APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 30-17243/90-01 License: 42-01485-04

Docket: 30-17243

Licensee: TN Technologies, Inc.
P.O. Box 800
Round Rock, Texas 78680-0800

Inspection At: Kerr McGee Refinery
Wynnewood, Oklahoma

Inspector: Charles L. Cain 6/12/90
Charles L. Cain, Chief, Nuclear Materials Inspection Section Date

Accompanied By: Wesley L. Holley, Radiation Specialist
Nuclear Materials Inspection Section

Jack E. Whitten, Senior Health Physicist
Nuclear Materials Licensing Section

Inspection Summary

Inspection Conducted May 22, 1990 (Report 30-17243/90-01)

Areas Inspected: This was a special, unannounced radiation safety inspection of activities associated with the installation and calibration of fixed nuclear gauges for a customer specifically licensed by NRC for possession and use of the devices. The gauges were installed by TN Technologies at the Kerr McGee Refinery, Wynnewood, Oklahoma. The Kerr McGee refinery was issued NRC Byproduct Materials License No. 35-12636-10 on November 27, 1989.

The inspection included a review of the licensee's preparation for gauge installation, the installation of the gauges onto refinery hardware, and the preparation of the gauges for use.

Results: No violations of NRC requirements were identified.

DETAILS

1. Persons Contacted

TN Technologies, Inc.

Tamim Farouk, Field Service Representative
*William G. Hendrick, Director, Environmental Services

Kerr McGee Corporation

Maybelle Landagora, Regulatory Affairs Office representative
Patrick M. Sullivan, Refinery Radiation Safety Officer (RSO)

*Contacted telephonically for exit briefing only

2. Preparation for Installation

The inspectors arrived at the refinery at about 8:00 a.m. and were granted access clearance to the site at about the same time as the TN Technologies field service representative. The group that assembled for the site tour and inspection activities included the RSO, the Regulatory Affairs Office representative, the TN Technologies field service representative, in addition to the three NRC inspectors.

The RSO led the group on a tour of the installation site which consisted of nearly complete construction of an addition to the refinery. The structure was approximately 150 feet high, and the RSO stated that it would be used to produce high octane fuels. The construction contractor on the site was identified as Howe-Baker Engineering, Inc., and a relatively large number of workers were engaged in welding and other mechanical work on the structure.

During the tour, the RSO pointed out the five gauge detectors that had been installed on various process vessels. The inspectors also observed flanges on these vessels, opposite to the detectors, which were to be used to mount the gauge source heads containing the licensed sealed sources of cesium-137.

Following the site tour, the group went to a storage building where the uncrated source head assemblies were located. Each of the three crates displayed DOT Yellow II labels that indicated the following cesium-137 sources in each:

Crate 1: one 50 mCi and one 20 mCi source
Crate 2: one 100 mCi and one 20 mCi source
Crate 3: one 500 mCi and one 20 mCi source

Although there were six sources, there was to be only five gauges. One of the gauges was a continuous level gauge that was to use two source heads with each containing a 20 mCi source.

The maximum surface exposure rate of 7 mR/h was measured on Crate 3. The three crates were of equal size and consisted of double thickness cardboard boxes mounted on wooden pallets. Later, when the crates were opened, the inspectors found that the boxes were foam-filled and that the source heads were bolted to the pallets. Each crate was labeled as a DOT Specification 7A package.

3. Gauge Installation

The three crates were transported to the nearby construction site in a pickup truck. After the crates were unloaded, the cardboard portion of the crates were cut away with a knife and the source heads were unbolted from the pallets. The source heads were each found to be appropriately labeled and to have padlocks installed on the shutters which were in the "off" position.

The NRC inspectors and the field service representative made instrument surveys of the exposure rates on the surfaces of the source heads. The licensee's survey instrument, a thin end window GM, was found to have a sticker indicating recent calibration. The representative used a check source to check instrument operability. Rates measured with the licensee's instrument and NRC instruments compared reasonably. Contact readings on the source heads ranged from 25 to 60 mR/h.

Several of the source heads were lifted by 1/4 ton hoists to the upper levels of the refinery structure. The smaller ones were hand carried up the stairways. Howe-Baker Engineering personnel used the hardware that came with source heads to bolt them to the vessel flanges.

4. Preparation of Gauges for Use

Upon completion of source head mounting, the inspectors accompanied the field service representative during power up and calibration of two of the gauges. (Similar work for the remaining gauges was not completed until the following day, after the inspectors departed. The field service representative also was to provide some training to the RSO on the third day.)

The field service representative performed a leak test on the first source head with a cotton swab and performed a field evaluation of this specimen using the thin end window GM. A 0.0045 uCi Cs-137 check source was used to confirm that the specimen reading was below the regulatory limit for leakage. The performance of this test also served to train the RSO on the mechanics of conducting future tests.

The remainder of the gauge preparation consisted of detector adjustments, attenuatior plate selection, and on/off shutter testing with control room

readouts relayed by portable radio transceiver. Various attenuation plates came mounted to the source head, and a proper combination was installed. Radiation surveys were made at various points on the entire assembly, and the results were recorded on a log sheet.

The inspectors asked to see the dosimeter worn by the field service representative, and he presented a wallet card dosimeter carried in his hip pocket.

5. Exit Briefing

At the conclusion of the inspection on May 22, 1990, the inspector informed the field service representative that no violations of NRC requirements had been identified. This report was also presented telephonically to the licensee's Director, Environmental Services, on June 7, 1990.