Underground Storage Tanks encourages innovative approaches to UST problems. We also recognize the importance of nationally recognized associations and testing labs, and encourage developers to work with them in evaluating and documenting the performance of new systems. EPA labs are not currently involved in this area.

Thank you for contacting us and providing us with background information. If you have any questions, please contact David Wiley of my staff at (703) 308-8877.

Sincerely,

/s/

David W. Ziegele, Director
Office of Underground Storage Tanks

Attachment

cc: UST/LUST Regional Program Managers
Dawn Messier, OGC
Chester Oszman, OSW
Joe DLugosz, EMSL - Las Vegas
Anthony Tafuri, RREL, Edison
Barbara Simcoe, ASTSWMO
Josh Baylson, OUST
William Lienesch, OUST
David Wiley, OUST

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FAX: (203) 651-2750

October2, 1992

Mr. David Ziegele, Director
Office of Underground Storage Tanks
US Environmental Protection Agency
401 M Street, SW
Washington, D.C. 20460

Dear Mr. Ziegele,

I would like to request clarification in writing on an issue that continues to confuse the UST leak detection industry, as well as many state regulators. In the federal UST regulations under 280.43(d)(2) there is the requirement of inventory control in addition to automatic tank gauging. This requirement is not consistent with that portion of the regulations (280.43) because the last section [(h)] says that "Other methods" may be used that can detect a release of 0.2 gph with a Pd of 0.95 and a Pfa of 0.05. Section (h) does not require other methods to be supplemented by inventory control. Automatic tank gauging clearly can meet the general leak detection requirements and, therefore, should not be mandated to have inventory control as a supplement.

I understand that this issue was clarified a couple of years ago in a letter from Jim McCormick to a Washington, D.C. law firm. We would greatly appreciate a letter that reiterated that clarification. Thank you very much.

Sincerely,

/s/

Philip B. Durgin
Senior Research Scientist

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOVEMBER 22, 1993

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. H. Lawrence Culp, Jr.
Veeder-Root
125 Powder Forest Drive
Post office Box 2003
Simsbury, CT 06070-2003

Dear Mr. Culp:

This letter responds to your request (copy enclosed) for clarification of the Federal underground storage tank (UST) regulations at 40 CFR 280.43 concerning automatic tank gauges (ATGs) and inventory control. A letter (copy enclosed) from this office dated April 18, 1989, to R. Sarah Compton, stated that inventory reconciliation need not be used to supplement the use of an automatic tank gauge capable of detecting a release of 0.2 gallons per hour with a 95% probability of detection and 5% probability of false alarm.

EPA has not changed this interpretation. If an ATG has been shown to meet the monthly performance standard, including the above probabilities, then, pursuant to 40 CFR 280.43(h)[1] inventory control is not required, regardless of the installation date. On the other hand, an ATG that has not been shown to meet the probability requirements must be used in combination with inventory control for compliance purposes. Note that 40 CFR 280.40(a) (3) requires that all ATGs permanently installed on or after December 22, 1990, meet the probability requirements.

At the time of promulgation of the UST rules in 1988, combining inventory control with the ATGS then in existence was required because ATGS had not been shown to meet the performance standard and probabilities. The Agency is now aware of more than 25 models which have been third-party certified as meeting them.

With regard to performance, a monthly test performed by an ATG which has been shown to meet the performance standard and probabilities is at least equivalent to monthly inventory control for a tank, and is usually much more rigorous.

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[1]40 CFR 280.43(h) states that "[a]ny other type of release detection method, or combination of methods, can be used if: (1) [i]t can detect a 0.2 gallon per hour leak rate or a release of 150 gallons within a month with a probability of detection of 0.95 and a probability of false alarm of 0.05; or ..."

Finally, the above interpretation is consistent with the Agency's intent at the time of promulgation of the UST rules. For example, the preamble to the final rule states , at 53 Fed. Reg. 37150-37151, "Currently, conducting monthly tank tightness testing is not a practical or economical method. Tank testing methods may be developed in the future, however, that can be performed on a monthly basis to detect leaks of 0.2 gallon per hour. The final rule allows the use of this method without inventory control once the method is proven to meet the performance standard...." The interpretation also is consistent with the Agency's intent to encourage gradual movement toward general performance standards, as opposed to method-specific requirements. (See, for example, 53 Fed. Reg. 37144 and 37166.)

As you know, state UST programs may impose more stringent requirements than the federal regulations. The owner and operator should check with the state to determine whether the state regulations are different than the federal rule.

The Agency believes that inventory control is a very useful tool in the comprehensive management of a UST system and encourages its use in conjunction with other methods as a matter of prudence. EPA also encourages owners and operators to perform ATG leak tests more frequently than the monthly minimum, in order to detect leaks earlier and from any portion of the tank that routinely contains product. Each ATG should be properly programmed and calibrated for its particular tank.

If you have any further questions, please contact Randy Nelson at (913) 551-7220 or David Wiley at (703) 308-8877.

Sincerely,

/s/

David W. Ziegele, Director
Office of Underground Storage Tanks

Enclosures (2)

cc: UST/LUST Regional Program Managers
UST/LUST Regional Branch Chiefs, (w/o enclosures)
UST/LUST Regional Counsels
OUST Management Team, (w/o enclosures)
Shonee Clark, OUST, (Compendium)
Dawn Messier, OGC
Randy Nelson, Region 7
Milton Robinson, OECA
Barbara Simcoe, ASTSWMO
David Wiley, OUST

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 18, 1989

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

R. Sarah Compton, P.C.
McDermott, Will & Emery
1850 K Street, N.W.
Washington, D.C. 20006-2296

Dear Ms. Compton:

This is in reply to your letter of March 21 concerning tank monitoring systems and inventory control. Under EPA's regulations any automatic in-tank monitor capable of detecting a release of 0.2 gallons per hour with a 95% probability of detection and a 5% probability of false alarm need not be supplemented with inventory reconciliation.

I hope this information is helpful.

Sincerely,

/s/

Jim McCormick, Director
Policy & Standards Division
Office of Underground Storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 18, 1993

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Inconclusives with Statistical Inventory Reconciliation

FROM: David Ziegele, Director /s/
Office of Underground Storage Tanks

TO: UST/LUST Regional Program Managers
UST/LUST Regional Attorneys

Staff in several regions have asked us to provide guidance in response to the following question:

> During an inspection, is the facility out of compliance if the release detection method in use is statistical inventory reconciliation (SIR), and a monthly report shows "inconclusive"?

The Federal regulations require that all release detection methods (with the exception of the combination of tightness testing and inventory control) be conducted at least every 30 days for USTs and associated piping. An inspector should review the release detection test results for the Method being applied at that facility. With SIR, the inspector will review monthly test results for 12 consecutive months, and one test must fall within each month of the previous 12 months. If a test result is missing, inconclusive, or if a test was not conducted, the owner and operator are in violation of 40 CFR § 280.41.

If annual tank tightness testing is used in conjunction with inventory control, for example, a valid annual test result must be available, as well as the previous twelve months of reconciled inventory records. Likewise, conclusive test results for the previous twelve months must be available when SIR is used as the monthly method. If an owner or operator has one or more inconclusive SIR test results for the previous 12 month period, he or she is in violation of the release detection requirements and is not conducting adequate release detection.

Valid and conclusive test results are required and must be available for review for the facility to be in compliance. An owner or operator cannot wait until the next month (or year) before testing again. The owner or operator must provide adequate inventory records and his or her equipment must be functioning properly to obtain valid test results. If not, the facility is not conducting release detection in accordance with the Federal regulations and therefore is not in compliance.

Sometimes when SIR is first applied to a facility, inconclusives are reported for the first month or two -- until problems such as imprecise inventory practices are corrected. To avoid being out of compliance, we recommend that these facilities continue to practice another leak detection method as a backup until such time as they have received conclusive test results from the SIR vendor for two consecutive months.

Of course, inspectors should use their enforcement discretion as appropriate. An example might be the case of only one inconclusive result. SIR vendors have procedures for investigating the cause of inconclusive results, and an inspector may take into consideration the extent to which they were followed and the problem addressed.

Because of the growing use of SIR, I plan to send copies of this memorandum directly to State UST managers in the near future. If you have any questions or need additional information, please contact Randy Nelson (913-551-7220) or David Wiley (703-308-8877).

cc: UST/LUST Regional Branch chiefs
Dawn Messier, OGC
Milton Robinson, OECA
OUST Management Team

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 7, 1994

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Seth C. Hunt, President
USTMAN Industries, Inc.
12265 W. Bayaud Ave., Suite 110
Lakewood, Colorado 80228

Dear Mr. Hunt:

Thank you for your letters of December 17, and December 30, 1993 (enclosed) expressing concerns with my November 18, 1993 memorandum (also enclosed) regarding inconclusive results and the statistical inventory reconciliation (SIR) method of release detection. You voice several concerns, but there are two that seem most important. The first is your concern about the possibility of inspectors pursuing enforcement actions against underground storage tank (UST) facilities with as few as one result that is not conclusive during the period prior to the issuance of my memorandum. The second main concern regards the use of the term “inconclusive.”

We have reviewed this issue, and our interpretation remains that stated in the November 18, memorandum, that is, that EPA’s UST release detection regulations require an owner or operator to use a method that conclusively meets the performance standards to be in compliance. By conclusively we mean making a determination against a standard, such as a leak rate, with the required probabilities of detection and of false alarm. 40 CFR 280.41(a) requires generally that “tanks must be monitored at least every 30 days for releases using one of the methods listed in 280.43(d) through (h)....” SIR, when used as a 30-day method, falls under 280.43(h), which states that “any other type of release detection method, or combination of methods, can be used if: (1) <u>It can detect</u> a 0.2 gallon per hour leak rate or a release of 150 gallons within a month with a probability of detection of 0.95 and a probability of false alarm of 0.05...” (emphasis added). A result that is not conclusive indicates that the method, as performed in a particular instance, cannot meet the required performance standard. Therefore, if this test is the only one conducted during a 30-day period, the owner or operator is not in compliance with the regulations.

In addition 40 CFR 280.40(a)(2) requires that methods be “installed, calibrated, operated and maintained in accordance with the manufacturer's instructions, including routine maintenance...” It is the responsibility of owners and operators to collect data that is complete enough and of sufficient quality to perform leak detection properly. In cases of results which are not conclusive and which are due to none error on the part of the party using the method, it is likely that such results could indicate a violation of this provision as well.

In response to your first main concern, contrary to the assertion in your letter, this is not a new requirement, but a clarification of how the existing requirements apply to SIR. However, we understand that some people have not had this understanding. Therefore, in cases of a lack of a conclusive SIR result for a single month in the past, by copy of this letter, we encourage States and Regions to consider, among other factors, the efforts of owners and operators to comply in assessing the appropriate enforcement response, if any. This is in keeping with the enforcement discretion I noted in my previous memorandum.

In addition, my memorandum stated that inspectors at sites using SIR will review monthly test results for 12 consecutive months. Of course, this is not the case if the facility had begun using SIR more recently than 12 months ago. For whatever monthly leak detection method or combination of methods, owners and operators must, per 280.45(b), maintain records of monitoring for at least one year, or another reasonable period of time determined by the implementing agency.

Your second main concern is that the interpretation could be applied only to SIR results that use the term "inconclusive," and not to results that are reported in some other way. To restate, owners and operators relying on SIR to meet monthly leak detection requirements must obtain a <u>conclusive</u> result of a test which can meet the performance standard of 40 CFR 280.43(h) (1) A lack of this conclusive result may be indicated in various ways; the use of the term "inconclusive" is only one of the ways.

Another concern you express is about the initial evaluation of vendor's SIR methods, which typically are third-party certifications following guidance in EPA's <u>Standard Test Procedures for Evaluating Leak Detection Methods</u>. It is true that in this evaluation results that are not conclusive are acknowledged in the procedures, but these evaluations are intended to demonstrate that the method is generally capable of meeting the performance standard, not that it can in any particular instance.

You also express the opinion that, in lieu of the reasoning above, EPA should interpret the release reporting requirements of 40 CFR 280.50(c) as requiring that results that are not conclusive be treated as suspected releases. However, results that are not conclusive do not constitute "monitoring results" that "indicate a release may have occurred." The lack of a conclusive result simply indicates that it was not possible, using the data available, to determine if a release of 0.2 gallons per hour had occurred within the probabilities of detection and false alarm required by EPA's regulations. These requirements, though related to the release detection requirements noted above, do not address the actual performance of release detection, and therefore cannot be relied on for a determination of compliance with the release detection requirements.

I want to reiterate that we understand that conclusive results may not be possible in a small percentage of the tank data that are analyzed each month with SIR, as with other methods, and that there are several reasons for this. We know that an important difference between SIR and other methods is that, because SIR depends on data collected over a period of several days, a retest cannot be conducted as quickly as with other methods. Our goal is to promote compliance by encouraging effective leak detection practices. Our interpretation is in keeping with the regulations' emphasis on frequent monitoring as important in protecting the environment. I also would like to reiterate that information on the performance of SIR in the field would be of great interest to regulators. I hope that this letter is helpful in addressing your concerns.

Sincerely,

/s/

David W. Ziegele, Director
Office of Underground Storage Tanks

Enclosures:
11/18/93 letter from David Ziegele
12/17/93 letter from Seth Hunt (without enclosure)
12/30/93 letter from Seth Hunt (without enclosure)

cc:
UST/LUST Regional Program Managers
UST/LUST Regional Branch chiefs
UST/LUST Regional Attorneys
OUST Management Team
State UST Program Managers
Dawn Messier, OGC
Randy Nelson, Region 7
Milton Robinson, OE
David Wiley, OUST

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 13 1995

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

W. Dale Tanke
Storage Tank Safety Engineer
Division of Petroleum and Chemical Safety
Office of Illinois State Fire Marshal
1035 Stevenson Drive
Springfield, IL 62703-4259

Re: Siphon bars connecting underground storage tanks.

Dear Mr. Tanke:

This is in response to your letter of May 23, 1994 to Gerald Phillips of Region V (copy enclosed), as well as subsequent conversations with Bill Faggart of our office, relating to the use of siphon bars connecting multiple underground petroleum tanks. You expressed concern that siphon bars are a source of leaks in underground storage tank (UST) systems and should thus be required to have leak detection and corrosion protection.

The UST community should be aware that existing leak detection and corrosion protection regulations already address siphon bars as part of UST systems. Under 40 CFR §280.12, an UST system is comprised of an underground storage tank(s), connected underground piping, underground ancillary equipment, and containment system, if any. Owners and operators of new and existing UST systems must provide a method or combination of methods of release detection that can detect a release from any portion of the tank and the connected underground piping that routinely contains product (40 CFR §280.40(a)). Inasmuch as siphon bars routinely contain product, they are regulated as part of the underground piping.

That having been said, the siphon systems you describe operate and are regulated in the same manner as safe suction product dispensing systems. If a hole develops in the siphon bar, the product level in the bar drops to the height of the product in the tank. If the size of the hole is small enough that an air bleeder line can compensate and reestablish the siphon, air (or groundwater) would be pulled into the siphon bar during operation of the pump. When fuel dispensing halts, the vacuum would again be lost and product would return to the tanks. Therefore, for a properly designed and installed siphon bar, no release detection is required (40 CFR §280.41(b)(2)). As for the issue of releases during filling, note that forced cascading of product due to intentional overfill during fill operations is an improper operating procedure. Transfer operations must be monitored to prevent overfills (40 CFR §280.30(a)).

The federal regulations are also relevant to the corrosion issue you raised. Piping installed since December 22, 1988 that routinely contains regulated substances and is in contact with the ground must be properly designed, constructed, and protected from corrosion (40 CFR §280.20(b)). Effective December 22, 1998, this requirement extends to all UST system piping, no matter when installed. Siphon bars on such systems must therefore be protected from corrosion.

With respect to your concern that inventory control should not be allowed as an acceptable means of leak detection for multiple tank systems connected with siphon bars, we agree that inventory control, alone, is unacceptable. Periodic tightness tests are also required. As you point out in your letter, it is during these tightness tests that problems with siphon bars are often discovered. Further, it should be noted that the federal UST regulations limit the period of time inventory control with tightness testing (ICTT) can be used at all. ICTT can be used on systems installed prior to December 22, 1988 only until December 22, 1998. Systems installed or upgraded to new tank standards after December 22, 1988 can continue to use ICTT for ten years subsequent to the installation or upgrade.

In view of the fact that siphon bars and manifolded tank systems are addressed under existing UST regulations, the Office of Underground Storage Tanks has no plans to impose additional requirements. Of course, state programs are at liberty to develop regulations that are more stringent than the federal regulations. Illinois' own decision to disallow the use of siphon bars is one such example.

Thank you for your input on this technical issue. I hope that this letter is helpful in allaying your concerns.

Sincerely,

Lisa Lund, Acting Director
Office of Underground Storage Tanks

Enclosure

cc: UST/LUST Regional Program Managers
Dave Webster, New England Region
Stan Siegel, Region II
Robert Greaves, Region III
Mary Kay Lynch, Region IV
Norman Niedergang, Region V
Guanita Reiter, Region VI
Lynn Harrington, Region VII
Robert Duprey, Region VIII
Laura Yoshii, Region IX
Ken Feigner, Region X
UST/LUST Regional Counsels
State UST Managers
OUST Management Team
Shonee Clark, OUST (Compendium)
Randy Nelson, Region VII
Dawn Messier, OGC

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 7, 1995

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Robert Staab, Manager
Environmental Compliance
The Circle K Corporation
PO Box 52084
Phoenix, AZ 85072-2084

Re: Transition from Manual Inventory Reconciliation with Annual Tightness Test to Monthly Statistical Inventory Reconciliation

Dear Mr. Staab:

This is in response to your letter of October 4, 1994 (copy enclosed) in which you request clarification as to the regulatory requirements associated with the transition from one form of leak detection to another.

First, changing from one acceptable leak detection method to another can be done at any time. Contrary to the assumption in your letter, Environmental Protection Agency (EPA) regulations do not require that once a method is chosen, it must be used for a full, twelve-month “cycle.” Consequently, once you successfully switch over to an acceptable monthly monitoring method, you do not need to continue manual reconciliation of inventory records. Similarly, pursuant to the Federal regulations (40 CFR §280.41(a)), migration to an acceptable monthly monitoring method negates the need to perform an annual tank tightness test. (Note, however, that, depending on the type of piping system employed and the type of release detection used, you may still be required to perform periodic line tightness tests.) Finally, regardless of method or change in method, you should ensure that all leak detection records are properly maintained in accordance with §280.45.

Of course, please keep in mind that states in which you do business may have additional requirements. Please consult with the underground storage tank programs in those states to learn of any state-specific conditions.

I hope this clarifies the issues you raised. Should you have further questions, please contact Bill Faggart at (703) 308-8897.

Sincerely,

/s/

Lisa Lund, Acting Director
Office of Underground Storage Tanks

Enclosure

cc: UST/LUST Regional Program Managers
Dave Webster, New England Region
Stan Siegel, Region II
Robert Greaves, Region III
Mary Kay Lynch, Region IV
Norman Niedergang, Region V
Guanita Reiter, Region VI
Lynn Harrington, Region VII
Robert Duprey, Region VIII
Laura Yoshii, Region IX
Ken Feigner, Region X
UST/LUST Regional Counsels
State UST Managers
OUST Management Team
Shonee Clark, OUST (Compendium)
Randy Nelson, Region VII
Dawn Messier, OGC

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 12, 1995

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. Robert Staab
Corporate Environmental Manager
Circle K Stores Inc.
P.O. Box 52084
Phoenix, Arizona 85072-2084

Dear Mr. Staab:

This is in response to your letter of September 18, 1995 (enclosed), in which you request clarification of certain reporting requirements under the federal underground storage tank (UST) regulations. Specifically, at issue is the interpretation of EPA's requirement for reporting that a release may have occurred based on inventory control results. 40 CFR §280.50 generally requires reporting of monitoring results from a release detection method that indicate that a release may have occurred unless: "in the case of inventory control, a second month of data does not confirm the initial result." 40 CFR §280.50(c) (2) (emphasis added).

EPA interprets the language "confirm the initial result" to mean that the difference between the physical and calculated inventories is greater in magnitude than the regulatory standard of 1% of throughput plus 130 gallons for a second month in a row, no matter whether the direction -- short or over -- is the same as the first month.

Thus the variance combinations of short-short, over-ov~er, short-over, and over-short must all be reported to the implementing agency within 24 hours, or another~time period specified by the implementing agency. Of course, a report is not required if immediate accounting corrections are made. Such corrections should be limited to recalculating and the reading of tank charts, and should not include revising raw data like stick readings, totalizer readings, or delivery volumes.

Since reporting suspected releases leads to release investigation, we recognize that a tightness test or a site check may be overkill in some cases. However, §280.52 provides flexibility by allowing investigation by "another procedure approved by the implementing agency.” By copy of this letter, EPA recommends that each implementing agency allow procedures as it deems appropriate in this case.

We believe that EPA's position is well-founded, reasonable, and furthers the goal of protecting human health and the environment without unduly burdening the regulated community. Revision of our guidance documents, which are consistent with this clarification, is therefore not necessary at this time. Please see the enclosed discussion paper, which provides background information and more detailed analysis.

Thank you for bringing your concerns to us. I apologize that EPA staff provided Mr. Esperson with a response counter to the above in an earlier telephone conversation. If you have any questions or comments on this issue, please contact David Wiley, at (703)308-8877.

Sincerely,

/s/

Lisa C. Lund, Acting Director
Office of Underground Storage Tanks

Enclosures:
Sept. 18, 1995 Robert Staab letter
Discussion paper

cc: Stephen Crimaudo, ASTSWMO
Larry Brill, Region 1
Stanley Siegel, Region 2
Maria Vickers, Region 3
Mary Kay Lynch, Region 4
Willie Harris, Region 5
Willie Kelley, Region 6
Bill Pedicino, Region 7
Stephen Tuber, Region 8
Laura Yoshii, Region 9
Lauris Davies, Region 10
Katherine Nam, OGC
Joan Olmstead, OECA
Shonee Clark :(Compendium)
OUST Management Team

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Discussion: Reporting Inventory Control Results

Background

The inventory control method of UST system leak detection involves comparing physical, "stick" liquid product inventories and calculated, "book" inventories. In common usage, a "short" results when physical inventory minus book inventory yields a negative number. Conversely, an "over" occurs when this number is positive.

EPA regulations [1] established a monthly standard maximum discrepancy between stick and book inventories of 1.0 percent of flow-through plus 130 gallons. In addition, the UST regulations [2] state that a report must be made to the implementing agency if "monitoring results from a release detection method .... indicate a release may have occurred unless .... [i]n the case of inventory control, a second month of data does not confirm the initial result" (emphasis added).

Circle K asserts that the language "confirm the initial result" means that there are either two consecutive "shorts" greater in magnitude than the. standard or two consecutive "overs" greater in magnitude than the standard. Circle K notes, however, that EPA's booklet Doing ***Inventory Control Right***[3] ***(DICR)*** and multiple regulatory agencies interpret this language to mean that two consecutive variances are greater in magnitude than the standard, no matter whether the variances are short or over.

Although reporting suspected releases leads to release investigation under the regulations, the regulations allow investigation by "another procedure approved by the implementing agency" [4] in addition to the listed procedures of system tests or site checks.

Clarification

EPA interprets the language "confirm the initial result" to mean that the variance is greater in magnitude than the regulatory standard for a second month in a row, no matter whether the direction -- short or over **--** is the same as the first month. In addition, EPA recommends that each implementing agency allow alternative procedures as it deems appropriate to satisfy the release investigation requirements.

Rationale

There are multiple reasons that EPA requires that a report be made regardless of whether variances are over or short.

The requirement is practical. An over or short monthly result indicates a leak or other material loss, a gain in stored material, or errors in the method such that the status of the UST system relative to the standard cannot be determined. The cases of concern to Circle K, that of an over-short combination and a short-over combination, indicate that inventory control, as performed, can be masking actual leaks and therefore cannot detect a leak at the standard flow rate, as required. This is true even if a mere accounting error is the reason for the variances. On occasion, these combinations also may be caused by an incorrect tank chart or a tank with a hole which is affected by fluctuating ground water levels. Aside from leak detection, such variances are bad for business, since the operator cannot detect short deliveries or thefts if data collection and reconciliation are not done properly. Thus, both overs and shorts are of concern, and any combination pair should be reported.

The clarification above is consistent with the regulatory record. Nothing in the UST technical regulations, in the preamble to the final rule [5], or in the public comments and responses to the proposed rule [6] is contrary to this clarification.

Furthermore, this clarification is consistent with previous guidance. Multiple other EPA documents [7,8] in addition to ***DICR*** explicitly agree with the clarification. Moreover, this interpretation is not strictly a view of regulatory agencies only. ***DICR*** was developed in cooperation with seven leading industry associations, and the American Petroleum Institute's (API's) recommended practice [9] interprets the issue in the same way as EPA.

In addition, the leak detection requirements are flexible and are not onerous. In setting the final UST technical standards, EPA chose an inventory control standard that was less stringent than it initially proposed, and less stringent than the one still found in API's recommended practice. EPA chose a less stringent requirement because it found that these other standards, as implemented in the real world, yielded a rate of false alarms that was unacceptably high. Thus, EPA finalized inventory control requirements which allow operators to, with some care, detect large leaks and other inventory problems without a large number of false alarms, essentially free of charge.. Those who, for whatever reason cannot perform inventory control sufficiently can choose from dozens of other leak detection systems available.

Likewise, the reporting and investigation requirements are not unduly burdensome. In the final rule, EPA relaxed the proposed reporting requirements for inventory control, by allowing the second month of data to be considered before reporting. Reporting in itself is not costly or time-consuming. State and EPA commenters did not feel that the reports are burdensome, either for agencies or for operators. The subsequent investigation need not be burdensome, either. The correction of calculations may be all that is required.

State agency officials who EPA contacted agree with the above interpretation, and generally support maintenance of the requirement. They cite a need to know all repeated variances, and some note that inventory control results which are not reported are a recurrent and serious problem, because real releases are not detected until their impacts are much worse than if variance results had been heeded.

Conclusion

In sum, the Agency believes the above clarification is not unduly burdensome and is consistent with good and practical UST management, with the regulatory record, with public and private sector guidance documents, and with protection of human health and the environment.

Notes

1. 40 CFR §280.43(a)

2. 40 CFR §280.50(c)

3. EPA, ***Doing Inventory Control Right: For Underground storage Tanks,*** Nov 1993, pp 12, Monthly Inventory Record.

4. 40 CFR §280.52

5. 53 ***Federal Register*** 37082-37194.

6. EPA, OUST, “Comment Summaries and Responses Documents for the Final Technical Standards and the State Program Approval Regulations,” 1988, p 17-8.

7. EPA, ***Detecting Leaks: Successful Methods Step-by-Step;*** Nov. 1989, pp 29-30.

8. EPA, OUST, ***Common Questions on Leak Detection,*** Feb. 1990, p 15.

9. American Petroleum Institute Recommended Practice 1621, ***Bulk Liquid Stock Control At Retail Outlets,*** May 1993, p 1.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460
Mail Code 5401G

JUL 25 1997

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Applicability Of A Combination Leak Detection Method For Upgraded Underground Storage Tanks

FROM: Anna Hopkins Virbick, Director
Office of Underground Storage Tanks

TO: EPA UST/LUST Regional Program Managers
State UST Program Managers

This memorandum clarifies an underground storage tank (UST) leak detection issue that affects a subset of existing USTs. This subset consists of existing USTs in which the tank itself meets 1998 standards for corrosion protection before or after the entire UST system meets 1998 standards for spill, overfill, and corrosion protection. A question has arisen as to the length of time this subset of existing USTs may use the leak detection method that combines monthly inventory control with tank tightness testing every five years for regulatory compliance. For convenience, in the clarification which follows, we will call this leak detection method the "combination method."

When can you start using the combination method as an approved leak detection method?

The federal regulations at § 280.41(a)(1) state that the combination method satisfies federal leak detection requirements only when applied to an UST system that meets the performance standards for new UST systems (at § 280.20) or upgraded UST systems (at § 280.21). Basically, these standards require the UST system to have spill, overfill, and corrosion protection for tanks and piping.

How long can an UST system use the combination method?

Federal regulations at § 280.41(a)(1) state that the combination method may be used for a maximum of 10 years after the tank is installed or upgraded with corrosion protection. *Note that this time period is based on the compliance status of the* ***tank only****, not the entire UST system.*

This information is basically consistent with EPA materials circulated to date and should create no confusion as long as: 1) the tank and the rest of the UST system are upgraded at the same time, or 2) the tank has corrosion protection added after the rest of the system has been upgraded. In these cases, USTs can use the combined method for 10 years after the tank has corrosion protection or December 1998, whichever date is later.

But what about the smaller subset of existing USTs in which the tank has corrosion protection ***before*** the rest of the UST system meets upgrade standards? In some of these cases, the combined method may not be valid for more than a few years. As noted above, the federal regulations at § 280.41(a)(1) state that once the entire system is upgraded the combination method can meet the federal leak detection requirements. However, § 280.41(a)(1) also establishes an ending date for the period during which this combination is valid. **The ending date is either 10 years after the date the tank has corrosion protection or December 22, 1998, whichever date is later.** Since the period of validity cannot begin until the whole system has met upgrade or new performance standards, the period of validity is less than 10 years in cases only where the tank has been protected from corrosion before the rest of the UST system meets the upgrade standards.

The sample cases which follow illustrate three typical situations:

Tank and other UST system components all upgraded at the same time: For example, a bare steel tank installed in 1980 is subsequently, in 1995, assessed by means of an internal inspection and is upgraded with corrosion protection, has spill and overfill protection added, and is equipped with new piping. This UST system can use the combination method from 1995 until 2005, which is the later of the two potential ending dates (either 1998 or 10 years following the date the tank has corrosion protection). After 2005, the UST in this example must use a monthly monitoring method.

Tank has corrosion protection added after the rest of the UST system meets upgrade standards: For example, a bare steel UST installed in 1980 has its piping upgraded and spill and overfill protection added in 1993, but the tank is not upgraded with corrosion protection until 1995. This UST system can use the combination method from 1995 until 2005, which is the later of the two potential ending dates (either 1998 or 10 years following the date the tank has corrosion protection). After 2005, the UST in this example must use a monthly monitoring method.

Tank has corrosion protection *before* the rest of the UST system meets upgrade standards: For example, a bare steel tank is upgraded with corrosion protection in 1986 (or the tank is made of noncorrodible material and installed in 1986), but the piping, spill, and overfill upgrades were not added until 1995. This would mean that the UST system could start using the combination method to meet federal leak detection requirements only in 1995 (when the full system first met all upgrade standards) and could use the combined method only until 1998 (the date which is the later of either 1998 or 10 years after the tank has corrosion protection). In this example, the UST may use the combined method to meet federal leak detection requirements only for three years (from 1995 to 1998). After 1998, the UST in this example must use a monthly monitoring method.

You should be aware that these qualifications apply also to USTs ranging in capacity from 1,001 to 2,000 gallons that use a variant of this combination method. These small USTs are allowed to use a combined method of manual tank gauging with tank tightness testing every five years with the same qualifications noted above for USTs using the method that combines inventory control and tank tightness testing. (Please note that the requirements for "manual tank gauging" differ greatly from the requirements for "inventory control"; do not confuse these two separate leak detection methods.)

In all cases, when the combination method can no longer be used, monthly monitoring is required by the federal leak detection regulations. Approved monthly monitoring methods are identified in § 280.43 (b), (d)-(h) as manual tank gauging (only for tanks 1,000 gallons or smaller), automatic tank gauging, vapor monitoring, groundwater monitoring, interstitial monitoring, and other methods, such as statistical inventory reconciliation, that meet performance standards or are approved by the implementing agency as equally effective in detecting leaks.

If USTs are not using monthly monitoring or are not eligible to use the combination method (as in the examples above when the entire UST system has yet to meet upgrade standards), the only allowable leak detection method is ***annual*** tightness testing combined with inventory control. However, USTs lacking full system upgrade can use this method only until December 1998, after which they must be replaced by new USTs, upgraded to meet 1998 standards, or be properly closed.

Some questions have arisen as to when the tightness tests required "every five years" must take place. There is potential confusion if the UST can use the combination method as a valid method for a number of years that is not a multiple of five years, for example, for three or eight years. While a tightness test is probably beneficial, EPA's regulations do not require testing at the end of the period of validity. Thus the requirement for testing at least every five years for a tank that may only use the combination method for three years does not require a test at the third year. However, over an eight-year period it does require at least one test in either the third, fourth, or fifth year, so that no more than five years elapse between the tightness test and both the beginning and the end of the leak detection method's period of validity.

Hazardous substance tanks are generally not impacted by this clarification, because after December 22, 1998 they must begin monthly interstitial monitoring unless a variance is granted by the implementing agency.

For many older tanks, December 22, 1998 is the deadline for changing to stand-alone monthly monitoring methods, and is thus an important release detection deadline as well as a corrosion, spill, and overfill protection deadline.

Finally, please note that some implementing agencies have more stringent or different requirements. For example, some implementing agencies have adopted more stringent leak detection requirements for certain tanks upgraded under § 280.21(b)(2)(iv) regarding alternative integrity assessment methods used before upgrading steel tanks with cathodic protection. In these cases, if the implementing agency requires stand-alone monthly monitoring, today's clarification regarding the applicability of the combination method of leak detection does not apply (see memorandum dated July 25, 1997, "Guidance On Alternative Integrity Assessment Methods For Steel USTs Prior To Upgrading With Cathodic Protection").

This memorandum provides final clarification to the issue addressed in our draft circulated April 15, 1997, titled "Transmittal of Draft Interpretation of Leak Detection Requirements where a Tank Meets 1998 Standards at a Different Time than Other UST System Components." If you have any questions about this memorandum of clarification, please contact OUST's David Wiley (phone 703 603-7178 or e-mail **wiley.david@epamail.epa.gov**).

cc: EPA UST/LUST Regional Program Managers' Supervisors
Kathy Nam, OGC
Joan Olmstead, OECA
Larry Magni, American Petroleum Institute
Sullivan Curran, Fiberglass Tank and Pipe Institute
Marc Katz, National Association of Convenience Stores
Bob Renkes, Petroleum Equipment Institute
John Huber, Petroleum Marketers Association of America
Mark Morgan, Petroleum Transportation & Storage Association
Roy Littlefield, Service Station Dealers of America
Wayne Geyer, Steel Tank Institute
Tom Osborne, Society of Independent Gasoline Marketers of America
Kimberly Michienzi, Booz Allen Hamilton (Hotline)
OUST Program Directions Team
OUST Desk Officers
Betty Arnold, Compendium of Technical Interpretations

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Release Investigation, Confirmation, and Corrective Action References

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 4 1989

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. Garah F. Helms
Chairman, USWAG Tanks Committee
Utility Solid Waste Activities Group
c/o Edison Electric Institute
Suite 601
1111 Nineteen Street, N.W.
Washington, D.C. 20036

Dear Mr. Helms:

This responds to your enclosed February 21, 1989 request for EPA guidance on whether the typical response actions of the utility industry to various types of confirmed releases from underground emergency generator tanks at nuclear power stations are in conformance with the final UST corrective action regulatory requirements of 40 CFR 280.61 (b) and 280.62 (a)(l). In general, we can affirm your basic understanding that when a release from an emergency generator tank is confirmed, the nuclear facility's owner and operator must begin to take immediate action to prevent further releases, including action that leads to the removal of as much of the regulated substance from the UST system as is necessary.

Section 280.61 (b) requires that within 24 hours some form of immediate action be taken to prevent any further release. Unless, directed to do otherwise by the implementing agency, section 280.62 (a) (1) also requires the removal of as much of the regulated substances from the UST system as is necessary to prevent further release into the environment. However, these two provisions were not intended to require that all regulated substances must be removed, from even begun to removed, from every suspect tank within 24 hours of release confirmation. EPA recognizes that such quick action may be unnecessary or physically impossible at many sites.

Although removal of product from the tank within 24 hours is not always achievable or necessary, it may sometimes be a necessary abatement measure to protect human health and the environment; for example, when there is a threat of a continued and rapid loss of product into the environment. Where alternative fuel supplies can be provided in a timely manner, it may also be the preferred approach with slowly leaking emergency generator tanks at nuclear facilities in order to minimize the cost and complexity of the required corrective action. Of course any fire, explosion, or vapor hazards due to leaking UST systems must always be identified and immediately mitigated, regardless of whether or not the tank is immediately emptied. Also, the owner and operator must initiate an investigation to determine if free product is present and, if so begin its removal as soon as practicable. Such corrective action steps must proceed in a timely manner and be reported to the implementing agency as required in the regulations.

I hope this letter provides the clarifications you need on this subject. If we can be of any more assistance in this matter please let me know.

Sincerely,

James McCormick, Director
Policy & standards Division
Office of Underground Storage Tanks

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 1 1989

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. R. C. Cronau
President
R.C. Cronau and Associates, Inc.
14189 Hiland Place
North Huntingdon, Pennsylvania 15642

Dear Mr. Cronau:

This is in response to your letter of August 21, 1989, requesting clarification of EPA's regulatory requirements for investigating and confirming suspected releases at underground storage tanks Systems. In your letter you cited two specific cases where a tight tank was required to be removed because it failed tank tightness tests. Your letter questioned whether these removals were required by the EPA regulations. They were not.

The specific requirement in 40 CFR 280.52(a)(l), which is for those UST system owners and operators who are using a second tightness test to confirm a suspected release, mandates that an UST system owner and operator must repair, replace or upgrade the UST system and begin corrective action in accordance with Subpart F if the test results for the system, tank or delivery piping indicate that a leak exists. Thus, in the EPA's requirements did not mandate tank removal but also allowed for tank repair or upgrading.

Your letter did not provide specifics about the type of tank and the particular site conditions (e.g. nearness to any public or private drinking water wells) so I cannot comment on which release investigation option was best suited to be followed at the site. However, one of the first corrective action steps required in Subpart F is to stop all confirmed leaks (280.61(b)) and immediately conduct a “site check” (280.62(a)(5)). Thus, in the case you cited, certainly removal of product from the tank and external monitoring of the excavation area were required by the regulations (in light of the fact that two tightness tests were failed): product removal to prevent possible further release into the environment, and external monitoring, such as a quick vapor survey of the surrounding excavation area to determine the extent of the release and the presence of any free product. If the above regulatory procedures were followed in both of your cited cases it is probable that product would not have been detected and the tanks would not have been pulled. If the tank was a fiberglass or protected tank the initial tightness testing results should have been questioned as suspect and external monitoring (the 280.52(b) site check option) could have straightened this out.

The EPA release reporting, investigation and confirmation regulations are flexibly written to enable owner and operator choices as well as the exercise of some discretion on the part of implementing agencies to suit the situation at hand. It is unfortunate that two faulty tightness tests led to the removal of tight tanks in Ohio. The federal requirements did not mandate removal unless repair or upgrading was impossible (as required under 280.52(a)), or the Implementing Agency decided that initial abatement measures and site check activities required under 280.62 necessitated tank removal.

The site investigation checklist you referred to in your letter is generally accurate, but only in as far as it goes. Steps 1-4 of the checklist apply only to tightness testing using an overfill-type test method. The use of level-measuring or acoustic methods, for example, would obviate the need for excavation down to the top of the tank because such methods do not involve overfilling the tank. Therefore, loose fittings on top of the tank could not be the cause of the failed test. (which is most often the cause of a failure using overfill-type methods). Also, using the site check alternative (280.32(b)), the procedure you provided would begin with step 5. As I mentioned earlier, tank repair or lining may be not allowed by the Implementing Agency if, in their judgement, tank removal is needed at a particular site to successfully conduct the corrective action/abatement and site characterization actions required under subpart F of the regulations.

I hope the above provides the clarification you seek about EPA's release confirmation requirements. I an sorry you were confused by the response you received from the RCRA/Superfund Hotline. Please also be advised that State UST regulatory programs are specifically allowed under the Federal law to be more stringent than EPA if they so choose, including in their requirements for investigating and confirming releases.

Sincerely,

David O'Brien, Chief,
Standards Branch

enclosure (incoming letter)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

1991

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Honorable Jesse A. Helms
United States Senate
Washington, D.C. 20510

Dear Senator Helms:

Thank you for your transmittal to the Environmental Protection Agency (EPA) of a letter dated March 11, 1991 from one of your constituents, Ms. Faye S. Brittain, concerning her mother's underground storage tank (UST) problem. Apparently, while conducting soil borings to determine the horizontal and vertical extent of soil contamination in the area of some USTs recently being removed from operation at her site, some contamination was discovered at the opposite side of her lot where they were planning to locate some new tanks. She wanted to know whether they might be forced to remove some of this soil that might have been contaminated over forty or fifty years ago where an aging tank was removed over thirty-six years ago.

Our reading of her letter suggests there may already be a leak from the operating USTs, and they are trying to characterize and deal with this problem. Thus, they are probably already in contact with the State UST regulatory program about this site. We recommend that Ms. Brittain and her mother continue to openly discuss this evolving situation with the responsible State program officials. It is basically the State’s decision as to whether or not the soil in the area of the old release must be removed. In North Carolina, the UST program can be contacted at:

Division of Environmental Management
Ground-Water Operations Branch
Department of Natural Resources and
Community Development
P.O. Box 27687
Raleigh, NC 27611-7687
919-733-3221

I hope the above information satisfactorily addresses the concerns raised by your constituent. please feel tree to contact me should you~have any further questions on this matter.

Sincerely,

David W. Ziegele, Acting Director
Office of Underground storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 27 1989

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. Gregory P. Underwood
Senior Environmental Engineer
Clayton Environmental Consultants, Ltd.
949 McDougall
Windsor, Ontario N9A IL9

Dear Mr. Underwood:

This responds to your December 22, 1988 letter to the Office of Underground Storage Tanks requesting clarification of EPA's final regulations for reporting releases from underground storage tanks (40 CFR Part 280, Subpart E). I hope this provides the clarifications you need.

Under these new regulations, any leak that is discovered must be reported immediately to the implementing agency and action undertaken by the owner and operator to stop additional releases. For example, the preamble to this section of the rule (53 FR September 23, 1988, p.37170) describes that the discovery of a Suspected release due to off-site impacts, or the physical presence of a release in the environment, warrants reporting. Also, under some condition., it may be necessary to report inventory discrepancies immediately (such as a significant drop in inventory level overnight). Otherwise, because of the inexactness of this method, inventory discrepancies must be reported only after being confirmed by a second month of data.

In your letter you suggest that an owner and operator does not have to report a suspected release under 280.50(c), unless the monitoring method detecting the release is required to be phased in under the "schedule for phase-in of release detection" in 280.40(c). We do not share this interpretation. EPA requires suspected release reporting regardless of whether a method of detection was used earlier than the regulation's minimum compliance phase-in dates. Non-reporting would be a violation of 280.50(c) which mandates owner and operator reporting of monitoring results indicating a suspected release.

There are two caveats to the above general requirement for reporting all suspected releases. First, suspected release reporting is not required if the check of the device shows it to be defective and its immediate repair, recalibration, or replacement does not confirm the initial result (280.50(c)(l)). Second, suspected release reporting is not required if the release detection method used is not one of the general types of methods specified under 280.41 and 280.42 and therefore, cannot be used to comply with the final rule's requirements for release detection. For example, if an owner and operator practices inventory control and reconciles the data monthly in accordance with the standard in 280.43(a), a suspected release must be reported to the implementing agency when the second month of data confirms the initial result (using the criterion in 280.43(a)). However, if an extensive inventory analysis service is provided to the owner and operator which claims to be able to detect a 0.1 gallons per hour leak, such a ”suspected release” under this vendor provided (not EPA required) method would not have to be reported because EPA has not accepted such results as a valid indicator of a possible release. In this second case, the “suspected release” results are not due to an EPA required method and are therefore not considered valid for leak detection purposes under the rules.

In summary, whether or not an owner and operator conducts monitoring before the regulatory minimum compliance due dates, a suspected release must be reported within 24 hours (or some other reasonable tine frame specified by the implementing agency) if it is discovered using one of the EPA required methods that are specified in 280.41 and 280.42. EPA has not intended to allow corrective actions (under Subpart F) identified as needed at specific UST sites to be delayed by the phase-in dates for the required release detection. whenever an UST release is discovered or legitimately suspected it must be reported, confirmed and dealt with in accordance with the appropriate sections of the final rules.

Your letter suggests that owners and operators will be discouraged from undertaking monitoring earlier than is required it they have to report and deal with any releases that are thereby discovered. EPA has concluded that timely responses to suspected releases (while the extent of contamination is still limited) is in the best financial interest of the owner and operator because it is the approach most likely to avoid large corrective action costs. Thus, we encourage UST owners and operators to install one of the required release detection methods as soon as possible, and we believe it is in their best interests to do so.

If I can be of any more service in this matter please let me know

Sincerely,

Dave 0'Brien, Chief
Standards Branch
Office of Underground Storage Tanks

Closure References

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 16 1990

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Honorable Donald W. Riegle
United States Senator
Central Regional Office
705 Washington Square Building
109 West Michigan Avenue
Lansing;: Michigan 48933"

Dear Senator Riegle:

Thank you for your letter of January 25, 1990, on behalf of your constituent, Mrs. Erna Seiss, who requested information about closure requirements for underground storage tanks (USTs) that were closed nearly 30 years ago.

Federal UST regulations do not require that all USTs closed before the regulations became effective (December 1988) meet the full range of closure requirements, which can include tank removal or closure in place and site assessment. Instead, EPA believes that -- for tanks closed before December 1988-- the closure provisions should only be applied selectively under the discretionary authority of the implementing agency, in your constituent's case, the Michigan Fire Marshal. These agencies are in the best position to identify old tanks that may have been improperly closed, and to gauge the nature and extent of the threat posed by those tanks. Thus, the regulations do not require owners and operators of previously closed tanks to comply with the closure provisions unless they are directed to do so by the implementing agency when it determines there is a reasonable probability that the tank poses a potential threat to human health and the environment either now or in the future. There are no "waivers" available from EPA that would remove any requirements placed on your constituent's USTs as determined by the Michigan Fire Marshal.

I hope that the information in this letter will be helpful to you in responding to your constituent. Please do not hesitate to contact me if I can be of any further assistance.

sincerely yours,

Ronald Brand, Director
Office of Underground Storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR 28 1990

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Honorable Marvin Leath
House of Representatives
Washington, D.C. 20515

Dear Mr. Leath:

Thank you for your letter of March 1, 1990, on behalf of your constituent Mr. Conner S. Scott, who wanted clarification concerning the effect on closed tanks on the Federal regulations for underground storage tanks (USTs).

Let me begin by providing some background on these new rules. In 1984, Congress responded to the increasing threat to ground water from leaking USTs by adding Subtitle I to the Resource Conservation and Recovery Act. This section of the law required the Environmental Protection Agency to develop a comprehensive regulatory program for USTs. Congress directed us to publish regulations that would require tank owners and operators to prevent and detect leaks from new tanks and tanks already in the ground, to clean up leaks from these tanks, and to show that they are financially capable of cleaning up any leaks that could occur and compensating third parties for any damages resulting from such leaks. For your constituent's information, I have enclosed copies of two brochures (“Musts for USTs” and “Dollars and Sense”) that summarize the regulations in "plain English."

According to your constituent's letter, the Phillips brothers' USTs have not been in operation since approximately 1980. Based on this information these tanks are not subject to the Federal closure requirements un1es the implementing agency decides this action is necessary. Each state implementing agency can design a regulatory program based on their state's needs and the Texas Water commission has adopted closure requirements different from the Federal standards. These more stringent rules reflect the State's choices about how best to protect their groundwater.

I hope that the information we have provided will be helpful to you in responding to your constituent. Please do not hesitate to contact me if I can be of any additional assistance.

Sincerely,

[Unknown Signer/Signature]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

1990

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. Christopher C. Gilmore
P.O. Box 5360
Beaumont, Texas 77726-0360

Dear Mr. Gilmore:

Thank you for your letter of March 20, 1990, in which you requested information on closure requirements for abandoned underground storage tanks (USTS).

Let me begin by providing some background on the Federal regulations for USTs. In 1984, Congress responded to the increasing threat to ground water from leaking USTs by adding subtitle I to the Resource Conservation and Recovery Act. This section of the law required the Environmental protection Agency (EPA) to develop a comprehensive regulatory program for USTs. Congress directed us to publish regulations that would require tank owners and operators to prevent and detect leaks from new tanks and tanks already in the ground, to clean up leaks from these tanks, and to show that they are financially capable of cleaning up any leaks that could occur and compensating third parties for any damages resulting from such leaks. For your information, we have enclosed copies of two brochures (“Musts for USTs” and “Dollars and Sense”) that summarize the regulations in“plain English.”

Your letter does not indicate when the USTs in question were closed or abandoned, and this date determines which of the following actions are appropriate. Tanks closed or abandoned after the effective date of the UST regulations (December 22, 1988) need to meet the Federal closure requirements described in the enclosed “Musts for USTs.” However, State requirements can be more stringent than Federal requirements. Although site assessment is one of the Federal requirements, EPA does not directly conduct these inspections. For information on specific closure requirements and procedures in your state, you should contact Jackie Hardee, UST coordinator for the Texas Water commission, at (512) 463-8180. For information on proper tank closure procedures, you may want to consult "Tank Closure Without 'Tears" (see the second page of the enclosed publications list for ordering instructions).

Tanks closed or abandoned before the effective date of the UST regulations (December 22, 1988) need to meet Federal closure requirements only if the State implementing agency decides this action is necessary. State environmental regulators can require owners of these USTs to investigate their UST sites for contamination caused by leaking USTs and to close their USTs permanently in accordance with applicable State and Federal requirements for tank closure (as described in the enclosed "Musts for USTs")

The Agency has given this discretionary authority to 1ocal implementing agencies because these agencies are in the best position to identify abandoned tanks that may have been improperly closed, and to gauge the nature and extent of the threat posed by those tanks. They are also better able to identify the responsible owners and define the appropriate site assessment techniques. Thus, the Federal UST regulations require owners and operators of abandoned tanks to comply with the closure provisions if so directed by the implementing agency when it determines there is a reasonable probability that the tank poses a potential threat to human health and the environment.

You should note, however, that if at any point before permanent closure the USTs in question should ever be reactivated, the State environmental agency would have to be notified and the USTS would need to meet all the requirements for active USTs (as described in the enclosed brochures).

I hope that the information we have provided will be helpful to you. Please do not hesitate to contact me if I can be of any additional assistance.

sincerely,

Ronald Brand, Director
Office of Underground Storage Tanks

Enclosures

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

February 26, 1991

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr Wallace Putkowski
Carbon Service Corp.
52 Fairview Drive
Lehighton, PA 18235-9081

Dear Mr. Putkowski:

Thank you for your January 21, 1991 letter to the Environmental Protection Agency (EPA) in which you question whether EPA's requirement for a 30 day prior notification to the implementing Agency is really necessary before closing an underground storage tank (UST). You point out that this can result in a delay in proceeding with construction that can prove costly to small operators.

Let me state for the record that EPA's regulatory requirements calling for prior notice of 30 days before closing an UST are simply intended to allow State or local agencies sufficient time to inform the operator of what closure requirements to follow and to perhaps enable arrangement of an on-site visit by a local inspector during closure. Our intent was not to automatically delay closure actions 30 days and thereby increase the construction and rent costs of small operators.

Our regulations do allow State programs to seek approval to substitute their own requirements for EPA's, including employing different approaches to this notification before closure requirement. You may want to direct your concern about the need for change or flexibility in this area to your State's UST program.

The States are the focal point for implementation of this program, and perhaps they already have an alternative procedure in place in your State. The key is that proper closure steps be followed and the implementing agency be given an opportunity to advise or oversee this work before it is undertaken. Thirty day prior notice appears to be reasonable from a national perspective, however, we fully intend to be flexible about allowing different State requirements on this issue, including State approaches that allow for shorter notification periods.

I suggest you contact the State UST program directly on this point:

Foster Diodato
PA Department of Environmental Services
Bureau of Water Quality Management
Non-Point Source and Storage Tanks Section

12th Floor Fulton Building P.O. Box 2063
Harrisburg, PA 17165-8761
(717) 657-4080

I hope the above information is helpful to you. We appreciate and encourage your spirit of cooperation that prompted you to write your letter.

sincerely,

David Ziegele Acting Director
Office of Underground Storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

1991

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Honorable Bob McEwen
House of Representatives
Washington D.C. 20515

Dear Mr. McEwen:

Thank you for your letter of April 23, 1991, on behalf of your constituent, Mr. Bill Clausing, of Lucasville, Ohio. Mr. Clausing is apparently faced with the cost of removing and disposing of underground storage tanks from his property, which was formerly used as a gas station. The tanks have not been in use since 1976. You specifically asked whether any Federal assistance is available to assist Mr. Clausing in removing his tanks.

I am not aware of any Federal funds available through EPA to assist Mr. Clausing with the removal and disposal or his tanks. Such costs are typically borne by the tank owner or property owner, although some States have enacted assistance programs that can help their tank owners cover some of these expenses.

I cannot be certain from Mr. Clausing's letter whether his property is contaminated as a result of leaks from these tanks. In the event that it is contaminated, the State may be able to access the Environmental Protection Agency's (EPA) Leaking Underground Storage Tank (LUST) Trust Fund to assist in cleaning up the contamination. Each year, EPA awards money to States for their use in enforcement, oversight, and cleanup of releases from underground storage tanks. A State may, but is not required to, use the Trust Fund if the State determines that expenditures from the Fund are necessary to assure an effective corrective action. However, States are responsible for pursuing recovery of Trust Fund expenditures from liable tank owners. For more information about Ohio's administration of the LUST Trust Fund program, you should contact:

Ohio Department of Commerce
8895 East Main Street
Reynoldsburg, Ohio 43068
(614) 752-7938

The question of liability for tank removal at Mr. Clausing's property can be quite complex. The Federal statute -- and thus EPA's regulations -- defines the owner of a tank that was in use before November 1984 but never used after that date as any person who owned the tank immediately before the discontinuation of its use. Depending on the circumstances, it may be that Mr. Clausing would not be considered the tank owner under the Federal law.

States, however, are not constrained by the Federal definition of tank owner. They have the discretion to be more stringent than EPA in their State regulatory and enforcement efforts. Some States, for example, hold landowners as well as current and previous tank owners responsible for proper closure and removal of old tanks, as well as any contamination discovered. For more information on Ohio's position on these issues, You should contact the Ohio Department of Commerce.

I hope the information in this letter will be helpful to you in responding to your constituent, Please do not hesitate to contact me if I can be of any further assistance.

Sincerely yours,

David W. Ziegele, Acting Director
Office of Underground Storage Tanks

NOV 18 1992

Mr. David Wiley
Environmental Engineer
Office of Underground Storage Tanks
Office of Solid Waste and Emergency Response
Environmental Protection Agency
401 M Street, S.W. (OS-410WF)
Washington, D.C. 20460

Re: Temporary Closure of Underground Storage Tanks

Dear Mr. Wiley:

Our firm represents a large number of owners and operators of underground storage tanks regulated under the federal Underground Storage Tank Program set out at 40 C.F.R. Part 280. The purpose of this letter is to request written confirmation of the Environmental Protection Agency's ("EPA") position on corrosion protection upgrades for temporarily closed underground storage tanks. Based on our recent telephone discussion, it is my understanding that EPA interprets 40 C.F.R § 280.70(c), relating to upgrading requirements for temporarily closed underground storage tanks, to require corrosion protection upgrading for existing tanks only after December 22,1998. More specifically, it is my understanding that EPA interprets this provision such that an owner of an existing underground storage tank may temporarily close that tank in compliance with 40 C.F.R § 270.70(c) for a period of greater than 12 months without adding the corrosion protection specified in § 280.21 until December 22, 1998.

As we discussed, the basis of this conclusion is that Section 280.7O(c) requires tanks to either meet the performance standards for new UST systems or the upgrading requirements in Section 280.21 (for existing systems). The upgrading requirements for existing systems specified in Section 280.21, however, do not apply the corrosion protection requirements until December 1998. See 40 C.F.R. § 280.21(a).

In order to memorialize my understanding, I would request that you confirm in writing to me that existing tanks being temporarily dosed for greater than 12 months are in compliance with the corrosion protection upgrading requirements contained in section 280.70(c) if these corrosion protection upgrades. I look forward to your response. In the meantime, if you have any questions, please do not hesitate to contact me.

Very truly yours,

R. Steven Morton

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 22 1993

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. R. Steven Morton, Esquire
Brown McCarroll & Oaks Hartline
1400 Franklin Plaza
111 Congress Avenue
Austin, Texas 78701

Dear Mr. Morton:

This letter is in response to your inquiry of November 18, 1992, regarding the U.S. Environmental Protection Agency's upgrading requirements for Federally regulated underground storage tanks (USTs) that have been temporarily closed (copy enclosed). As you know, § 280.70(c) states that "when an UST system is temporarily closed for more than 12 months, owners and operators must permanently close the UST system if it does not meet either performance standards in § 280.20 for new UST systems or the upgrading requirements of § 230.21, <u>except that</u> spill and overfill equipment requirements do not have to be met."

The purpose of this letter is to communicate that the upgrading requirements of § 280.21, including specific requirements for tanks such as interior lining and/or cathodic protection, and including specific requirements for cathodic protection of piping, must be met <u>at the time temporary closure exceeds 12 months</u>.

You should be aware that UST systems temporarily closed for fewer than 12 months must meet the requirements of § 280.70(a) concerning operation and maintenance of corrosion protection and release detection, if applicable, and of § 280.70(b) concerning requirement. for vent and other lines and equipment for systems temporarily closed for 3 months or more.

I hope that this information is helpful. If you have any further questions please contact David Wiley of my staff at 703-308-8877.

Sincerely,

David Ziegele, Director,
Office of Underground Storage Tanks

Enclosure

cc: UST/LUST Regional Program Managers
UST/LUST Regional Branch Chiefs
OUST Management Team
Shelley Fudge, OUST
Bill Lienesch, OUST (compendium)
David Wiley, OUST

Financial Responsibility References

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

October 15, 1990

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Discussion of "Occurrence" and “Property Damage"

FROM: Sammy K. Ng, Chief /s/
Regulatory Analysis Branch

TO: Wayne S. Naylor, Chief
Underground Storage Tank Section, Region III

I am writing in response to your request for clarification of the terms “occurrence” and "property damage” particularly as related to Virginia's interest in these terms. Both John Heffelfinger and I have discussed the issues with Joanne Cassidy, but I wanted to provide you with something in writing for your future discussions with the State.

Occurrence.

Virginia is interested in what situations UST releases would be considered “one” occurrence versus those cases in which releases might be considered two or more occurrences. Insurance industry practice is to consider all contamination discovered during a single site investigation to be “one” occurrence, regardless of the number of tanks/piping that may be leaking. For example, if two tanks are discovered to be leaking during the same site investigation, it doesn't matter whether they are part of the same UST system, i.e., manifolded, or two separate tanks -- the insurance industry considers it to be one occurrence, with one deductible payable by the UST owner, and one cleanup conducted.

One State has chosen to define “occurrence” in their State regulations that directly reflects the insurance industry's approach, as follows:

> "Occurrence" means an incident which results in a release from an underground storage tank system, and any other releases which may be occurring simultaneously at the facility at which the UST system is located.

On the other hand, leaks discovered at different times from the same UST system, as a result of unrelated investigations would be considered “two” occurrences.

Our understanding is that Virginia wants to define leaks discovered at the same time from two separate tanks in the same excavation to be two occurrences. Under their State fund, this would require two deductibles from the tank owner, but also leave the State responsible for paying per occurrence coverage tip to the fund limits for each occurrence (an outcome the State may not desire). Although Virginia is free to make this interpretation, we believe it makes more sense to follow insurance industry practice in this case. For example, "wrap-around' insurance coverage for the deductible would likely be more available if the State considered all contamination found during a single site investigation to be one occurrence. otherwise, an insurer (or guarantor or tank owner who is self-insuring) would face great uncertainty in providing "per occurrence" coverage for the deductible.

Property Damage.

Virginia has apparently raised a question regarding the definition of "property damage." The Federal rules define the term as follows:

> "Property damage" shall have the meaning given this term by applicable state law, This term shall not include those liabilities which, consistent with standard insurance industry practices, are excluded from coverage in liabilities insurance policies for property damage. However, such exclusions for property damage shall not include corrective action associated with releases from tanks which are covered by the policy.

The State's concern is over the last sentence, which says that corrective action costs can't be excluded from property damage coverage. The confusion over this sentence lies in the fact that up until our regulations were issued, insurers did not provide any coverage for "on-site" corrective action. Coverage for bodily injury and property damage were considered third party claims. Coverage for "off-site" corrective action was provided under the property damage portion of the policy. when we wrote the FR regulations, we wanted to make sure that "on-site" corrective actions would also be covered. We assumed that such coverage would also be provided under the property damage portion of the policy and, thus, included the last sentence in the above definition.

We also wrote our regulations around the artificial distinctions of "corrective action" and "third party liability" created by Congress in the statute. The insurance industry has, for the most part, responded to these categories and now writes policies covering "corrective action" (both on-site and off-site) and "bodily injury/property damage liability." while we require corrective action coverage be obtained, we recognize that it still may occur under various portions of policy coverage. We recommend that Virginia follow the more recent industry trend of covering both on-site and off-site corrective action under the definition of corrective action.

cc: Ron Brand
Mike Williams

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. Christopher E. Mandel, Director
Risk Management Division
National Headquarters
American Red Cross
Washington, DC 20006

Re: American Red Cross compliance with 40 CFR 280 Subpart H

Dear Mr. Mandel:

I apologize for the delay in providing you with written confirmation of our phone discussion on May 10, 1991 regarding your request for a determination of whether the American Red Cross can meet the requirements of 40 CFR 280 Subpart H (Financial Responsibility requirements) through the use of the financial test of self-insurance.

As I had mentioned during our phone conversation, it is our conclusion that, based on a comprehensive review of the regulations as they now stand, the American Red Cross does not quality for the following reasons:

" As recognized in your letter (of October 4, 1990), the American Red Cross does not meet the reporting requirements of 40 CFR 280(b) (4). First, the financial statements of the American Red Cross, although publicly available, are not provided to the securities and Exchange Commission (SEC), the Energy Information Administration (EIA), or the Rural Electrification Administration (REA), as required under 40 CFR 280(b) (4) (i). The regulations require this specific reporting to ensure both that the implementing authority has ready access to current financial statements and that the financial statements are developed in a format that allows verification of compliance with the requirements of the financial test. Because the American Red Cross does not report to these agencies, the requirement that the implementation have ready access to the financial statements, if needed, is not met.

Second, as a non-profit agency, the American Red Cross is not awarded an asset size classification by Dun & Broadstreet. Under 40 CFR 280(b)(4)(ii) an asset size classification of 4A or 5A would be an acceptable substitute for submittal of financial statements to the SEC, the EIA, or the REA.

The American Red Cross's financial statements are not developed according to the Generally Accepted Accounting Principles (GAAP) that were assumed during development of the financial test of self-insurance. First, the "fund" accounting used by non-profit agencies such as the Red Cross recognizes separate funds that are legally restricted to specific purposes (e.g., the donor restricted fund). Such restrictions limit the ability to make parallels between financial statements for private corporation and non-profit agencies. Second, the accounts receivable of approximately $250 million does not appear to have been adjusted for unrecoverable amounts. We would anticipate that accounts receivable of this magnitude would contain some proportion of unrecoverable amounts, particularly if the amounts reflect nonbinding pledges rather than debts for services rendered.

Although we have not undertaken an examination of the accounting practices to identify all discrepancies between corporate financial accounting and accounting for non-profit agencies, these two differences are enough to show that the financial statements prepared by the American Red Cross do not adhere to the practices assumed by EPA when the financial test of self-insurance was developed.

For these reasons, we are unable to approve the use of the financial test of self-insurance for the American Red Cross.

As You may be aware, EPA, on August 14, l991, proposed an additional extension of the deadline for non-marketers to comply with financial responsibility requirements until December 31, 1992 (56 FR 40292). Although EPA had strong reasons for proposing the extension, promulgation is not assured. I have enclosed a copy of the, proposed rule for your information. Your comments on the proposal will be most welcome.

I hope that this letter answer your questions. If I can be of further assistance, please give me a call at (703) 308-8882.

Yours truly,

/s/

Sammy K. Ng, Acting Director
Policy and Standards Division
Office of Underground Tanks

Enclosure

cc: Lee Tyner, Office of General Counsel, EPA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

October 24, 1991

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Ms. Shirley A. DeLibero
Executive Director
NJ TRANSIT
McCarter Highway and Market Street
P.O. Box 10009
Newark, N.J. 07101

Dear Ms. DeLibero:

You have requested that EPA clarify NJ TRANSIT's classification as an underground storage tank ("UST") owner in order to determine which methods for assuring financial responsibility are available to NJ TRANSIT. You ask specifically about classification as a state or local government. In answering this question, I start from the premise that all owners and operators cf petroleum USTs must comply with the Subpart H Financial Responsibility regulations unless they are exempted under one of the express provisions of section 280.90. See 40 CFR § 280.90(a). NJ TRANSIT does not qua1ify at a state agency under 280.90(c) because the debts of NJ TRANSIT are not the debts of the State of New Jersey. You acknowledge this in your letter. Thus NJ TRANSIT must comply with the provisions of 40 CFR § 280.93.

If NJ TRANSIT is not a state agency under the UST regulations, the next question is whether it is a local government. Local government entities are required to meet the financial responsibility provision.. At the time the agency initially promulgated the financial responsibility rules it said that local government includes special purpose local entities which are generally designated as either public authorities. transit authorities, or power authorities. The Agency restated and clarified its view of what constitutes a local government in the June 18, 1990 preamble to the proposed additional mechanisms for local governments to demonstrate financial responsibility. As with the 1988 role, the preamble again mentions transit authorities as an example of special purpose local governments (55 FR 24695) and suggests that the category includes districts created by State enactment (55 FR 24696). Thus it would appear that NJ TRANSIT qualifies as a local government for the purpose of the financial responsibility regulations.

Section 280.91 sets out the schedules by which owners and/or operators of USTs must comply with the financial responsibility provisions. Assuming that NJ TRANSIT is a local government, NJ TRANSIT will be required to comply by a date one year after the promulgation of additional mechanisms for use by local government entities to comply with the financial responsibility requirements for USTs containing petroleum. 55 FR 46025 (October 31, 1990). As a local government, NJ TRANSIT would be eligible to use any of the mechanisms in the existing rules, or any new mechanisms promulgated specifically for local governments.

I hope that this letter answers your questions. If I can be of further assistance, please give me a call at 703/308-8882.

Sincerely,

/s/

Sammy K. Ng, Acting Director
Policy and Standards Division
Office of Underground Storage Tanks

cc: Lee R. Tyner

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

January 11, 1991

OFFICE OF
GENERAL COUNSEL

Craig F. Stanovich, CPCU
Vice President
BRALEY AND WELLINGTON INSURANCE AGENCY CORP.
44 Park Avenue
Worcester, MA 01609

Dear Mr. Stanovich:

I am responding to your November 27, 1990, letter to Mr. Sammy Ng regarding the financial responsibility requirements for underground storage tanks (USTs).

EPA's financial responsibility requirements for USTs are set forth at 40 CFR Part 280, subpart H (1990). Coverage for corrective action is required by 40 C.F.R. 280.93. If the owner or operator chooses insurance as the means of demonstrating financial responsibility, the policy must comply with 40 C.F.R. 280.97. Note that 40 C.F.R. 280.93(d) allows an owner or operator to use separate mechanisms or separate combinations of mechanisms to demonstrate the different categories for which assurances of financial responsibility are required.

Your letter asked whether coverage for on-site corrective action is required. As explained in the preamble to the final financial regulation, it is. 53 Fed Reg. 43322, 43348 (Oct. 26. 1988). Thus coverage limited to “the existence of imminent and substantial danger to third parties resulting from a pollution condition” would not be sufficient to provide the required corrective action coverage.

You inquired further about the meaning of the phrase “subject to the terms, conditions, limits, and limitations of liability and exclusions of the policy.” The phrase quoted above is not exactly the phrase required by the regulations. In a rule published on November 9, 1989, EPA added to the required language of both the endorsement and the certificate of insurance for insurance intended to provide evidence of financial responsibility the phrase “in accordance with and subject to the limits of liability, exclusions, conditions, and other terms of the policy.” The preamble explained that this was added "to clarify that these instruments do not narrow or broaden the scope of coverage provided in the policy itself.” 54 Fed. Reg. 47081 (November 9, 1989).

If you have further questions, I can be reached at 202/245-3710.

Sincerely,

/s/

Lee R. Tyner
Attorney
Solid Waste & Emergency
Response Division (LE-132S)

cc: Sammy Ng

March 29, 1991

<u>NOTE TO:</u> Wayne Naylor

At the same time that we were considering your request to define “corrective action,” we received a request from Region 8 that required us to tackle that issue (in addition to some others). The issue of corrective action, particularly as it relates to coverage that State funds must provide (your issue in West Virginia, I believe) is discussed in the attached response to Region 8. I hope it satisfies your needs. If not, or if you want to discuss it further, please give me a call (FTS 382-7903)

/s/

Sammy Ng

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

March 29, 1991

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Review of Wyoming Definition of “Release”

FROM: Sammy Ng, chief
Regulatory Analysis Branch

TO: Debbie Ehlert
UST Program Manager, Region 8

Maureen Doughtie of your staff recently sent us a copy of Wyoming's UST statute. she requested our opinion on the definition of "release" as it appears in Wyoming's statute, particularly as it applies to State financial assurance fund coverage and acceptability as a compliance mechanism under the Federal financial responsibility (FR) regulations. We have reviewed the definition in this Context, as well as its implications for State Program Approval stringency.

The Wyoming statue defines the term “release” as:

> “...any spilling, leaking, emitting, discharging, escaping, leaching, or disposing from an underground storage tank into groundwater, surface water or subsurface soils in amounts exceeding twenty-five (25 gallons” (emphasis added).

The question is whether Wyoming can exclude releases under 25 qallons from its regulatory program and still qualify for State Program Approval or approval of its State fund as a FR compliance mechanism. We believe that their definition may be acceptable in the context of State fund approval, but not for State Program Approval. The rationale for each of these opinions is discussed below.

State Program Approval

The Federal definition of release (Part 280.12) is identical to Wyoming's except for the 25 gallon exclusion in Wyoming’s statute. Although we established reporting triggers at the 25 gallon level for aboveground releases, Subpart E of EPA's UST regulations requires that spills or overfills of any size must be immediately contained and cleaned up, and, if not then it must be reported to the implementing agency. Thus, while reporting is not required for small spills (< 25 gallons), UST owners and operators who experience them are regulated under Subtitle I and must take appropriate action under Subpart E -- Release Reporting, investigation and confirmation.

The State Program Approval regulations and objectives do not appear to provide any relief in this case. Part 281.34 says:

> "In order to be considered no less stringent ... the state must have requirements that ensure all owners and operators conform with following:
> (a) promptly investigate all suspected releases;
> (b) Ensure that all owners and operators contain and clean up unreported spills and overfills ..."

Based on this discussion, we believe that Wyoming's definition of release would be <u>less</u> stringent than the Federal program allows.

<u>State Fund Approval for FR</u>

EPA's financial responsibility rules require UST owners or operators to demonstrate FR for taking corrective action and for third party liability. We allow States to submit their assurance funds to EPA for approval as full or partial coverage mechanisms to satisfy this requirement. The issue we face with Wyoming's definition of release is whether the State fund has to cover releases less than 25 gallons in order to be approved. Specifically, the question to be answered is whether EPA's requirement to respond to releases less than 25 gallons is defined as "corrective action."

In order to provide "corrective action" coverage, a State fund needs to cover, at a minimum, those activities required on the part of owners or operators under <u>Subpart F</u> of EPA'S UST rules. Although EPA has never formally defined the term "corrective action" in our rules, Subpart F -- Release Response and Corrective Action for UST Systems Containing Petroleum or Hazardous Substances -- is generally viewed as the "corrective action" section of the rules. This viewpoint is supported by other parts of the technical standards and preamble, which repeatedly make reference to "... begin corrective action in accordance with Subpart F." Thus, it can be argued that until an owner is forced into the subpart F section of the rules, he is not performing corrective action, <u>per se</u>.

Since the requirement to respond immediately to releases less than 25 gallons is found in <u>Subpart E</u> of the UST rules --Release

Reporting, Investigation, and Confirmation -- it can be reasonably argued that the state fund is not obligated to cover these activities, because they are not required to be performed under Subpart F. Thus, we believe that Wyoming's fund does not have to cover releases less than 25 gallons in order to be approved as an FR compliance mechanism (provided that it meets all other State fund review criteria).

Given the nature of the issue you presented and our belief that other Regions may be interested in the response, as it relates both to State Program Approval and State fund approval, we are sending copies to them for their information. If you have any questions regarding the above, or wish to discuss these issues further, please call John Heffelfinger at FTS 382-2199.

cc: UST Program Managers, Regions 1-7, 9-10
Dave Ziegele
Mike Williams
OUST Desk Officers
Jerry Parker

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

April 6, 1989

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. Christopher J. Franki
Insurance Buyers' Council, Inc
22 West Road
Baltimore, Maryland 21204

Dear Mr. Franki:

This is in response to your letter dated March 15, 1989 in which you ask for clarification of a number of issues relating to the financial responsibility requirements for petroleum underground storage tanks.

- EPA defines tangible net worth as the tangible assets that remain after deducting liabilities; such assets do not include intangibles such as goodwill and rights to patents or royalties.

" The standard definition of working capital is current assets minis current liabilities.

- Unused borrowing capacity is not considered part of the standard definition of working capital.

The non-profit community service corporation that your firm represents is considered a non-marketer. If the corporation has more that $20 million in tangible net worth then it should have complied with the financial responsibility regulation on January 24, 1989; if it has less than $20 million in tangible net worth it must comply by October 26, 1990.

The self-assurance test for local governments that Stephanie Bergman of my staff mentioned may not apply to non-profit organizations; it will be directed more towards general purpose governments (cities, counties, towns) and special purpose governments (school districts, sewer districts, power authorities, transit authorities). If the non-profit organization can meet the criteria in a self-assurance test, then it can use the mechanism to comply with the financial responsibility requirements. otherwise, there are additional mechanisms like insurance and state funds that the organization can use to comply with the requirements by October 26, 1990.

I hope this information has been helpful. If you have any additional questions, please give me a call at 202-382-7903 or Stephanie Bergman 202-382-4614.

Sincerely,

/s/

Sammy Ng , Chief
Regulatory Analysis Branch
Office of Underground Storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

April 6, 1989

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. Dean B. Ziegel
Rivkin, Radler, Dunne & Bayh
EAB Plaza
Uniondale, New York 11556

Dear Mr, Ziegel:

This letter is in response to your letter dated December 28, 1988 in which you ask for confirmation of a number of issues related to the financial responsibility requirements for petroleum underground storage tanks (USTs).

- A firm with more than $20 million in tangible net worth that does not report to the Securities and Exchange Commission, Dun & Bradstreet, Energy Information Administration or the Rural Electrification Administration must comply with the financial responsibility requirements for petroleum USTs on October 26. 1990.

- A firm "reports" to Dun & Bradstreet if:

  - the firm provides to Dun & Bradstreet information about the firms net worth or information that can be used to determine the firm's net worth; or

  - Dun & Bradstreet publishes a rating for the firm.

If you have any additional questions please call me at 202-382-7903.

Sincerely,

/s/

Sammy K. Ng, Chief
Regulatory Analysis Branch
Office of Underground Storage Tanks

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

March 28, 1991

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Release on Monies from Fully Funded Trust that is Funded with Marketable Securities

FROM: Sammy K. Ng, Chief /s/
Regulatory Analysis Branch
Office of Underground Storage Tanks

TO: Chet McLaughlin, Chief
State Program Section
Underground Storage Tank Program
EPA Region VII

This is in response to your question concerning the amount of money that is appropriate to release from a fully funded trust fund that is partially funded with marketable securities. The Federal financial responsibility regulations (Section 280.102) state that, "If the value of the trust fund is greater than the required amount of coverage, the owner or operator may submit a written request to the Director of the implementing agency for release of the excess."

Upon receipt of such a request, we suggest that in the case of a fully funded trust fund that is funded in full or in part by marketable securities, those securities should be valued at the lower of cost or market value until such time as the loss or gain is realized.

We appreciate Alma Moreno's input on this decision. If you have any additional questions or require additional clarification, please phone me at FTS 382-7903. Given the general nature of this question, I am sending a copy of this memorandum to all of the other Regional Program Managers.

cc: Dave Ziegele
Regional Program Managers I - X
Desk Officers

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VII
726 MINNESOTA AVENUE
KANSAS CITY, KANSAS 66101

April 1, 1991

MEMORANDUM

SUBJECT: Fisca Oil Co., Inc.

FROM: Alma Moreno, Environmental Engineer
Underground Storage Tanks (UST) Program, Region VII

TO: UST Regional Program Managers, Regions II - VI

Fisca oil Co., Inc. requested that the Region VII UST Program release monies in excess of $2 million held in a fully funded trust fund. At that time, we contacted each affected Region to verify that a similar request had not been submitted to each, and that Fisca Oil Co., Inc. was in compliance within that Region. Region VII coordinated this request because Fisca Oil Co., Inc. is headquartered in Region VII. Since the trust was partially funded with marketable securities, valuation became an issue.

After discussions with and the approval by the Office of Underground Storage Tanks (OUST) the criteria used to value the marketable securities was "the lower of cost or market value." Based on this criteria and the February 28, 1991 trust accounting, the Regional Administrator authorized the trustee, Commercial National Bank of Kansas City, Kansas, to refund $252,774.45 to the Grantor.

Attached is a copy of the trust agreement and certificate of financial responsibility which were reviewed and found to comply with the financial responsibility regulations. Also included is a copy of relevant correspondence and the letter sent to the trustee by the Regional Administrator and the February 28, 1991 trust accounting.

Attachments

cc: UST Regional Program Managers, Regions I, VIII, IX, X - with attachments
Sammy Ng, OUST - with attachments
Lela Hagen, OUST - with attachments