

FORM NRC-313 I
(1-79)
10 CFR 30

U.S. NUCLEAR REGULATORY COMMISSION

1. APPLICATION FOR:
(Check and/or complete as appropriate)

APPLICATION FOR BYPRODUCT MATERIAL LICENSE
INDUSTRIAL

a. NEW LICENSE

b. AMENDMENT TO
LICENSE NUMBER
X 04-07316-06

c. RENEWAL OF
LICENSE NUMBER

See attached instructions for details.

Completed applications are filed in duplicate with the Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555 or applications may be filed in person at the Commission's office at 1717 H Street, NW, Washington, D.C. or 7915 Eastern Avenue, Silver Spring, Maryland.

2. APPLICANT'S NAME (Institution, firm, person, etc.)

THIRTY-FIRST Naval Construction Regiment

TELEPHONE NUMBER AREA CODE - NUMBER EXTENSION
(805) 982-4020

3. NAME OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION

BUC Paul J. RENAUD, Safety Chief

TELEPHONE NUMBER AREA CODE - NUMBER EXTENSION
(805) 982-4020

4. APPLICANT'S MAILING ADDRESS (Include Zip Code)

THIRTY-FIRST Naval Construction Regiment
Code R32
Port Hueneme, CA 93043-5008

5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED
(Include Zip Code)

Naval Construction Regiment construc-
tion sites at military activities.

(IF MORE SPACE IS NEEDED FOR ANY ITEM, USE ADDITIONAL PROPERLY KEYED PAGES.)

6. INDIVIDUAL(S) WHO WILL USE OR DIRECTLY SUPERVISE THE USE OF LICENSED MATERIAL
(See Items 16 and 17 for required training and experience of each individual named below)

FULL NAME

TITLE

a. Naval Construction Battalion personnel who have completed the Radiation
Safety Course for users of Nuclear Moisture/Density Meters given at Naval
b. Construction Training Center, Port Hueneme, CA.

7. RADIATION PROTECTION OFFICER

BUC Paul J. RENAUD (Primary)
BUC Robert T. Dubois (Alternate)

Attach a resume of person's training and experience as outlined in Items
16 and 17 and describe his responsibilities under Item 15.

8. LICENSED MATERIAL

L I N E NO.	ELEMENT AND MASS NUMBER A	CHEMICAL AND/OR PHYSICAL FORM B	NAME OF MANUFACTURER AND MODEL NUMBER (If Sealed Source) C	MAXIMUM NUMBER OF MILLCURIES AND/OR SEALED SOURCES AND MAXIMUM ACTI- VITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME D
(1)	CESIUM-137	CESIUM CHLORIDE	CAMPBELL PACIFIC	10 MILLCURIES (1 SOURCE)
	AMERICIUM-241	AMERICIUM OXIDE	NUCLEAR 7502C84	50 MILLCURIES
(2)	CESIUM-137	CESIUM CHLORIDE	TROXLER DRAWING	10 MILLCURIES (1 SOURCE)
	AMERICIUM-241	AMERICIUM OXIDE	#3138	50 MILLCURIES
(3)	AND NO OTHERS			
(4)				

DESCRIBE USE OF LICENSED MATERIAL
E

(1) CAMPBELL PACIFIC NUCLEAR MOISTURE/DENSITY GAUGE
(2) TROXLER DRAWING MODEL 3401B OR 3411B MOISTURE DENSITY GAUGE
(3)
(4)

8509120150 850830
NMS6 LIC30
04-07316-06 PDR

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9. STORAGE OF SEALED SOURCES						
L I T E R A T U R E N O.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED	NAME OF MANUFACTURER	MODEL NUMBER			
(1)	TYPE 7A PROVIDED BY MANUFACTURER	CAMPBELL PACIFIC MANUFACTURING				
(2)	TYPE 7A PROVIDED BY MANUFACTURER	TROXLER MANUFACTURING				
(3)						
(4)						

10. RADIATION DETECTION INSTRUMENTS						
L I T E R A T U R E N O.	TYPE OF INSTRUMENT	MANUFACTURER'S NAME	MODEL NUMBER	NUMBER AVAILABLE	RADIATION DETECTED (alpha, beta, gamma, neutron)	SENSITIVITY RANGE (milliroentgens/hour or counts/minute)
	A	B	C	D	E	F
(1)	GEIGER-MUELLER	VARIOUS	AN/PDR-27	ONE AT EACH SITE	BETA/GAMMA	6-506 MR/HR
(2)	ALPHA SCINTILLATION	VARIOUS	AN/PDR-56	"	ALPHA/BETA	1 - 1 X 10 ⁶ CPM
(3)	GEIGER-MUELLER	VARIOUS	E-140N OF DT304 PROBE	"	BETA/GAMMA	0 - 1 X 10 ⁶ CPM
(4)						

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10	
<input type="checkbox"/> a. CALIBRATED BY SERVICE COMPANY NAME, ADDRESS, AND FREQUENCY NEAREST RADIAC REPAIR FACILITY EVERY SIX MONTHS. LIST OF FACILITIES PROVIDED BY NRC LICENSE 08-00038-12 ISSUED TO NAVAL ELECTRONICS SYSTEM COMMAND.	<input type="checkbox"/> b. CALIBRATED BY APPLICANT Attach a separate sheet describing method, frequency and standards used for calibrating instruments.

12. PERSONNEL MONITORING DEVICES		
TYPE (Check and/or complete as appropriate.) A	SUPPLIER (Service Company) B	EXCHANGE FREQUENCY C
<input type="checkbox"/> (1) FILM-BADGE <input checked="" type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD) <input type="checkbox"/> (3) OTHER (Specify) _____	NAVAL MEDICAL COMMAND NATIONAL CAPITAL REGION RADIATION SAFETY SERVICE BETHESDA, MD 20814	<input type="checkbox"/> MONTHLY <input type="checkbox"/> QUARTERLY <input checked="" type="checkbox"/> OTHER (Specify) <u>EVERY 6 MONTHS</u>

13. FACILITIES AND EQUIPMENT (Check where appropriate and attach annotated sketch(es) and description(s).)	
<input type="checkbox"/> a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include titration, if any), ETC <input checked="" type="checkbox"/> b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC <input type="checkbox"/> c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC <input type="checkbox"/> d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC	

14. WASTE DISPOSAL	
a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED: RETURN TO MANUFACTURER OR TRANSFER TO LICENSED COMMERCIAL DISPOSAL SERVICE IN ACCORDANCE WITH NAVSUPINST 5101.9	
b. IF COMMERCIAL WASTE DISPOSAL SERVICE IS NOT EMPLOYED, SUBMIT A DETAILED DESCRIPTION OF METHODS WHICH WILL BE USED FOR DISPOSING OF RADIOACTIVE WASTES AND ESTIMATES OF THE TYPE AND AMOUNT OF ACTIVITY INVOLVED IF THE APPLICATION IS FOR SEALED SOURCES AND DEVICES AND THEY WILL BE RETURNED TO THE MANUFACTURER, SO STATE	

INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17

Describe in detail the information required for Items 15, 16 and 17. Begin each item on a separate page and key to the application as follows:

15. **RADIATION PROTECTION PROGRAM.** Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures *(if needed)*, day-to-day general safety instruction to be followed, etc. If the application is for sealed source's also submit leak testing procedures, or if leak testing will be performed using a leak test kit, specify manufacturer and model number of the leak test kit.
16. **FORMAL TRAINING IN RADIATION SAFETY.** Attach a resume for each individual named in Items 6 and 7. Describe individual's formal training in the following areas where applicable. Include the name of person or institution providing the training, duration of training, when training was received, etc.
 - a. Principles and practices of radiation protection.
 - b. Radioactivity measurement standardization and monitoring techniques and instruments.
 - c. Mathematics and calculations basic to the use and measurement of radioactivity.
 - d. Biological effects of radiation.
17. **EXPERIENCE.** Attach a resume for each individual named in Items 6 and 7. Describe individual's work experience with radiation, including where experience was obtained. Work experience or on-the-job training should be commensurate with the proposed use. Include list of radioisotopes and maximum activity of each used.

18. CERTIFICATE

(This item must be completed by applicant)

The applicant and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 30, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.

WARNING: 18 U.S.C. Section 1001, Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

a. LICENSE FEE REQUIRED
(See Section 170.31, 10 CFR 170)

b. CERTIFYING OFFICIAL *(Signature)*

c. NAME *(Type or print)*
J. M. BARRETT, LCDR, CEC, USN

(1) LICENSE FEE CATEGORY

d. TITLE
OPERATIONS/SAFETY OFFICER

(2) LICENSE FEE ENCLOSED \$

e. DATE

12 JULY 1985



DEPARTMENT OF THE NAVY
THIRTY-FIRST NAVAL CONSTRUCTION REGIMENT
PORT HUENEME, CALIFORNIA 93043

COM31STNCRINST 5100.2A
R32
22 January 1985

COM THIRTY-FIRST NCR INSTRUCTION 5100.2A

Subj: SAFE HANDLING PROCEDURES FOR NUCLEAR MOISTURE/DENSITY METER

- Ref: (a) 10 CFR 20, Standards for Protection Against Radiation (NOTAL)
(b) NAVMED P-5055, Radiation Health Protection Manual
(c) NAVFACINST 5100.15, Radiological Affairs Support Program; standards, requirements and information for
(d) 49 CFR Parts 171-179, Department of Transportation Regulations (NOTAL)
(e) NAVELEXINST 9673.9, Radiac Equipment Allowances for Naval Shore Establishment; guidelines for administration of (NOTAL)
(f) NAVSUPPUB 505, Packaging and Handling of Dangerous Materials for Transportation by Military Aircraft (NOTAL)
(g) NAVSUPINST 5101.9, Disposition of Radioactive Waste Materials; procedures for (NOTAL)

- Encl: (1) Administrative and Operational Safety Procedures for the Nuclear Moisture/Density Meter
(2) Nuclear Regulatory Commission Materials License No. 04-07316-06 (SC)
(3) Radiation Safety Officer Appointment Letter sample

1. Purpose. To provide safe handling procedures for the use of the nuclear moisture/density meters, FSN 2C 6625-146-6867 and FSN 6695-01-073-3396.

2. Cancellation. COM31STNCRINST 5100.2 is hereby cancelled.

3. Background. The subject meter contains a sealed radiation source containing cesium-137 and americium-241. Cesium-137 emits gamma rays which are partially scattered by soil. The amount of reflection is a measure of the soil density. Americium-241 emits alpha particles that interact with beryllium in the source to produce high energy neutrons which are slowed and partially scattered by the moisture of the soil. The number of slow neutrons detected by the meter is a measure of the moisture content of the soil. Electronic measurement of reflected gamma rays and slow neutrons may be made in minutes whereas other standard non-nuclear methods of density and moisture measurement take hours. Standards for protection against radiation are established by references (a), (b) and (c). Conformance to these standards shall be satisfied by observing the procedures set forth in enclosure (1), the conditions of the specifications of the Nuclear Regulatory Commission (NCR), and the Materials License authorizing use of the nuclear moisture density meters by 31ST NCR and subordinate units, enclosure (2).

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3. Action. The Nuclear Moisture/Density Meter may be operated at CBC Port Hueneme, CA or deployment sites under operational control of Commander, Construction Battalions, U. S. Pacific Fleet as required. 31ST NCR (Code R40) will store the meter. The following conditions and restrictions apply to use of the meters:

a. A Radiological Safety Officer (RSO) shall be appointed by Commander, 31ST NCR and shall have successfully completed the Radiation Safety Officer (RSO) Course offered by the Naval Sea Systems Command Detachment, Radiological Affairs Support Office, Yorktown, VA. He/she shall provide consultation and advice concerning the controls for the hazards associated with radiation sources contained in the meter and shall ensure that the controls and handling procedures provided in enclosure (1) are strictly observed. The 31st NCR RSO shall have primary responsibility for ensuring all conditions of the NRC license are being met and that radiation safety programs established by subordinate units are in compliance with this instruction. (R)

b. A deploying or deployed unit may arrange for a meter to be shipped to their deployment site only after a Radiological Safety Officer or Petty Officer (RSO) is appointed in writing by the battalion commanding officer. This individual must have successfully completed the RSO course offered by the Naval Sea Systems Command Detachment, Radiological Affairs Support Office, Yorktown, VA or Nuclear Moisture/Density Meter operator training obtained at Engineering Aide "C" School, at Port Hueneme, California or Gulfport Mississippi, and must be assigned to the location (main body or detail site) where the meter will be used. Unit RSOs shall be appointed in writing using the format of enclosure (3). (R)

c. Only properly trained and certified personnel may use or supervise the use of the Nuclear Moisture/Density Meter. Operator training may be obtained at Engineering Aide "C" School.

d. All personnel adjacent to the subject meter operations or storage area must be generally informed of the hazards and safety precautions concerning the meter.

e. The meters will be transferred from one site to another only with the express, written approval of Commander, 31ST Naval Construction Regiment.

f. Leak test shall be conducted under the direction of the 31ST NCR RSO every six (6) months, and files maintained at COM31STNCR, Port Hueneme, CA (Code R32). (R)

g. As license holder, Commander 31ST NCR shall require the Regimental RSO to inspect each field or deployment site

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holding a meter to ensure that all provisions of this instruction are being fully complied with. In addition, the 31ST NCR RSO shall ensure that an inventory of all nuclear moisture density meters held by the Pacific Naval Construction Force be conducted every six months.

(R)


H. F. SMITH II
Chief Staff Officer

DISTRIBUTION LIST:
COM31STNCRINST 5216.1S
List II (c-g), Case 1;
List III, Case 2

Copy to:
COMCBPAC

22 January 1985

ADMINISTRATIVE AND OPERATIONAL PROCEDURES

FOR THE

NUCLEAR MOISTURE/DENSITY METER

1. Radiological Hazard. To avoid the possibility of unnecessary exposure to ionizing radiation, strict adherence to all procedures outlined in this instruction is required. This instrument contains approximately 10 millicuries of cesium-137 and 50 millicuries of americium-241. The exact amounts are indicated on the assay tag of the instrument. Cesium-137 emits gamma rays (.661 MeV) and americium-241 emits alpha particles which interact with beryllium in the source to produce high energy neutrons (in a spectrum to 10 MeV). The combined external gamma and neutron levels should not exceed 10 mrem/hr at one foot when the source is retracted and shielded in the normal storage condition, thus presenting little hazard. More caution should be exercised when the source is unshielded during use or in the event the source should become stuck in the use (unshielded) position as the radiation level is approximately 6000 mrem/hr on contact (such procedures are defined below). In its undamaged configuration, the radioactive source encapsulation meets "special form" requirements as specified by reference (d). But, if the source is broken or leaking, there exists the possibility of dispersion of radioactive contamination and the possibility of ingestion or inhalation of radioactive material resulting in internal exposure. Because of these potential hazards, naval construction personnel are prohibited from performing any maintenance which involves opening or dismantling the source holder with the meter.

2. Radiological Safety Officer or Petty Officer. A Radiological Safety Officer (RSO) or Petty Officer is appointed, in accordance with reference (c), to provide consultation and advice concerning the controls for the hazards associated with radiation sources. The RSO or Petty Officer of Naval Mobile Construction Battalions (NMCBs) must complete the radiation safety training course for authorized users currently offered semi-annually at the Naval Sea Systems Command Detachment, Radiological Affairs Support Office, Yorktown, VA or Nuclear Moisture/Density Meter operator training obtained at Engineering Aid "C" School located at Port Hueneme California or Gulfport, Mississippi. The RSO or Petty Officer is responsible for:

(R)

a. Supervising the operations and procedures of the subject meter in accordance with this instruction.

b. Assuring that the radiation protection standards in references (a) and (b) are not exceeded.

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c. Conducting, or having conducted, radiation surveys of storage and typical operation areas and maintaining the results on file during possession and use of the meter. These surveys will be repeated whenever shielding, equipment, operating, or storage parameters change so as to affect radiation safety.

d. Assuring that personnel monitoring devices are worn by personnel handling or operating the subject meter.

e. Conducting, or having conducted, all leak tests as required by paragraph 6.

f. Monitoring all packages prepared for shipment, verifying radiation levels and proper shipping labels and documents.

g. Investigating each known or suspected occurrence of high personnel exposure to determine the cause and take steps to prevent its recurrence.

h. Acting as competent authority in directing action to be taken in the event of a damaged or leaking meter, following the procedures of paragraph 5.

i. Being familiar with:

(1) Fundamentals of radiation protection.

(2) Personnel dosimetry.

(3) Use of radiac instruments.

(4) Handling of radioactive material.

3. Certification. Certification of satisfactory completion of the Radiation Safety Course for Users of Nuclear Moisture/Density Meters shall be required prior to operator use or supervising use of the meter. This training may be obtained from Naval Construction Training Centers (NCTCs). Record of certification shall be included in the operator's service record.

4. Operating Procedures. All users shall observe the manufacturer's operating instruction and the following procedures. Further, the manufacturer's instructions and paragraphs 4 and 5 of this instruction shall be maintained with the subject meter at all times.

a. Certified personnel must be present and directly use or supervise the use of the meter.

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b. An operable AN/PDR-27 radiac meter, calibrated within six (6) months, shall be available when using the subject meter. Reference (e) provides complete details for establishing radiac equipment allowances. All radiation levels measured with the AN/PRD-27 must be multiplied by 1.5 to correct for neutron radiation.

(R)

c. All non-operator personnel will be kept beyond the two mR/hr isodose line during a test. The distance to the two mR/hr isodose should be determined during baseline surveys and need not be measured for every test.

d. The source rod must be retracted into its shielded storage position and the shutter mechanism closed before the meter may be moved.

e. If the handle becomes stuck or fails to operate smoothly, place the meter in secure storage in accordance with paragraphs 5 and 8.

f. Do not transport the subject meter in the passenger compartment of any vehicle.

g. When the meter is not in use, padlock the meter and place it in secure storage in accordance with paragraph 8, with access controlled by the RSO/Petty Officer.

h. A utilization log must be maintained for each meter. The meter serial number, dates of use, names of authorized users, and other pertinent information shall be recorded. Copy of utilization log shall be forwarded to Radiation Safety Officer, 31ST NCR (Code 32), by the 30th of each month. When log books are filled, they shall be returned to 31ST NCR Radiation Safety Officer.

(R)

i. A list of persons to be notified in the event of an accident or suspected overexposure shall be maintained with the meter.

5. Emergency Procedures for Damaged or Leaking Meters. All users shall observe the following defective meter emergency procedures:

a. Meter with source stuck in the unshielded position.

(1) The meter shall be placed in secure storage in accordance with paragraph 8. Radiation area surveys of the storage area shall be taken to verify that the radiation levels are within the posted limits established in paragraph 8.

(2) While moving the meter, the primary radiation beam (meter bottom) must be posted away from all personnel or areas frequented by people.

(3) Notify 31st NCR by priority naval message of the situation, including precautions taken and survey results.

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(4) Prohibit further use of the meter until repairs are affected. Any use, movement, shipment, or disposal is prohibited without the specific approval of 31st NCR.

b. Meter with suspected or detected radioactive material leak.

(1) Surgeons' gloves shall be worn by all persons handling leaking meters or obtaining wipe tests. Dispose of gloves when finished by sealing within the package with the meter (See 5.b.(3) below).

(2) Leak tests of the meter and of suspected areas of contamination shall be taken, following directions given in paragraph 6.

(3) Wrap and seal the meter in at least two layers of polyethylene.

(4) Place the meter in secure storage in accordance with paragraph 8. Radiation area surveys of the storage area shall be taken to verify that the radiation levels are within the posted limits established in paragraph 8.

(5) Notify 31st NCR by priority naval message of the situation, including precautions taken, area survey results, and swipe readings, if they are above the limits established in paragraph 6.

(6) Prohibit further use of the meter until repairs are affected. Any use, movement, shipment, or disposal is prohibited without the specific approved of 31st NCR.

(7) Areas where the meter was used shall be checked for radioactive contamination and cleaned if necessary. Reference (b) defines radioactive contamination existing where loose radioactive surface contamination exceeds 450 ricrouries of beta-gamma activity or 50 ricrouries of alpha activity measured on a dry filter paper wiped over an area of 100 square centimeters. The filter paper should be monitored with an EI40N radiac meter with DT-304 probe by placing the paper nearly in contact with probe. A reading of 200 counts per minute above background is an indication that contamination limits have been exceeded. Filter paper should be sent to the nearest Radiac Repair Facility for laboratory analysis to confirm the level of beta-gamma activity and to measure the level of alpha activity. Cleaning shall be done by the RSO, or be certified operators or persons otherwise trained in health physics under the direction of the RSO/Petty Officer. Personnel cleaning such areas shall wear disposable surgeons' gloves and any additional protective clothing as directed by the RSO/Petty Officer. All radioactive material removed, including contaminated liquid waste and solid waste such as rags and protective clothing used in cleaning, shall be collected and promptly sealed in leak proof containers with labels attached stating "CAUTION - RADIOACTIVE MATERIAL." Sufficient absorbent material should be placed in the container to fully absorb all liquid waste.

c. Source detached from meter (possible in direct transmission models).

(1) Retrieve the source with handling tongs, a shovel, or by some similar remote method. Do not touch the source with the hands at any time.

(2) Using remote handling tools, wrap and seal the source in two layers of polyethylene.

(3) Using remote handling tools, place the source in the secure storage in accordance with paragraph 8.

(4) Keep personnel away from the source.

(5) Using remote handling tools to take swipes, conduct a leak test in accordance with paragraph 6.

(6) Notify 31st NCR by priority naval message of the circumstances.

d. Notification of an Incident. The user command shall immediately notify 31st NCR by priority naval message of an incident involving a nuclear/moisture density meter which may have caused or threatens to cause a whole body radiation exposure of five rem or a skin exposure of 30 rem, a loss of one day's operation of a facility, or property damage in excess of \$1,000.

e. Report of Theft or Loss. Report thefts or losses immediately by telephone or by priority naval message to 31st NCR who will make the responses to the Nuclear Regulatory Commission (NRC) required by reference (a). Information to be included in this report should include:

(1) The model and serial number of the lost meter,

(2) A description of the circumstances under which the loss or theft occurred, and;

(3) A statement of disposition or probable disposition of the meter.

6. Leak Tests. Each meter shall be tested for leakage of radioactive material upon shipment, transfer, or receipt of the subject meter, and also at intervals not to exceed six (6) months. The Regiment RS0 shall ensure leak tests are conducted.

(R)

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a. Leak testing shall be accomplished using half dollar sized pieces of filter paper, called swipes, or other absorbent material. Wipe not less than 100 square centimeter areas (approximately four inches by four inches) along seams or parts of the meter bottom and side exterior surfaces. If the meter is suspected of leaking, wear gloves while conducting the leak test.

b. Leak testing of a source which has become detached from the meter may be accomplished with a swipe held by tongs or taped on the end of a rod. A minimum distance of 12 inches from hands to the source should be maintained.

c. Check the swipe in a low background area with a E140N radiac meter with DT-304 probe. Hold the swipe nearly in contact with the DT-304 probe during measurements. If activity is observed, treat the meter or source as leaking in accordance with paragraph 5.b. If a count rate greater than 2000 counts per minute above background is observed, the leak test has definitely exceeded the limit of .005 microcuries. (See paragraph 6.e. below.). Seal the swipes in either envelopes or plastic bags to assure that any contamination is not spread.

d. Commands should obtain swipes from and send them to the nearest radiac repair facility for laboratory analysis. In sending swipes, the dose rate at the surface of the swipe must be less than 0.5 mR/hr, and the envelop/bag shall be marked "RADIOACTIVE MATERIAL - NO LABEL REQUIRED", placed in an outer container (envelop or package) and forwarded via registered mail. Any number of sealed swipes may be placed in a single outer container provided the dose rate does not exceed 0.5 mrem/hr. If this dose rate cannot be complied with, the swipes shall be shipped as radioactive material in accordance with reference (d).

e. The date of the leak test and test results shall be logged and the log retained by the unit RSO/Petty Officer. Original copy of all leak test findings with the final results expressed in microcuries shall be forwarded to 31st NCR Code R32, original copy of leak test shall remain with meter. Any leak test revealing 0.005 microcuries or greater or removable contamination indicates the meter is leaking and the emergency procedures outlined in paragraph 5.b shall be followed. 31st NCR will file the appropriate response to the NRC.

7. Personnel Dosimetry. All operators shall wear lithium-fluoride thermoluminescent dosimeters while operating the moisture density meter. Dosimeters shall be evaluated every forty-five (45) days with copy of results forwarded to 31ST NCR RSO (Code 32). Dosimeters shall be requested from local medical facilities or Naval Medical Command (Code 212) in accordance with Chapter 6 of reference (b). The request must state that the subject meters emit neutron radiation.

(R)

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8. Storage. The subject meter shall be stored in its shipping container in a secure location with access controlled by the RSO/Petty Officer. Radiation surveys of the storage area shall be taken and maintained on file, including levels outside the secure area. A sign stating "CAUTION-RADIOACTIVE MATERIAL" and including the yellow and magenta radiation trefoil shall be affixed to the shipping container. All entrances or doors into the storage area shall be posted with signs in accordance with reference (a) as follows:

a. A sign stating "CAUTION - RADIOACTIVE MATERIAL" as described above.

b. If the source is unshielded (detached source), a "CAUTION - RADIATION AREA" sign including a radiation trefoil symbol shall be posted.

c. A sign stating "CAUTION - HIGH RADIATION AREA" and including the yellow and magenta radiation trefoil shall be posted if the radiation levels exceed 100 mrem/hr combined beta-gamma and neutron dose at one foot from the meter (60 mr/jr beta-gamma). This condition could only exist if the source were stuck in the unshielded position or detached from the meter. Surveys shall also be taken to determine the 0.6 mrem/hr combined isodose line, which shall then be roped off as a restricted area and posted according to paragraph 8.b.

9. Shipment. Undamaged meters qualify as special form radioactive material and require Type A packaging as specified in reference (d), Section 173.394. This requirement will be satisfied by using the shipping container the subject meter was received in for storage and subsequent reshipment. Meters which are leaking can no longer be classified as special form and must be shipped in Type B packaging. The Naval Energy and Environmental Support Activity may be contacted for assistance in obtaining Type B containers. The applicable shipping regulations are included in references (d), (f) and (g). Procedures necessary for shipment are as follows:

a. The meter must be cushioned and braced to prevent movement inside the package under conditions normally incident to transportation.

b. Each shipping container closure device must be checked to ensure that it is properly installed, secured, and free of defects.

c. The package must have a security seal to provide evidence of unauthorized opening. A numbered lead/wire security seal may be affixed to a closure bolt, or if not feasible, a gummed label signed by the shipper should be affixed to the seam where the lid meets the package.

d. Obtain and record the highest radiation readings in millirem per hour at the locations listed below. Round off readings to the next highest 0.1 millirem per hour (i.e., 1.01 millirem/hr is recorded as 1.1 millirem/hr).

(1) On contact with the exterior surface of the shipping container.

(2) At three feet from the exterior surface of the shipping container. (This value is referred to as the TRANSPORT INDEX).

e. Select the appropriate radioactive materials shipping label using the following criteria and apply labels to two opposite sides of the package.

(1) A Radioactive White-I label is required for packages of radioactive material when the radiation dose rate at the surface of the package does not exceed 0.5 millirem per hour. (See paragraph 9.d.(2) for transport index).

(2) A Radioactive Yellow-II label is required on packages which exceed the limit in e.(1), but the maximum surface dose rate does not exceed 10 millirem per hour and the transport index does not exceed 1.0.

(3) A Radioactive Yellow-III label is required on packages which exceed the criteria for a Yellow-II label. In no case shall the transport index exceed 10, and the radiation level on contact with package must not exceed 200 millirem per hour. If radiation levels exceed these limits, contact 31st NCR Code R32 for assistance.

(4) The "CAUTION - RADIOACTIVE MATERIAL" sign affixed to the container for storage shall be removed.

f. The following markings must be applied to the outside of the shipping container. The letters must be at least one-half inch high.

(1) "USA-DOT-TYPE 7A"

(2) "RADIOACTIVE MATERIAL" SPECIAL FORM

(3) "WEIGHT _____ LBS (Gross Weight)"

(4) Name and address of receiving authority.

g. The radioactive material shipping labels selected in Step 9.e. above must have the following information placed into the spaces provided on the labels:

22 January 1985

Contents: CS-137 and AM-241

No. of Curies: 10 mCi-Cs, 50 mCi-Am (Consult label on meter for exact quantity contained in each particular meter).

Additionally, the transport index (Step 9.d.(2) above) must be entered in the box provided on the Radioactive Yellow-II or Radioactive Yellow-III labels.

h. Wipe tests shall be taken by wiping four inch by four inch areas on the outside of the shipping container with one inch diameter filter papers. Tests should be made on four areas: top, closure, seam, and two sides of the package. Wipes shall be evaluated with the E140N radiac meter with DT-304 probe. Shipment is prohibited until wipe tests have been evaluated and it is determined that there is no removable radio activity on the outside of the shipping container.

i. In addition to the information normally required on shipping documents for non-hazardous commodities, the following information must be entered on the TCMD or GBI under commodity description as shown below:

- (1) Radioactive Material Special Form, N.O.S.
- (2) Radioactive Material.
- (3) Identification Number, NA 9182.
- (4) Cesium-137 as Cs Cl in a glass fiber matrix and Americium-241 as AmO₂-Be in pellet form.
- (5) 10 mCi of Cs-137, 50 mCi of Am-241 (Consult label on meter for exact quantity contained in each particular meter).
- (6) DOT Specification, Type 7A Package.
- (7) Type of radioactive shipping label (I, II, or III); i.e., "Radioactive Yellow-II label."
- (8) Certification statement as follows: "This is to certify that the above named articles are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation and the U. S. Coast Guard." This certification shall be signed by an authorized agent of the shipping command.

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j. For military air shipments, instructions in the administrative sections of reference (f), NAVSUPPUB 505, must be followed, including the completion of DD Form 1387-2 and clearance requirements. Transportation in passenger aircraft is prohibited except as specified in reference (f). Reference (d) is applicable for commercial air shipments, and for shipments through U.S. ports.

k. In no case shall any nuclear moisture/density meter be shipped from any location without express prior written approval from 31st NCR.

10. Disposal. Serviceable meters which are no longer used in the field should be returned to stock points designated by the 31st NCR. For damaged but serviceable meters for which future use is desired, contact should be made with the 31st NCR for instructions where to ship the meter to obtain repair. All disposal shipments must meet the requirements of paragraph 9. Users shall request radioactive waste disposal instructions from Naval Supply Center, Norfolk, Virginia or Naval Supply Center, Oakland, California in accordance with reference (g) for meters which can no longer be used and for which ultimate disposal has been authorized by 31st NCR. Requests to Naval Supply Center, Norfolk or Oakland shall include the following information:

- a. Federal Stock Number
- b. Serial Number
- c. NRC License Number
- d. Radioactive Elements: Cesium-137 and Americium-241
- e. Measurement of radioactive element in millicuries:

10 millicuries of Cesium-137.

50 millicuries of Americium-241.

f. Number and type of containers in shipment, how packaged, weights and cube.

g. Radiation readings of each container in mrem/hr at the surface of the container and at three feet from the surface.

h. Location where material will be available for pickup.

COM31STNCRINST 5100.2A

22 January 1985

NUCLEAR REGULATORY COMMISSION MATERIALS

LICENSE NO. 04-07316-06

UNDER SEPARATE COVER

Enc1 (2)

COM31STNCRINST 5100.2A
22 January 1985

DEPARTMENT OF THE NAVY
COMMANDER
THIRTY-FIRST NAVAL CONSTRUCTION REGIMENT
PORT HUENEME, CALIFORNIA 93043

5100
Ser R32/

From: Commander, THIRTY-FIRST Naval Construction Regiment
To:

Subj: RADIOLOGICAL SAFETY OFFICER; APPOINTMENT AS

Ref: (a) NAVFACINST 5100.15
(b) COM31STNCRINST 5100.2
(c) 10 CFR 20, Standards for Protection Against Radiation (NOTAL)
(d) NAVMED P-5055, Radiation Health Protection Manual

1. In accordance with references (a) and (b), you are hereby appointed as the Radiological Safety Officer for the Command. As such, your duties and responsibilities are as follows:

a. To supervise the safe operation and handling of any nuclear moisture/density meters held by this command in accordance with this letter and references (a) and (b).

b. To assure that the radiation protection standards in references (c) and (d) are not exceeded.

c. To conduct, or have conducted, radiation surveys of storage and typical operation areas and to maintain the results on file during possession and use of the meter. These surveys will be repeated whenever parameters change to affect radiation safety.

d. To maintain records of nuclear moisture/density meter inventory and periodic (every six months) inventory verification.

e. To conduct, or have conducted, all leak tests required by and maintain a record of leak tests for each meter.

f. To monitor all packages prepared for shipment, verifying radiation levels and proper shipping labels and documents.

g. To maintain records of personnel exposure and investigate each known or suspected occurrence of high personnel exposure to determine the cause and take steps to prevent its recurrence.

h. To maintain a list of all trained operators.

Encl (3)

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i. To maintain a record of custody transfer of nuclear moisture/density meters.

j. To act as competent authority in directing action to be taken in the event of a damaged or leaking meter, following the procedures of reference (b).

H. F. SMITH II
Chief Staff Officer

Copy to:
COM31STNCR (Code R32)
OIC NEESA