

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

INSPECTION REPORT

Inspection No. 03035689/2009001  
Docket No. 03035689  
License No. 45-25554-01  
Licensee: Construction Testing and Engineering, Inc.  
Location: 9111-A Industrial Drive  
Manassas, VA 20110  
4424 Old Columbia Pike  
Annandale, VA 22003  
Inspection Dates: January 23, 2009 – March 26, 2009

Inspectors:     /RA/         03/30/09      
Michael Reichard date  
Health Physicist

Approved By:                     /RA/                         03/30/09      
Marie Miller, Chief date  
Materials Security and Industrial Branch  
Division of Nuclear Materials Safety

## EXECUTIVE SUMMARY

Construction Testing and Engineering, Inc.  
NRC Inspection Report No. 03035689/2009001

An announced, reactive inspection was performed on January 23, 2009, following the licensee's notification (Event Notification Number 44796) on January 22, 2009. A Troxler portable nuclear density gauge, licensed for 40 milliCuries (mCi) of americium-241 (Am-241) and 8 mCi of cesium-137 (Cs-137), was badly damaged at the Pine Crest construction site in Fairfax County, Virginia. The licensee also reported that the Cs-137 sealed source had been separated from the device.

The event began when a Smooth Drum Roller damaged the portable gauge. After informing site personnel of the event and working with the project manager to secure the impacted area, the authorized user contacted his Radiation Safety Officer (RSO), Troxler, and emergency responders. Emergency responders, including the Fairfax County Hazmat Team responded to the event within 15 minutes of being notified. While the licensee was present at the scene, the Fairfax County Hazmat Team performed most of response actions after they arrived. The Fairfax County Hazmat Team remained in consultation with Troxler during the response. Initially, the Hazmat Team determined that the sources appeared to present within the device and appropriately shielded. However, when the Hazmat Team moved the damaged gauge to prepare it for transportation, radiation levels increased, which indicated that the Cs-137 source had become disconnected from the device and its shielding. Later in the afternoon, notifications were made to the Commonwealth of Virginia Department of Health by the RSO; and to the NRC Headquarters Operations Center. With the support of the Virginia Department of Health, the Fairfax County Hazmat Team obtained a shielded container for the source and placed the sealed source within it. The damaged gauge and the shielded source were placed within the Troxler transportation case for transportation to the licensee's facility. The Fairfax County Hazmat Team and the Virginia Department of Health representatives surveyed the event area and found that radiation levels were indistinguishable from background. The device was transported to the licensee's storage location and secured.

On January 23, 2009, a Nuclear Regulatory Commission Region I inspector began an inspection of the licensee's storage facility and at the construction site where the event occurred. The inspector observed and surveyed the storage area where the damaged device was stored. The inspector interviewed licensee personnel and other involved individuals to establish an understanding of the event and the response. The inspector observed a reenactment of the event at the Pine Crest construction site. The inspector reviewed applicable documentation. The inspector observed a Troxler technician repackaging the device, taking leak test wipes of the sources and damaged device, and taking possession of the device. After January 23, 2009, the inspector contacted licensee personnel and other individuals involved to obtain clarifying information. On January 26, 2009, Troxler completed its leak test analysis and determined that both sources had remained intact during the event and neither was found to be leaking. On February 19, 2009, the licensee received a radiation exposure report from Troxler indicating that the gauge user's exposure was below the minimum detection level. The licensee submitted the required thirty day written report.

Within the scope of this inspection, no violations of NRC regulations were identified.

## **REPORT DETAILS**

### **I. Event Description**

#### a. Inspection Scope

This inspection was limited to a review of the circumstances surrounding an event involving a nuclear density gauge containing licensed material that was damaged on January 22, 2009. The inspection consisted of observations by the inspector, interviews with licensee personnel, a reenactment of the event, and a selective examination of records describing the event and follow-up actions.

#### b. Observations and Findings

##### Event Details

On January 22, 2009, at 10:25 AM, a Troxler Nuclear Density Gauge, Model 3440 was involved in a construction accident at 4424 Old Columbia Road, Annandale, VA. The authorized user was standing within five feet of the gauge, approximately three feet from the fence line. A Smooth Drum Roller was operating in an empty, man-made pond that was being constructed. The portable gauge was being used to check the compaction being done by the Smooth Drum Roller. During one pass of the Smooth Drum Roller, the machine crested the pond's bank, which was approximately fifteen feet deep, and quickly rolled back towards the portable gauge. The authorized user safety got out of the way, but the gauge was severely damaged.

The construction site project manager witnessed the event and ran to the event location. The authorized user and the project manager alerted the remaining staff of the event and ordered them to stay away from the event location. There were five employees on site, including the authorizer user and the project manager.

The authorized user went to his car, which was parked on the other side of the pond, to obtain his emergency contact information. Due to noise, the gauge user went into a trailer to make his emergency contacts. He contacted the licensee's Radiation Safety Officer (RSO), 911, and Troxler. He also contacted a representative from the former owner of the gauge, because that emergency contact information was still kept with the transportation documentation. (This information was removed as part of the licensee's corrective actions.) At approximately 11:00 AM, emergency responders arrived, including the police, fire rescue, and the Fairfax County Hazmat Team (FCHT). The licensee possesses radiation detection equipment at their storage location. However, the FCHT arrived with radiation detection equipment, so the licensee allowed them to conduct radiation surveys, and didn't bring its equipment to the event location. The FCHT took measurements around the event location and found that radiation levels were within expected levels near an intact gauge. The police department took pictures of the event scene and emailed them to Troxler via their cell phones.

At approximately 1:00 PM, based on discussion with Troxler, the FCHT began moving the gauge pieces into the gauge's transportation case. At this point the FCHT found that the radiation levels increased near the event location. The FCHT determined that the

Cs-137 source had separated from the device, but had been resting under the gauge's shielding. The Am-241 source remained in the device. The FCHT contacted the Commonwealth of Virginia Department of Health, Radioactive Materials Program Director and the NRC to solicit assistance in response to this event. The Virginia Program Director also contacted NRC Region I for event coordination. NRC regional staff contacted the licensee's RSO and spoke with the police representative, who had assumed command and control of the event scene.

At 4:50 PM, the licensee contacted the NRC to make the required formal event notification as required by 10 CFR 30.50(b)(2). NRC personnel remained in contact with the licensee and emergency responders during the remainder of the event. Virginia Radioactive Materials Program Director and a member of his staff responded to the event location and brought additional radiation detector equipment and shielding.

At approximately 8:30 PM, the FCHT placed the source in a lead shielded container. The FDHT confirmed that there was no measureable radiation near the event site. With concurrence from Troxler, the FCHT, and Commonwealth of Virginia Department of Health, the licensee transferred the material to its storage location.

At approximately 10:00 PM, the material was secured at the licensee's storage location.

On January 23, 2009, an inspector from the Nuclear Regulatory Commission performed an inspection of the event and follow-up actions. The inspector observed and surveyed the material in the storage location. All measurements were within acceptable limits and the inspector found that the material was properly secured. The inspector went to the event location and the authorizer user and project manager performed a reenactment of the event. The inspector interviewed the site project manager, the gauge user, and the Radiation Safety Officer regarding the event.

Based on the reenactment of the event and the statements made by the authorizer user and the project manager, the inspector determined that the authorizer user was within five feet of the gauge. However, due to the rapid and unexpected movement of the Smooth Drum Roller towards the gauge, the authorizer user was compelled to protect his personal safety and could not attempt to retrieve the gauge. The inspector found that the gauge user acted appropriately and the authorizer user maintained reasonable control and surveillance of the gauge.

At approximately 5:00 PM, the inspector observed a Troxler employee repackaging the source and gauge. The Troxler employee took leak test wipes and committed to a short turnaround time on the leak test results. The Troxler employee shipped all of the gauge parts, the sealed sources, within the gauge transportation case.

#### Notification of the Event

The licensee notified the Nuclear Regulatory Commission of the event at 04:50 PM on January 22, 2009, approximately 6.5 hours after the event. This met the 24-hour reporting requirements of 10 CFR 30.50(b)(2), which requires in part, that each licensee shall notify the NRC within 24 hours after the discovery of any event involving licensed material, in which equipment is disabled or fails to function as designed when the

equipment is required to prevent exposures to radiation and radioactive materials exceeding regulatory limits.

10 CFR 30.50 (a) requires, in part, that each licensee shall notify the NRC as soon as possible but not later than 4 hours after the discovery of an event that prevents immediate protective actions necessary to avoid exposures to radiation or radioactive materials that could exceed regulatory limits or releases of licensed material that could exceed regulatory limits. This event did not prevent immediate protective actions. Protective actions were made to ensure that exposures were kept below regulatory limits. Therefore, an immediate report was not required.

The licensee submitted a 30 day report, dated February 16, 2009, which was made available to the NRC Region I office on March 11, 2009. This met the requirements of 10 CFR 30.50 (c)(2), which requires, in part, that each licensee who makes a report required by paragraphs (a) or (b) of 10 CFR 30.50 shall submit a follow-up report within 30 days of the initial report. However, the NRC Region I office requested a revised 30-day report from the licensee including greater detail of the event and the dosimetry exposure results, once they were available. The licensee submitted a revised 30 day report on March 25, 2009.

#### Follow Up Actions

The licensee informed the inspector, as additional information related to the event was received. Troxler provided a leak test certificate to the licensee on January 26, 2009, confirming that both sealed sources were intact. The licensee received a radiation exposure report from Troxler, dated February 19, 2009, indicating that the exposure measured on the authorized user's dosimeter was below the MDL.

The emergency notification procedure referenced the previous owner of the gauge. This reference confused the authorizer user. However, the correct NRC or Agreement State notification information, listed by state, was available and the NRC was notified within the required interval. The licensee generated a new emergency notification procedure that clarified next actions and correctly referenced the licensee's contact information. This emergency procedure was added to the transportation documentation of each gauge and the old emergency procedures were destroyed.

#### c. Conclusions

The licensee's actions met applicable requirements. The gauge user acted appropriately and the authorizer user maintained reasonable control and surveillance of the gauge. The NRC was notified within the required 24 hours. However, the licensee recognizes that their emergency procedures were unclear with respect to NRC or Agreement State notification, and made appropriate changes to improve communications with the regulatory response agencies.

No violations were identified as a result of the inspection.

## II. Exit Meeting

A preliminary exit meeting was conducted on January 23, 2009 to discuss the scope of the inspection and the inspector's initial observations. On March 26, 2009, at the conclusion of the inspection, an exit meeting was held by telephone to discuss the inspector's final observations.

### **PARTIAL LIST OF PERSONS CONTACTED**

#### Licensee

Hassan Tajick, Radiation Safety Officer \*+  
Johnny Kwan, Gauge User

#### Other

Mr. Kelly, Project Manager of the Pike Crest construction site  
Cpt. Allen Richardson, Fairfax County Hazmat Team  
Michael Welling, Commonwealth of Virginia, Department of Health  
Sahid Thomas, Troxler Electronic Laboratories

\* Present at entrance meeting

+ Participated in telephonic exit meeting conducted on March 26, 2009