Attached is the inspection plan for the NaK tank T-2 of the Hazardous Wastes Management Facility (HWMF). As required by the operating permit of the facility, California EPA ID# CAD 000629972, October 25, 1993, measurements are to be carried out on the subject tank on a definite schedule. The present plan describes the initial tank wall thickness measurements to serve as baseline data for future inspections. If you have any questions, please let me know.

J. P. Ampaya
System Test and Chemical Processes

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Tank T-2 Inspection Plan
October 13, 1994

HWMF TANK T-2 INSPECTION PLAN

I. BACKGROUND

The Hazardous Wastes Management Facility (HWMF) located in B/133 SSFL is operated by ETEC under a California EPA permit (Ref. 1). The permit allows the facility to treat sodium and sodium-potassium (NaK) wastes by thermal oxidation and subsequent aqueous processing to yield a caustic aqueous solution. Tank T-2 is one of three tanks at the HWMF. It is used as a NaK feed tank and for short-term storage of NaK wastes. In order to assess the tank system condition the operating permit (Part III C-10e) requires that all facility tanks be inspected at a definite schedule given as follows:

1. Biennially unless otherwise specified below.

2. When the tank thickness is within 10% of the design value, the tanks shall be inspected semiannually.

3. When the tank thickness is within 3% of the design value, the tank must be replaced.

As implied in the foregoing requirements, thickness measurements are necessary to be carried out at regular intervals. The assessment is designed to address the potential for cracks or leaks, corrosion or erosion that may lead to cracks or leaks or wall thinning to less than the design thickness. No recorded wall thickness measurements are available for Tank T-2. The plan described below refers specifically to the T-2 tank inspection to provide initial wall thickness data.

II. OBJECTIVE

The objective of this plan is to measure the wall thickness of the T-2 NaK tank of the HWMF at various locations. The data will serve as a baseline and determine the schedule for future determinations in accordance with the requirements of the facility operating permit.

III. TANK T-2 DESCRIPTION

A. Tank Function and Status

A process flow and piping diagram for the eutectic NaK feed tank is shown in Figure 1. A drawing of the tank itself is found in Figure 2 (Ref. 2). Tank T-2 is used to temporarily hold waste NaK and to transfer it through a feed line into the treatment room for conversion into an aqueous solution of NaOH and KOH. At present, the tank has been isolated from the treatment...
Figure 1. NaK Waste Feed System Process Flow Diagram (Ref. 2)
Figure 2. Nak Feed Tank And Outer Containment Pan (Ref. 2)
Tank T-2 Inspection Plan
October 13, 1994

room with the plumbing removed; the tank is sealed and maintained with an argon cover gas. Except for periods of temporary storage for a few days, the tank should contain only some NaK residues.

B. Design Standards

Tank T-2 was designed and fabricated in 1967 for the SNAP-8 Program at Atomics International. The tank’s nameplate declares that the calculations and design requirements corresponded to the latest version of Section VIII of the ASME B&PV Code and resulted in the tank receiving a "U-stamp". It was manufactured by the Butane Tank Corporation and is rated at 1000°F service at 50 psig. However, the present application only requires it to contain NaK at room temperature for a maximum of 14 psig.

Secondary containment is provided for this tank by a 84" x 48" x 24" high carbon steel catch tank.

C. Tank Features

1. Design Specifications
   a. Horizontal tank, 36-inch diameter by 60-inch straight
   b. Location: Outdoor
   c. Capacity: 270 gallons operating
   d. Shell: 1/4-inch thick; Heads, 3/16-inch thick
   e. Pressure Rating: 50 psig
   f. Design Temperature: 1000°F
   g. Structural Supports: integral saddles
   h. Age of Tank: 1967

2. Tank Construction Material: 304 SS

3. Lining Material: None

4. Corrosion Resistance
Tank T-2 Inspection Plan
October 13, 1994

Tank T-2 rests on a 4 inch asphalt base and does not contact the soil or ground water.

Corrosion resistance of 304 SS to NaK is rated as "good", which corresponds to a rate of attack less than 1 mil/yr (Ref. 3).

IV. MEASUREMENTS

Wall thickness measurements to 0.001" at various points designated in Figure 3 will be conducted by an ultrasonic method. The inspection will be conducted by the ETEC Quality Assurance group through an Engineering Work Request.

V. DOCUMENTATION

The data will be recorded, certified by QA, and reported by the QA engineer. The original report will be part of a permanent file on tank inspections to be maintained by the PIC at B/133.

REFERENCES:


Figure 3. Tank T-2 Wall Thickness Measurement Designated Points