

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

FEDERAL AGENCIES FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND,
MASSACHUSETTS, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND,
OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIAL SECTION B
631 PARK AVENUE
KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA,
PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR
WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
MATERIAL RADIATION PROTECTION SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR
WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA,
NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH,
OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON,
AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS
TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
MATERIAL RADIATION PROTECTION SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR (Check appropriate item)

☐ A. NEW LICENSE

☒ B. AMENDMENT TO LICENSE NUMBER 41-06832-07

☒ C. RENEWAL OF LICENSE NUMBER 41-06832-07

2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip Code)

Tennessee Valley Authority
Office of Construction
400 Summit Hill Drive
Knoxville, Tennessee 37902

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

Watts Bar Nuclear Plant, Spring City, TN, Singleton Materials Engineering
Laboratory, 5 miles south of Knoxville, TN; and temporary jobsites of the
applicant anywhere in the United States.

|R1

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Joseph E. Rose

TELEPHONE NUMBER

(615) 632-7840

SUBMIT ITEMS 5 THROUGH 11 ON 8 1/2 x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL

a. Element and mass number, b. chemical and/or physical form, and c. maximum amount
which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

**7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR
TRAINING AND EXPERIENCE.**

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSEE FEES (See 10 CFR 170 and Section 170.31)

FEE CATEGORY AMOUNT
ENCLOSED \$

**13. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE
BINDING UPON THE APPLICANT.**

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS
PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN,
IS TRUE AND CORRECT TO THE BEST OF THEIR 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.

SIGNATURE/CERTIFYING OFFICER

TYPED/PRINTED NAME

TITLE

DATE

Charles Bonine, Jr.

Charles Bonine, Jr.

Manager of Construction

4-17-85

14. VOLUNTARY ECONOMIC DATA

a. ANNUAL RECEIPTS

<\$250K	\$1M-3.5M
\$250K-500K	\$3.5M-7M
\$500K-750K	\$7M-10M
\$750K-1M	>\$10M

**b. NUMBER OF EMPLOYEES (Total for
entire facility excluding outside contractors)**

c. NUMBER OF BEDS

d. WOULD YOU BE WILLING TO FURNISH COST INFORMATION (Dollar and/or staff hours)
ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE
PROPOSED NRC REGULATIONS THAT MAY AFFECT YOU? (NRC regulations permit
it to protect confidential commercial or financial—proprietary—information furnished to
the agency in confidence)

☐ YES

☐ NO

FOR NRC USE ONLY

TYPE OF FEE

FEE LOG

FEE CATEGORY

COMMENTS

APPROVED BY

AMOUNT

8505280430 850510
REG2 LIC30
41-06832-07 PDR

DATE

PRIVACY ACT STATEMENT

Pursuant to 5 U.S.C. 552a(e)(3), enacted into law by section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the Nuclear Regulatory Commission on NRC Form 313. This information is maintained in a system of records designated as NRC-3 and described at 40 Federal Register 45334 (October 1, 1975).

1. **AUTHORITY:** Sections 81 and 161(b) of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2111 and 2201(b)).
2. **PRINCIPAL PURPOSE(S):** The information is evaluated by the NRC staff pursuant to the criteria set forth in 10 CFR Parts 30, 32, 33, 34, 35 and 40 to determine whether the application meets the requirements of the Atomic Energy Act of 1954, as amended, and the Commission's regulations, for the issuance of a radioactive material license or amendment thereof.
3. **ROUTINE USES:** The information may be (a) provided to State health departments for their information and use; and (b) provided to Federal, State, and local health officials and other persons in the event of incident or exposure, for their information, investigation, and protection of the public health and safety. The information may also be disclosed to appropriate Federal, State, and local agencies in the event that the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding. In addition, this information may be transferred to an appropriate Federal, State, or local agency to the extent relevant and necessary for an NRC decision or to an appropriate Federal agency to the extent relevant and necessary for that agency's decision about you.
4. **WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION:** Disclosure of the requested information is voluntary. If the requested information is not furnished, however, the application for radioactive material license, or amendment thereof, will not be processed. A request that information be held from public inspection must be in accordance with the provisions of 10 CFR 2.790. Withholding from public inspection shall not affect the right, if any, of persons properly and directly concerned need to inspect the document.
5. **SYSTEM MANAGER(S) AND ADDRESS:** U.S. Nuclear Regulatory Commission
Director, Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
Washington, D.C. 20555

Item 5

RADIOACTIVE MATERIAL

<u>Element and Mass Number</u>	<u>Chemical and/or Physical Form</u>	<u>Maximum Amount Possessed At Any One Time</u>
1. Cesium 137	Sealed Source Per Troxler Dwg. #A102112	Not to Exceed 10 Millicuries/Source. 5 Sources Maximum
2. Americium 241	Sealed Source Per Troxler Dwg. #A102451	Not to Exceed 10 Millicuries/Source. 5 Sources Maximum

Item 6

PURPOSE(S) FOR WHICH LICENSED MATERIALS WILL BE USED

The materials listed in Item 5 will be used in Troxler Model 3401 or 3411 Nuclear Moisture-Density Gages. These gages are used in determination of moisture content and density of compacted earth in construction earth-fill operations.

Item 7

INDIVIDUAL(S) RESPONSIBLE FOR RADIATION
SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE

1. Stephen P. Stagnolia, Office Radiological Safety Coordinator. | R1
(Resume Attached)
2. Robert B. Maxwell, Jr., TVA Radiation Safety Officer (Resume Attached)

Item 7

STEPHEN P. STAGNOLIAEducation:

B.S. in Mechanical Engineering, Tennessee Tehnological University, 1967

Work Experience:

September 1981 to Present - Supervisor, Welding Engineering Staff, Tennessee Valley Authority, Office of Construction, Knoxville, Tennessee

Responsible for overall technical direction of construcion welding program and NDE programs. This inlcudes tehcnical direction of the industrial radiography program for construcion. Served as Alternate Division of Construction Radiation Safety Officer.

May 1979 to Sept. 1981 - Supervisor, Welding Quality Control Unit, Hartsville NP, Tennessee Valley Authority, Hartsville, Tennessee

Supervised all field welding engineering and NDE activities at the plant. This also included overall supervision of both contract and force-account field radiography operations.

May 1976 to May 1979 - Supervisor, Welding Engineering Unit, Sequoyah NP, Soddy-Daisy, Tennessee.

Supervised all field welding engineering and NDE activities at the plant, including contract radiography operations.

Sept. 1967 to October 1976 - Mechanical Engineer, Sequoyah and Browns Ferry NP

Supervised field welding engineering and NDE activities, including contract radiography operations.

Item 7

ROBERT B. MAXWELLEDUCATION

BS in Physics, Tennessee Technological University, 1965. Radiological Monitor Instructor, Univeristy of North Carolina Extension Division, 1970. MS in Nuclear Physics, North Carolina State University, 1971.

EXPERIENCE

June 1979 to Present - Chief of Health Physics Services, Radiological Health Staff, Tennessee Valley Authority, Muscle Shoals, Alabama.

September 1978 to June 1979 - Acting Assistant Branch Chief, Radiological Hygiene Branch, Tennessee Valley Authority, Muscle Shoals, Alabama.

November 1975 to September 1978 - Supervisor of the Environmental Radiological Assessment Section, Radiological Hygiene Branch, Tennessee Valley Authority, Muscle Shoals, Alabama

November 1972 to November 1975 - Health Physicist, Environmental Planning and Assessment Staff, Division of Environmental Planning, Tennessee Valley Authority, Chattanooga, Tennessee.

August 1971 to November 1972 - Health Physicist, Industrial and Radiological Hygiene Branch, Tennessee Valley Authority, Muscle Shoals, Alabama.

September 1967 to August 1971 - Assistant Radiological Safety Officer, North Carolina State University, Raleigh, North Carolina.

September 1965 to September 1967 - Health Physicist, Applied Health Physics Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

June 1965 to September 1965 - Aerospace Technologist, National Aeronautics and Space Administration, Manned Spaceflight Center, Houston, Texas.

Item 8

TRAINING FOR INDIVIDUALS WORKING IN OR
FREQUENTING RESTRICTED AREAS

Training for personnel involved in the use of licensed material is provided by TVA's Offsite Support Section in Muscle Shoals, Alabama. Classroom training consists of four (4) to eight (8) hours training, depending on class comprehension. A test is administered at the end of the classroom instruction and requires a passing grade of 80 percent or better for qualification. Details of this information have been previously submitted to your Mrs. Isabel Martin via letter from Charles Bonine, Jr. on February 13, 1984

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FACILITIES AND EQUIPMENT

During periods when the moisture density gauges are not used at the temporary construction site, the gauges will be transferred and stored at TVA's Watts Bar Nuclear Plant. Storage will be in an unattached building (See Sketch #1) which will be locked at all times with limited and controlled access to keys. The building is posted in accordance with 10 CFR Part 20. During periods of storage, the gauges will remain in their US DOT approved shipping cases.

R1

During periods of calibration or repair, the moisture density gauges will also be kept at TVA's Singleton Materials Engineering Lab in the calibration and repair room (See Sketch #2). This room is at basement level, dirt filled on two sides with unoccupied storage areas on the remaining sides. This room will also be kept locked at all times with limited and controlled access to keys. The building is also posted in accordance with 10 CFR Part 20.

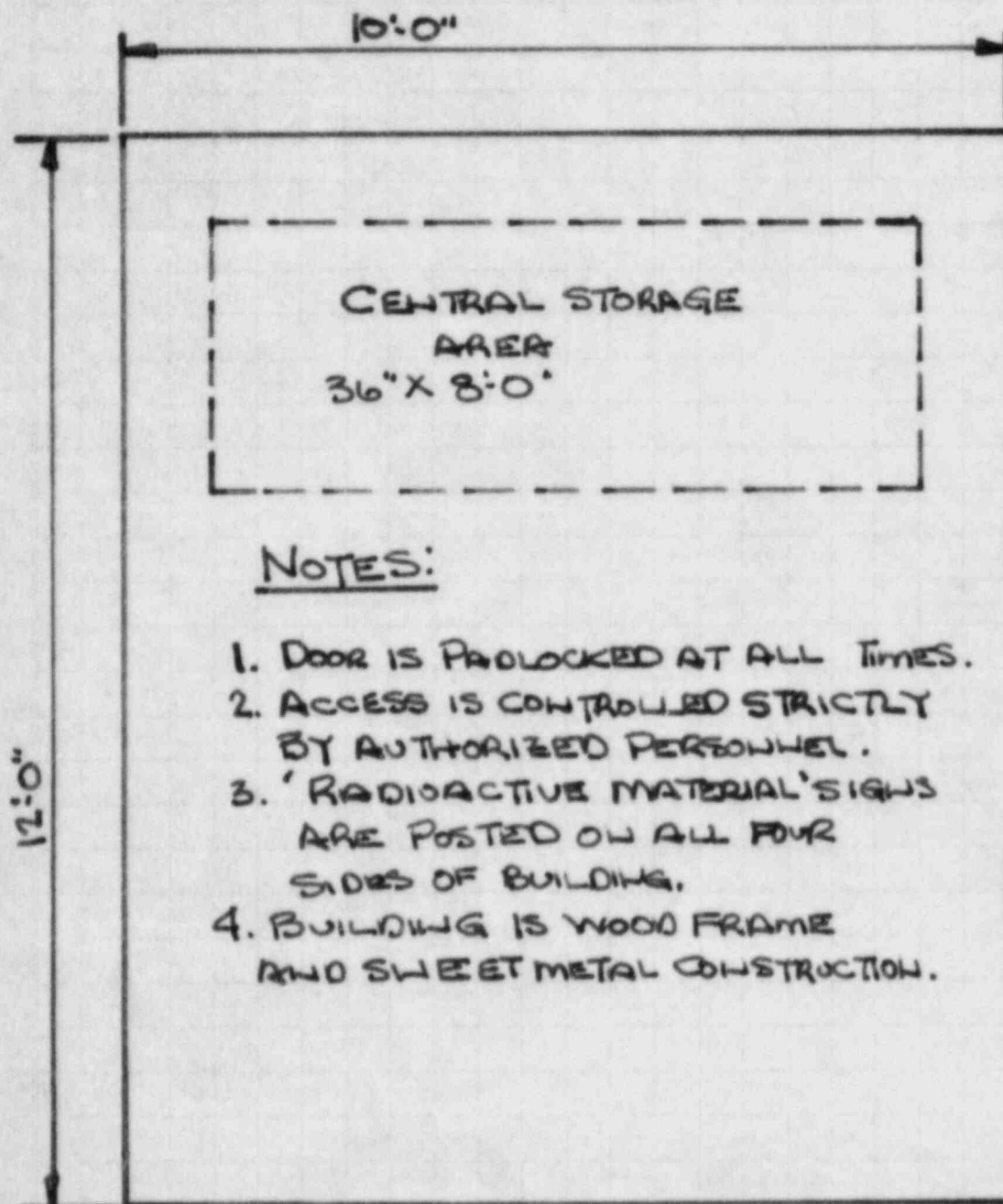
Personnel working in the area will be required to wear TLD dosimeters. For electronic repair purposes, the shaft containing the sealed Cesium-137 or Radium-226 source will be removed from the gauge housing and stored in a Model 100761 Troxler storage container. The exposure rate at the surface of the storage container is approximately 10 Mr/hr. The normal placement of the storage container is a minimum of 8 feet from the workbench area. The sealed sources will not be opened or altered in any way.

The sealed source in the materials analyzer will not be removed from the instrument. The analyzer is a bench-top unit shielded such that no external radiation is present.

SUBJECT ISOTOPE STORAGE FACILITYPROJECT WBHPCOMPUTED BY JERDATE 4/5/85

CHECKED BY

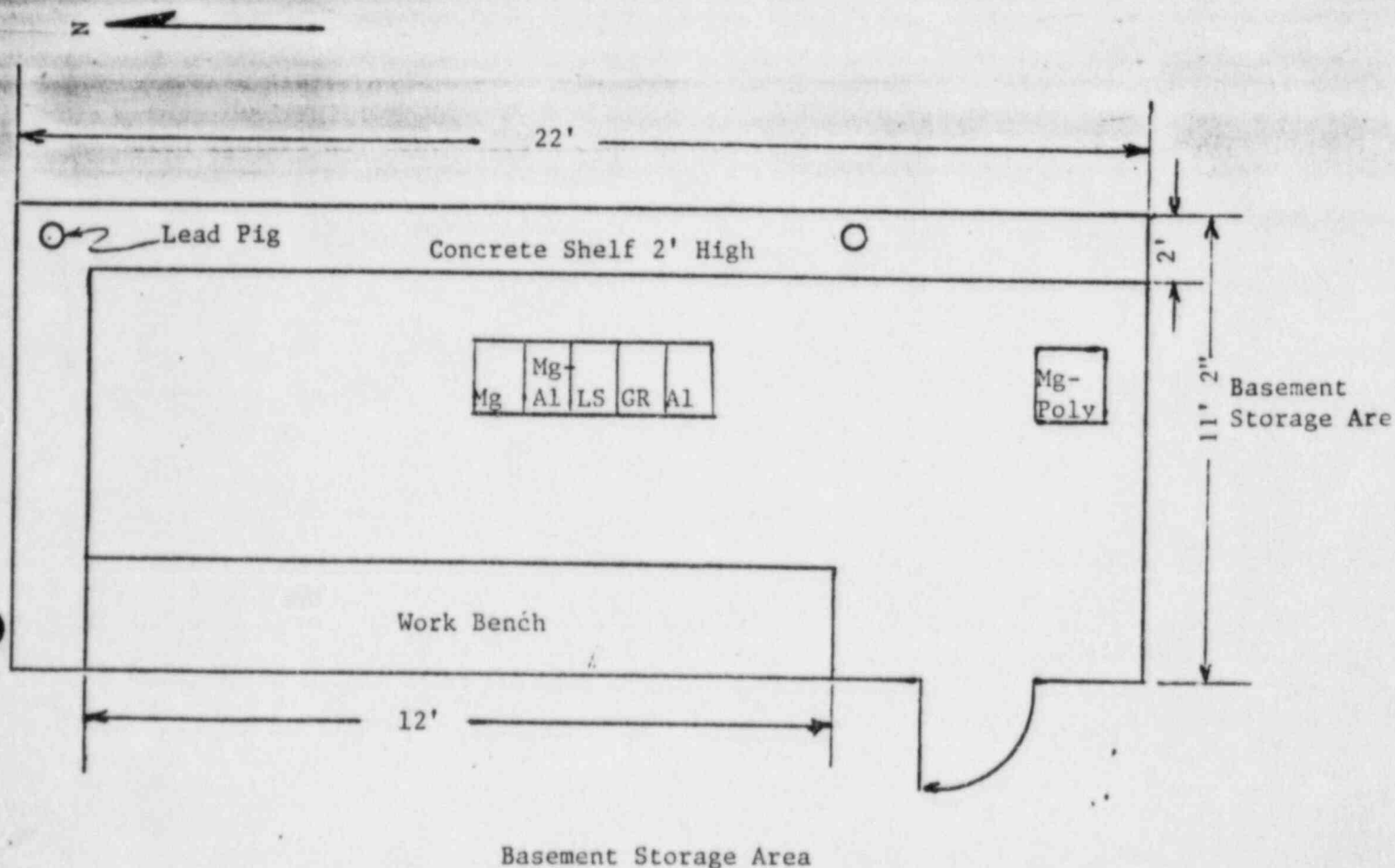
DATE



WATTS BAR NUCLEAR PLANT
TROXLER AND GAMMA CAMERA
STORAGE BUILDING

TROXLER NUCLEAR MOISTURE-DENSITY GAUGE

SUBTERRANEAN BASEMENT CALIBRATION ROOM



Notes:

1. 8 in. concrete block wall, north and east sides.
2. 1/2 in. plywood walls, 4 in. through, insulated, south and west sides.
3. 7 ft ceiling, 1/2 in. plywood, insulated between floor joists.
4. Trouble shooting and repair of gauges conducted on 30 in. by 12 ft work bench with source rod in lead pig.

RADIATION SAFETY PROGRAM

Personnel Monitoring Equipment

All personnel using licensed mlllll will wear a Thermoluminescence Dosimeter (TLD) which is managed by the TVA's Dosimetry Section in Muscle Shoals, Alabama. The TLD is exchanged on a monthly basis in accordance with TVA's Officewide Practice.

Radiation Detection Instruments

Several types of survey instruments are used. They are used as follows:

<u>Type</u>	<u>Manuf.</u>	<u>Model No.</u>	<u>No. Avail.</u>	<u>Radiat. Detected</u>	<u>Sensitivity Range</u>
Survey Meter	Victoreen	492	>10	Beta, Gamma	0-100 Mr/hr
Survey Meter	Eberline	295	>10	Beta, Gamma	0-100 Mr/hr
Survey Meter	G. E. Smith	GS-100A	>10	Beta, Gamma	0-100 Mr/hr

Instrument calibration of the above listed survey instruments will be done at 3-month intervals using a 50 curie Cesium-137 standard with calibration traceable to the National Bureau of Standards.

The instrument will be placed in a field of known exposure rate at two levels for each scale.

Adjustments will be made so that the performance at each level is within +10 percent of the full scale range. The neutron instruments will be calibrated with a 160 gm PU/Be source with its calibration traceable to the National Bureau of Standards.

The calibration procedures and facilities used are the same as those used in support of TVA's nuclear power plants.

Leak Testing

For leak testing procedures See Attachment 1.

Radiation Safety Program (Cont.)

Maintenance

Any maintenance required on the Troxler equipment will be performed in conjunction with routine calibration at the Singleton Materials Engineering Laboratory. Personnel working on any calibration or maintenance activities will be required to wear TLD badges and utilize survey instruments. Maintenance will consist of replacing electronic modules only. During this repair; the shaft containing the Cesium-137 or Radium-226 sealed source will be removed from the gage housing and stored in a Troxler Model 100761 Storage container.

Sealed sources will not be opened or altered in any way.

All personnel involved in repair and/or calibration operations shall have been trained by factory technicians in the maintenance of Troxler equipment and have satisfactorily completed Item 8 to this license, "Training for Individuals Working in or Frequenting Restricted Areas."

Transportation of Devices to Field Locations

Packaging and transport of licensed material and devices will be carried out in accordance with applicable Department of Transportation (DOT) regulations.

Operating and Emergency Procedures:

For operating and emergency procedures see Attachment 2.

Duties and Responsibilities of the Radiation Protection Officer and Radiation Control Supervisor are outlined in Attachment 3.

Item 10

Attachment 1

SOURCE LEAK TESTING PROCEDURE

Leak tests will be performed by health physics technicians with a minimum of two years experience in the field and under the supervision of a health physicist with a minimum of two years field experience. The entire program is managed by the Dosimetry and Offsite Support Staff Chief who normally has many years experience in the field of health physics. Certified health physicists are available for consultation. R1

The sources shall be tested for leakage at intervals not to exceed six months. The test shall be capable of detecting the presence of 0.005 microcurie of alpha or beta contamination on the test sample. The test sample, using filter paper, shall be taken from the source or from appropriate accessible surfaces of the device in which the sealed source is permanently or semipermanently mounted or stored.

The filter paper will be counted in a shielded laboratory type smear counter in the central laboratory utilizing a large GM detector or gas proportional detector with an efficiency of from 10 to 30 percent.

Calibration consists mainly of standard sources bought from Eberline, supplemented by sources made in our radiological laboratory; all traceable to National Bureau of Standards.

Sample calculation:

$$\frac{\text{counts/min}}{\text{efficiency}} \frac{\text{d/min}}{\text{counts/min}} \times 2.22 \times 10^6 \frac{\text{d/min}}{\text{n Ci}} = \text{N Ci}$$

Records of leak test results shall be kept in units of microcuries and maintained for inspection.

If the test reveals the presence of 0.005 microcuries or more of removable contamination, the source will be withdrawn from use and shall be decontaminated, repaired or disposed of according to applicable regulations.

Within five (5) days after determining that a source has leaked, the Nuclear Regulatory Commission shall be notified according to applicable regulations.

Item 10

Attachment 2

OPERATING AND EMERGENCY PROCEDURES

OPERATIONAL PROCEDURE

1. Wear TLD Badge.
2. Check Battery in instrument.
3. Check calibration date on instrument.
4. Avoid unnecessary exposure by:
 - A. Limiting time and number of sources exposures.
 - B. Maintain a safe distance.
 - C. Utilize pigs.
5. Do not tamper with source.
6. Monitor frequently with instrument.
7. Leave instrument and speaker turned on when working with sources.

EMERGENCY PROCEDURE

1. Do not handle source with hands or any other method until dose calculations have been made by RSC personnel.
2. Do not leave areas or sources unsecured.
3. Do notify Health Physics Services at once.
4. Do remove all personnel from the area until hazard can be assessed.
5. Do not allow unqualified personnel to assist.
6. In the event of a fire, inform firemen of the presence of radioactive material.
7. Assure all license and regulatory requirements concerning notification are met.

Item 10

Attachment 3

DUTIES AND RESPONSIBILITIES OF THE RADIATION PROTECTION OFFICER
AND RADIATION CONTROL SUPERVISOR

The Radiation Protection Officer (RPO, Item 7A) is Robert B. Maxwell, Chief, Dosimetry and Offsite Support Staff. Mr. Maxwell's staff consists of experienced health physicists and technicians who provide necessary health physics support to all divisions of TVA.

Stephen P. Stagnolia (Item 7B) is the Radiation Safety Coordinator for the | R1
Office of Construction. The Office also currently holds NRC By-product Material License 41-06832-06 for Industrial Radiography. His responsibilities include administration of the Radiation Safety Program for the Office of Construction, adherence to Operating and Emergency Procedures, periodic surveillance, and general by-product material license requirements.

The Offsite Support Section Staff personnel will also conduct periodic inspections of facilities for compliance with regulations and adherence to safe radiological practices. They will conduct leak test as required. In addition, when economically beneficial to TVA, leak tests shall be performed using the Technical Operations Model 518 Leak Test Kits. These leak test kits are currently used in support of Construction's industrial radiography program.

Item 11

WASTE MANAGEMENT

Waste Management is not required for this equipment.