RAS 14263

APPLICANT'S EXHIBIT 49

U.S. NUCLEAR REGULATORY COMMISSION
In the Matter of ALLERGEN ENERGY CO., LLC
Docket No. 50-0219-LR Official Exhibit No. 49
OFFERED by: Applicant/Licensee Intervenor
NRC Staff Other
IDENTIFIED on 9/25/07 Witness/Panel N/A
Action Taken: ADMITTED REJECTED WITHDRAWN
Reporter/Clerk DW

Tank Inspection, Repair, Alteration, and Reconstruction

Refining Department

API STANDARD 653
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SECTION 4—INSPECTION

4.1 General

Periodic in-service inspection of tanks shall be performed by an Authorized Inspector as defined herein (see 4.10), unless otherwise noted.

4.2 Inspection Frequency Considerations

4.2.1 Several factors must be considered to determine inspection intervals for storage tanks. These include (but are not limited to) the following:

a. The nature of the product stored.
b. The results of visual maintenance checks.
c. Corrosion allowances and corrosion rates.
d. Corrosion prevention systems.
e. Conditions at previous inspections.
f. The methods and materials of construction and repair.
g. The location of tanks, such as those in isolated or high risk areas.
h. The potential risk of air or water pollution.
i. Leak detection systems.
j. Change in operating mode (for example: frequency of fill cycling, frequent grounding of floating roof support legs).
k. Jurisdictional requirements.

4.2.2 The interval between inspections of a tank (both internal and external) should be determined by its service history unless special reasons indicate that an earlier inspection must be made. A history of the service of a given tank or a tank in similar service (preferably at the same site) should be available so that complete inspections can be scheduled with a frequency commensurate with the corrosion rate of the tank. On-stream, nondestructive methods of inspection shall be considered when establishing inspection frequencies.

4.2.3 Jurisdictional regulations, in some cases, control the frequency and interval of the inspections. These regulations may include vapor loss requirements, seal condition, leakage, proper diking, and repair procedures. Knowledge of such regulations is necessary to insure compliance with scheduling and inspection requirements.

4.3 External Inspection

4.3.1 ROUTINE IN-SERVICE INSPECTIONS

4.3.1.1 The external condition of the tank shall be monitored by close visual inspection from the ground on a routine basis. This inspection may be done by owner/operator personnel, and can be done by other than inspectors described in 4.10. Personnel performing this inspection should be knowledgable of the storage facility operations, the tank, and the characteristics of the product stored.

4.3.1.2 The interval of such inspections shall be consistent with conditions at the particular site, but shall not exceed one month.

4.3.1.3 This routine in-service inspection shall include a visual inspection of the tank's exterior surface checking for: leaks; shell distortions; signs of settlement; corrosion; and condition of the foundation, paint coatings, insulation systems and appurtenances.

4.3.2 SCHEDULED INSPECTIONS

4.3.2.1 All tanks shall be given a formal visual external inspection by an inspector qualified in accordance with 4.10. at least every 5 years or at the quarter corrosion-rate life of the shell, whichever is less. Tanks may be in operation during this inspection.

4.3.2.2 Insulated tanks need to have insulation removed only to the extent necessary to determine the condition of the exterior wall of the tank or the roof.

4.3.2.3 Where exterior tank bottom corrosion is controlled by a cathodic protection system, periodic surveys of the system shall be conducted in accordance with API RP 651.

4.3.2.4 Tank grounding system components such as shunts or mechanical connections of cables shall be visually checked. Recommended practices dealing with the prevention of hydrocarbon ignition are covered by API RP 2003.

4.3.3 IN-SERVICE ULTRASONIC THICKNESS MEASUREMENTS OF THE SHELL

4.3.3.1 External, ultrasonic thickness measurements of the shell can be a means of determining a rate of uniform general corrosion while the tank is in service, and can provide an indication of the integrity of the shell. The extent of such measurements shall be determined by the owner/operator.

4.3.3.2 When used, the ultrasonic thickness measurements shall be made at intervals not to exceed the following:

a. Five years after commissioning new tanks.
b. At five year intervals for existing tanks where the corrosion rate is not known.
c. When the corrosion rate is known, the maximum interval shall be the smaller of $RCA/2N$ years (where RCA

is the remaining corrosion allowance in mils and N is the shell corrosion rate in mils per year) or 15 years.

4.3.3.3 Internal inspection of the tank shell, when the tank is out of service, can be substituted for a program of external ultrasonic thickness measurements (made on the shell while the tank is in service).

4.4 Internal Inspection

4.4.1 GENERAL

Internal inspection is primarily required to:

a. Ensure that the bottom is not severely corroded and leaking.
b. Gather the data necessary for the minimum bottom and shell thickness assessments detailed in Section 2. As applicable, these data shall also take into account external ultrasonic thickness measurements made during in-service inspections (see 4.3.3).
c. Identify and evaluate any tank bottom settlement.

4.4.2 INSPECTION INTERVALS

4.4.2.1 Intervals between internal inspections shall be determined by the corrosion rates measured during previous inspections or anticipated based on experience with tanks in similar service. Normally, bottom corrosion rates will control and the inspection interval will be governed by the measured or anticipated corrosion rates and the calculations for minimum required thickness of tank bottoms (see 2.4.7). The actual inspection interval shall be set to ensure that the bottom plate minimum thicknesses at the next inspection are not less than the values listed in Table 4-1. In no case, however, shall the internal inspection interval exceed 20 years.

4.4.2.2 When corrosion rates are not known and similar service experience is not available to determine the bottom plate minimum thickness at the next inspection, the actual bottom thickness shall be determined by inspection(s) within the next 10 years of tank operation to establish corrosion rates.

Table 4-1—Bottom Plate Minimum Thickness

Minimum Bottom Plate Thickness (see 2.4.7) at Next Inspection (inches)	Tank Bottom/Foundation Design
0.10	Tank bottom/foundation design with no means for detection and containment of a bottom leak
0.05	Tank bottom/foundation design with means to provide detection and containment of a bottom leak
0.05	Applied tank bottom reinforced lining, > 0.05 inch thick, in accordance with API RP 652.

4.4.3 ALTERNATIVE INTERNAL INSPECTION INTERVAL

For unique combinations of service, environment and construction, the owner/operator may establish the internal inspection interval using an alternative procedure. This alternative procedure shall include method for determining bottom plate thickness, consideration of environmental risk, consideration of quality of inspection and analysis of corrosion measurements. This alternative procedure shall be documented and made part of the permanent record of the tank.

4.5 Alternative to Internal Inspection to Determine Bottom Thickness

In cases where construction, size or other aspects allow external access to the tank bottom to determine bottom thickness, an external inspection in lieu of an internal inspection is allowed to meet the data requirements of Table 4-1. However, in these cases, consideration of other maintenance items may dictate internal inspection intervals. This alternative approach shall be documented and made part of the permanent record of the tank.

4.6 Preparatory Work for Internal Inspection

Specific work procedures shall be prepared and followed when conducting inspections that will assure personnel safety and health and prevent property damage in the workplace (see 1.4).

4.7 Inspection Checklists

Appendix C provides sample checklists of items for consideration when conducting in-service and out-of-service inspections (see Tables C-1 and C-2).

4.8 Records

4.8.1 GENERAL

Inspection records form the basis of a scheduled inspection/maintenance program. (It is recognized that records may not exist for older tanks and judgements must be based on experience with tanks in similar services.) The owner/operator shall maintain a complete record file consisting of three types of records, namely: construction records, inspection history, and repair/alteration history.

4.8.2 CONSTRUCTION RECORDS

Construction records may include nameplate information, drawings, specifications, construction completion report and any results of material tests and analyses.

4.8.3 INSPECTION HISTORY

The inspection history includes all measurements taken, the condition of all parts inspected, and a record of all examinations and tests. A complete description of any unusual conditions with recommendations for correction or details which caused the conditions shall also be included. This file will also contain corrosion rate and inspection interval calculations.

4.8.4 REPAIR/ALTERATION HISTORY

The repair/alteration history includes all data accumulated on a tank from the time of its construction with regard to repairs, alterations, replacements, and service changes (recorded with service conditions such as stored product temperature and pressure). These records should include the results of any experiences with coatings and linings.

4.9 Reports

4.9.1 Reports recommending repairs shall include reasons for the repairs, and sketches showing location and extent.

4.9.2 General inspection reports shall include metal thickness measurements, conditions found, repairs, any settlement measurements, and recommendations.

4.10 Inspector Qualifications

4.10.1 Qualified inspectors shall have education and experience equal to at least one of the following:

a. A degree in engineering plus 1 year of experience in inspection of tanks, pressure vessels or piping.
b. A 2-year certificate in engineering or technology from a technical college, and 2 years of experience in construction, repair, operation or inspection, of which one year must be in inspection of tanks, pressure vessels or piping.
c. The equivalent of a high school education, and 3 years of experience in construction, repair, operation or inspection, of which one year must be in inspection of tanks, pressure vessels or piping.
d. Five years of experience in the inspection of aboveground storage tanks in the petroleum or chemical industries.

4.10.2 An owner/operator of tanks may designate tank inspectors qualified in accordance with 4.10.1. Such inspectors shall have the necessary authority and organizational freedom to perform their duties. Authorized Inspectors shall be certified by an agency as provided in this standard, in accordance with Appendix D. This requirement will become effective eighteen (18) months after the date of issuance of the requirement.

4.10.3 Qualification requirements for personnel performing nondestructive examinations are identified in 10.1.1.2.