

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket: 030-17304

License: 34-18882-01

Report: 030-17304/96001(DNMS)

Licensee: H. C. Nutting Company

Facility: Columbus, Ohio field office

Location: 790 Morrison Road  
Columbus, Ohio

Dates of Inspection: November 6 and 7 (on site) with continuing in  
office review through November 18, 1996

Inspectors: Deborah A. Piskura, Radiation Specialist  
Darrel G. Wiedeman, Senior Radiation Specialist

Approved: John R. Madera, Chief  
Nuclear Materials Inspection Branch 1

Attachments: A: List of persons contacted and list of Acronyms  
used;  
B: Licensee's 30 day report  
C: Analysis of leak test

## EXECUTIVE SUMMARY

H. C. Nutting Company  
Cincinnati, Ohio  
NRC Inspection Report 030-17304/96001(DNMS)

On August 7, 1996, a vehicle which had a moisture/density gauge secured inside was stolen. The gauge contained sealed sources of 8 millicuries and 40 millicuries of cesium-137 and americium-241 respectively. The vehicle was locked and the transport case was locked and concealed under a draw cover in the back of the vehicle. The vehicle belonged to an authorized gauge user and was parked during off-hours at his apartment. During the night, an unknown individual(s) smashed the driver's window and stole the truck. Upon discovery of the vehicle theft early that morning, the gauge user immediately notified the Cincinnati office of the theft. The local police and news media were also notified of the theft. On August 9, 1996, the State Highway Patrol located the stolen vehicle in Columbus, Ohio. The vehicle and gauge were returned to the licensee on August 10, 1996. The gauge was locked within the truck and undamaged. The inspectors' review of this incident and the licensee's 30 day report did not identify any violations of NRC requirements.

On October 15, 1996, a licensee gauge operator left a Troxler moisture/density gauge unattended at a temporary job site. The operator placed the device on the ground and walked 20 feet away to speak to a construction foreman who was driving an earth grader. At the conclusion of their conversation, the foreman drove on, turning towards the gauge and ran over it. The gauge housing was cracked and a portion of the "source control rod" broken, however the sources remained intact and shielded within the device. The licensee reported the incident to Region III on October 17, 1996.

The licensee surveyed the area and the device and found no unusual radiation levels. The licensee recovered the damaged gauge from the job site and transported it back to the Columbus, Ohio field office. The licensee performed a leak test on the gauge and placed the unit in storage. The damaged gauge will be packaged and transferred to the manufacturer for repair and/or disposal at a later date.

Two NRC inspectors reviewed the two incidents on November 6-7, 1996, to evaluate any radiological consequences surrounding the events, the damaged gauge recovery operations, and the licensee's corrective actions.

### Regulatory Issue

Based on the findings of the inspection, a violation of 10 CFR 20.1802 was identified for failure to control and maintain constant surveillance of licensed material that is in an unrestricted area. Specifically, the licensee left a moisture/density gauge unattended at a temporary job site and the unit was subsequently run over and damaged by an earth grader. (Violation 030-17304/96001(DNMS)).

## Details

### 1. Program Overview

#### Facility Description

H. C. Nutting Company possesses approximately 50 moisture/density gauges, each containing nominally 8 millicuries (300 MBq) of cesium-137 and 40 millicuries (1480 MBq) of americium-241 as sealed sources. The gauging devices are used daily during the "construction season" (March through October) for measuring properties of asphalt and construction materials.

#### Gauge Program

License No. 34-13882-01 was renewed on January 11, 1996, and will expire on January 31, 2006. The license authorizes storage of licensed material at its main office located in Cincinnati, Ohio and at two field offices located in Blacklick (Columbus), Ohio and Charleston, West Virginia. Gauging devices are authorized for use at temporary job sites, anywhere the NRC maintains jurisdiction.

### 2. Damaged moisture/density gauge

#### Inspection Scope (IP 87100, 83822, 83726, and 87103)

The inspectors interviewed the gauge user, Radiation Safety Officer (RSO) and the office manager of the licensee's field office in Columbus, Ohio. Leak tests were performed on the damaged gauge and independent radiation measurements were made. The inspectors also reviewed the licensee's initial and periodic training program for gauge users.

#### Observations and Findings

##### Damaged Gauge Incident

The NRC inspectors interviewed the gauge user involved in the damaged gauge incident that occurred on October 15, 1996. The gauge user stated that at approximately 11:45 a.m. on October 15, 1996, he was using a Troxler Model 3411B (serial number 17761) moisture/density gauge, at a temporary job site in East Liberty, Ohio. After he completed several measurements with the gauge he walked away from the gauge to talk to the construction foreman to discuss the results of the tests. After the discussions of the test results were finished, the foreman who was driving an earth grader proceeded to drive forward. The gauge was run over by the earth grader and damaged. The operator of the gauge was about 20 feet from the device at the time of impact, and was not injured. The device contained a nominal 8 millicurie (300 MBq) cesium-137 and 40 millicurie (1480 MBq) americium-241 special form sources. The weight of the earth

grader broke a portion of the cesium-137 source control rod and crushed the instrument's control panel.

The gauge user stated that he telephoned the licensee's Columbus field office. The site RSO responded about an hour later and brought a portable radiation survey meter with him. The site RSO indicated that he performed direct radiation surveys of the device and no unusual radiation levels were identified. The device was transported by the licensee back to their Columbus field office and placed it in a locked, secure storage area. At the field office the licensee performed a leak test on the sealed sources and sent the sample to a licensed leak test service for analysis. The corporate RSO stated that they intend to return the damaged device to the manufacturer for replacement and/or repair after they receive the leak test results.

#### Training Program

The gauge user involved in the event successfully completed an authorized user training program for gauge users in July 1996, and had previous experience in the use of the devices. The operator was familiar with the licensee's utilization procedures which required, in part, that gauges are never to be left unattended while in use at field sites. The authorized gauge user did not maintain constant surveillance of the gauge while performing tests at the job site on October 15, 1996. The error appears due to carelessness on part of the gauge user based on an interview with the individual. According to the licensee's RSO, gauge users are instructed to not leave a gauge unattended.

#### Conclusions

10 CFR 20.1802 requires that a licensee control and maintain constant surveillance of licensed material that is in a controlled or an unrestricted area and that is not in storage. As defined in 10 CFR 20.1003, unrestricted area means an area, access to which is neither limited nor controlled by the licensee.

As described above, the gauge operator stood about 20 feet from the device with his back toward it, while he spoke to the construction foreman. After their conversation, the foreman proceeded to drive forward and drove over the portable gauge. During this event, the gauge user did not have enough time to retrieve the device or signal the foreman to stop.

Failure to control and maintain constant surveillance of licensed material that is in an unrestricted area and that is not in storage is an apparent violation of 10 CFR 20.1802.

### 3. Recovery Activities

The licensee's Columbus office RSO (site RSO) arrived at the construction site about 12:45 p.m. on October 15, 1996. The site RSO conducted direct radiation

surveys of the device and identified no unexpected radiation levels. The licensee visually inspected the gauge and observed no problems other than the broken source control rod and the distorted instrument panel. The site RSO placed the damaged gauge in its Type A shipping container and transported the device back to the Columbus field office. Preliminary leak tests for gross removable contamination were performed and revealed no gross source leakage. Upon arrival at the field office, the licensee placed the damaged gauge within its shipping container in secure storage. The licensee notified all of its authorized users not to use the damaged gauge on the sign out sheet/utilization log.

#### 4. Independent Radiation Measurements

##### Inspection Scope (IP 87100, 83822, 83726, and 87103)

The inspectors performed independent radiation measurements with a Ludlum Model 3 portable survey instrument, Serial No. 109308, calibrated on January 2, 1996. The inspectors performed a leak test of the damaged gauge.

##### Observations and Findings

Radiation surveys performed during the tour of the licensee's gauge storage area revealed no radiation levels above natural background. The NRC inspectors examined the damaged gauge and noted the condition of the source control rod and the instrument panel. Direct radiation measurements of the damaged gauge within its plastic transport case showed a maximum level of 12 milliroentgens/hour {mR/hr} (3100 nC/kg/hr) on the surface (left side). This measurement is in agreement with the radiation profile of the device as describe in the manufacturer's sealed source and device registry sheet. After the gauge was removed from its shipping container, the inspectors performed a "field" source leakage test and did not identify any gross removable contamination. Further analysis of the leak test sample in the Region III Laboratory confirmed that no removable contamination was identified.

#### 5. Regulatory Issues (Reports)

In accordance with 10 CFR 20.2201, the licensee made an immediate report of the stolen gauge to the NRC within the specified time frame and a written report within the 30 day reporting period for the stolen gauge (See Attachment b). The licensee also reported the damaged gauge incident, followed by a written report.

##### Exit Meeting Summary

The inspection findings as noted in this report were discussed with the licensee during an exit meeting on November 7, 1996. The meeting included a discussion of the apparent violation, the NRC Enforcement Policy and the licensee's preliminary corrective actions. Inspection findings were also discussed with Mr. Scott during a telephone conference on November 18, 1996.

The licensee did not identify any information reviewed during the inspection as proprietary.

## ATTACHMENT A

### LIST OF PERSONS CONTACTED

Jack Scott, President and CEO  
Walter W. Becker, Corporate Radiation Safety Officer  
Greg Butcher, P.E., Columbus Operations Manager  
John Enderle, Branch RSO  
Alexander Dettloff, Staff Engineer

### INSPECTION PROCEDURES USED

IP 87100: Appendix E, Industrial Inspection Field Notes  
IP 87103: Inspection of Incidents at Nuclear Materials Facilities  
IP 83822: Radiation Protection  
IP 83726: Control of Radioactive Material, Contamination, Surveys and Monitoring

### ITEMS OPENED

030-17304/96001(DNMS) VIO Failure to control and maintain constant surveillance of licensed material that is in an unrestricted area and that is not in storage.

### LIST OF ACRONYMS USED

Am-241	americium-241
Cs-137	cesium-137
GBq	gigabequerel
IP	Inspection Procedure
mCi	millicurie
mR	milliroentgen
NRC	Nuclear Regulatory Commission
RSO	Radiation Safety Officer



# H. C. NUTTING COMPANY

EMPLOYEE OWNED

GEOTECHNICAL, ENVIRONMENTAL AND TESTING ENGINEERS  
SINCE 1921

CORPORATE CENTER  
4120 AIRPORT ROAD  
CINCINNATI, OHIO 45226  
(513) 321-5816  
FAX (513) 321-0294

August 14, 1996

W.O.# 99999.915 slm

ATTACHMENT B

Ms. Troy Simmons  
U. S. Regulatory Commission  
Region III  
801 Warrenville Road  
Leslie, IL 60532-4351



**RE: Theft of Model 3411B Nuclear Density Gage  
Serial No. 16093  
Owner - H. C. Nutting Company  
Cincinnati, Ohio  
License No. 34-18882-01  
Docket No. 03-17304**

Dear Ms.

In accordance with the requirements of the NRC regulations and confirming our telephone conversations of August 7th, and 8th, 1996, regarding the theft and recovery of the referenced nuclear density gage.

Sometime between 12:00 p.m. Tuesday, August 6, 1996, and 7:00 a.m. Wednesday, August 7, 1996, a 1992 Jeep Cherokee Laredo belonging to one of our field representatives, Mr. Chris Shewmaker, was stolen from the Madison Apartments located at 2341 Madison Road, Cincinnati, Ohio.

As indicated, the vehicle belonged to one of our soils technicians whose daily operations involve the use of the nuclear density gage at a project located in the greater Cincinnati area. The gage in question was secured in the vehicle's concealed luggage compartment. Both the gage and its shipping box were locked as per our standard practice. It appears that the unknown party gained entrance to the vehicle by simply smashing out the drivers side window.

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Upon discovery of the missing vehicle, our technician notified our office immediately and then notified the local authorities concerning the theft of the vehicle in question as well as the presence of the nuclear device contained in the vehicle.

The writer was notified of the theft at approximately 7:15 a.m. whereupon he went to the Madison Apartments and met with the technician involved. After obtaining a brief history of the incident, he proceeded to District #2 Police Station. At the station, he briefed the officer's involved in the investigation regarding the nature of the radioactive gage.

The local law enforcement agency notified all surrounding enforcement agencies as well as the State Highway Patrol concerning the theft of the vehicle. In addition, we contacted the local television and radio stations concerning a public announcement regarding the theft. The announcements were made throughout the day as well as the 6:00 p.m. news on all local television stations.

In regards to recovery, our technician received a call from the State Highway Patrol that they had recovered the vehicle in question. They recovered the vehicle in a suburb of Columbus, Ohio. This notification was received on Wednesday, August 9, 1996, at approximately 12:30 a.m. The technician then notified our office the following morning at which time we contacted the law enforcement agency in question regarding the condition of the nuclear meter and its shipping container. We were advised that the units appeared to be undamaged and all locks were in tact. This condition was confirmed by our Columbus, Ohio division.

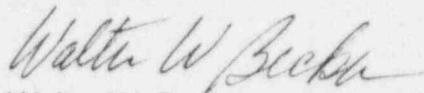
On Friday, August 10, 1996, the police released the gage into our custody. The instrument in question was picked up by our Columbus facility and returned to our Cincinnati division on Sunday, August 11, 1996.

As indicated, when the vehicle and meter were recovered the units were kept in the possession of the police authority while the investigation was being completed and upon completion of their initial investigation they released the gage to our Columbus, Ohio office.

If you should have any questions and/or require additional information on the context of this letter or the sequence of events, please feel free to contact the writer.

Sincerely,

**H. C. NUTTING COMPANY**

A handwritten signature in cursive script, reading "Walter W. Becker".

Walter W. Becker  
Radiation Safety Officer



# H. C. NUTTING COMPANY

EMPLOYEE OWNED

GEOTECHNICAL, ENVIRONMENTAL AND TESTING ENGINEERS  
SINCE 1921

November 6, 1996

CORPORATE CENTER  
4120 AIRPORT ROAD  
CINCINNATI, OHIO 45226  
(513) 321-5816  
FAX (513) 321-0294

Mr. Michael LaFranzo  
US Nuclear Regulatory Commission  
Region 3  
801 Warrenville Road  
Leslie, Illinois 60532-4351

Re: Troxler Model 3411B Nuclear  
Density Gauge, Serial #17761  
NRC License #34-18882-01  
Document Control #03-17304

Dear Sir:

This correspondence is in accordance with NRC requirements and confirms our telephone conversations of October 11, 1996, regarding the accidental damaging of the referenced nuclear density gauge. As previously discussed, the accident occurred on October 11, 1996, at approximately 11:45 a.m. at a project site located in East Liberty, Ohio. The project (NEX Transportation Facilities) is located at 13000 State Route 33, East Liberty, Ohio.

The accident occurred when a piece of rubber-tired construction equipment (road grader) struck the gauge. It is my understanding, prior to the accident, our technician had finished a field density test and was to inform the operator of the test results. To do so, he left the meter in place and walked to the right side of the unit to discuss the test results with the operator. Upon completion of the discussion, the operator resumed grading operations. When he turned to the left, he struck and damaged the gauge. A diagram of the accident scene is attached.

Following the accident, the instrument and the affected area was isolated, after which our field technician notified our Columbus, Ohio, office. Upon receipt of the notification, our Columbus advisor, Mr. John F. Enderle, was dispatched to the project to supervise the recovery of the instrument. This examination revealed the damage had been limited to the face of the gauge, breaking the

index rod, and a slight bending of the source rod. With the source rod in a stored position, a radiation survey of the instrument revealed radiation levels in the range of two to three MR.


Upon completion of the gauge survey, the gauge was returned to the shipping container, after which the soil surface at the point of the accident was checked for radiation contamination. This survey revealed the soils were free of radiation contamination. Following the survey of the gauge and the soil, the gauge was returned to our Columbus facility where it was again surveyed and leak tested. The survey readings were normal, and the gauge was placed in our designated storage room. We have not received results of the leak test to date.

In regard to the repair or replacement of the instrument, following Troxler's instructions, the damaged instrument will be returned to their facilities for repair or replacement.

As previously indicated, the accident was the result of our technician's failure to keep immediate control of the gauge. In an effort to eliminate this type of accident, each division will hold a safety meeting for the sole purpose of re-familiarizing all field technicians regarding the direct control of surveillance and proper storage of nuclear gauges on field projects. These retraining classes will be completed within 45 days of the date of this letter.

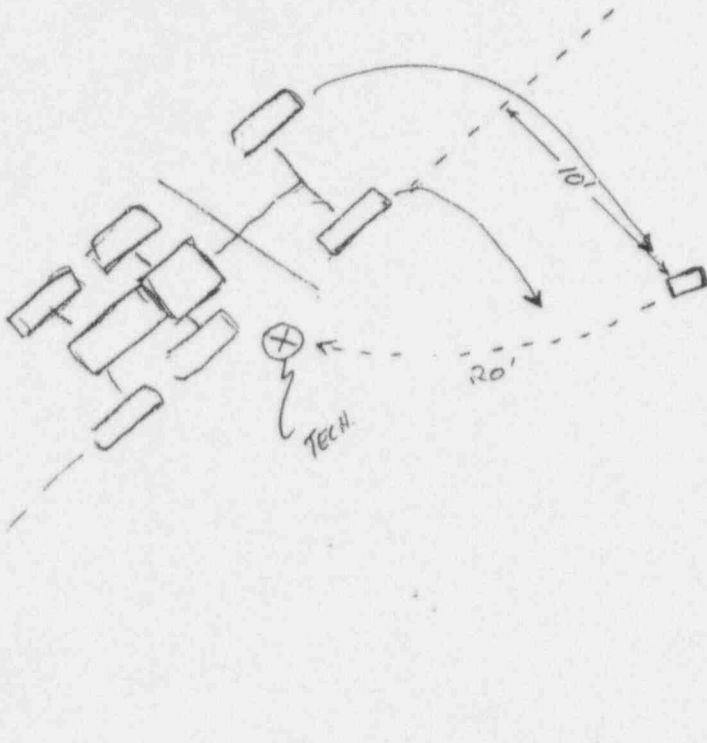
In closing, if you should have any questions or require this information on how we are handling this incident or the contents of this correspondence, please contact the writer at (513) 321-5816, Ext. 307.

Respectfully submitted,  
**H. C. NUTTING COMPANY**

  
Walter W. Becker  
Radiation Safety Officer

WWB/ks

PLAY NORTH





# H. C. NUTTING COMPANY

EMPLOYEE OWNED

GEOTECHNICAL, ENVIRONMENTAL AND TESTING ENGINEERS  
SINCE 1921

August 14, 1996

W.O. 99999.915 crk

CORPORATE CENTER  
4120 AIRPORT ROAD  
CINCINNATI, OHIO 45226  
(513) 321-5816  
FAX (513) 321-0294

Ms. Troy Simmons  
U.S. Regulatory Commission  
Region III  
801 Warrenville Road  
Leslie, IL 60532-4351

**RE: Theft of Model 3411B Nuclear Density Gage  
Serial No. 16093  
Owner - H. C. Nutting Company  
Cincinnati, Ohio  
License No. 34-18882-01  
Docket No. 03-17304  
Corrected 11/5/96**

Dear Ms. Simmons:

In accordance with the requirements of the NRC regulations and confirming our telephone conversations of August 7th and 8th, 1996, regarding the theft and recovery of the referenced nuclear density gage.

Sometime between 12:00 p.m. Tuesday, August 6, 1996, and 7:00 a.m. Wednesday, August 7, 1996, a 1992 Jeep Cherokee Laredo belonging to one of our field representatives, Mr. Chris Shewmaker, was stolen from the Madison Apartments located at 2341 Madison Road, Cincinnati, Ohio.

As indicated, the vehicle belonged to one of our soils technicians whose daily operations involve the use of the nuclear density gage at a project located in the greater Cincinnati area. The gage in question was secured in the vehicle's concealed luggage compartment. Both the gage and its shipping box were locked as per our standard practice. It appears that the unknown party gained entrance to the vehicle by simply smashing out the driver's side window.



# H. C. NUTTING COMPANY

EMPLOYEE OWNED

GEOTECHNICAL, ENVIRONMENTAL AND TESTING ENGINEERS  
SINCE 1921

August 14, 1996

W.O. 99999.915 crk

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4120 AIRPORT ROAD  
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Upon discovery of the missing vehicle, our technician notified our office immediately and then notified the local authorities concerning the theft of the vehicle in question as well as the presence of the nuclear device contained in the vehicle.

The writer was notified of the theft at approximately 7:15 a.m. whereupon he went to the Madison Apartments and met with the technician involved. After obtaining a brief history of the incident, he proceeded to District #2 Police Station. At the station, he briefed the officer's involved in the investigation regarding the nature of the radioactive gage.

The local law enforcement agency notified all surrounding enforcement agencies as well as the State Highway Patrol concerning the theft of the vehicle. In addition, we contacted the local television and radio stations concerning a public announcement regarding the theft. The announcements were made throughout the day as well as the 6:00 p.m. news on all local television stations.

In regards to recovery, our technician received a call from the State Highway Patrol that they had recovered the vehicle in question. They recovered the vehicle in a suburb of Columbus, Ohio. This notification was received on Thursday, August 8, 1996, at approximately 12:30 a.m. The technician then notified our office the following morning at which time we contacted the law enforcement agency in question regarding the condition of the nuclear meter and its shipping container. We were advised that the units appeared to be undamaged and all locks were in tact. This condition was confirmed by our Columbus, Ohio division.

On Saturday, August 10, 1996, the police released the gage into our custody. The instrument in question was picked up by our Columbus facility and returned to our Cincinnati division on Sunday, August 11, 1996.

As indicated, when the vehicle and meter were recovered the units were kept in the possession of the police authority while the investigation was being completed and upon completion of their initial investigation they released the gage to our Columbus, Ohio office.

If you have any questions and/or require additional information on the context of this letter or the sequence of events, please feel free to contact the writer.

Respectfully submitted,  
**H. C. NUTTING COMPANY**



Walter W. Becker  
Radiation Safety Officer

~~JOHN E. HARTLEY~~ 614 863 0475

## ATTACHMENT C

**Pacific Nuclear Technology Co.**

2545 W 10th St Ste H  
Antioch CA, 94509  
(916) 708-6800  
(916) 708-6856 FAX

**REPORT OF LEAK TEST**

CUSTOMER: H.C. NUTTING CO  
790 MORRISON RD  
COLUMBUS, OH 43230  
WM BECKER

MODEL NO: TEL 34198

SERIAL NO: T341 17761

ISOTOPE: Cs-137 8 mCi  
Am-241 40 mCi

DATE OF TEST: 10/26/1996

The sample identified above was submitted for leak test analysis.

DATE OF ANALYSIS: 11/02/1996 ANALYSIS NUMBER: 16848

RESULTS: BACKGROUND COUNT: 253 cpm  
GROSS COUNT: 258 cpm

REMOVABLE  
CONTAMINATION: NIL microcurie

NOTE: The US Nuclear Regulatory Commission and the Agreement States require that the analysis of the wipe from a sealed source must be capable of detecting the presence of 0.005 microcurie (185 Bq) on the sample. The count on the wipe was below a Lower Limit of Detection of 0.0081 microcurie. The source is not considered leaking. This report should be retained three years for viewing by regulatory agencies.

SIGNED

*W. R. Harrison*  
Office of Radiation Safety  
Calif RRM Lic No 6634-07

Meter #17761

ATTN:

Bill

Becker