

Information in this record was deleted

in accordance with the Freedom of Information Act, exemptions 2, FOIA-06-0087

Amendment No. 39

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

<p>Licensee</p> <p>1. Department of the Army U.S. Army Communications - Electronics Command AMSEL-SF-RER</p> <p>2. Fort Monmouth, New Jersey 07703-5024</p>	<p>In accordance with the letter dated May 19, 1995, 3. License Number 29-01022-06 is amended in its entirety to read as follows:</p> <p>4. Expiration Date February 29, 2000</p> <p>5. Docket or Reference No. 030-05248</p>
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<p>6. Byproduct, Source, and/or Special Nuclear Material</p> <p>A. Any byproduct material with atomic numbers 1 through 83</p> <p>B. Cesium 137</p> <p>C. Cobalt 60</p> <p>D. Strontium 90</p> <p>E. Hydrogen 3</p> <p>F. Uranium (Natural or Depleted)</p> <p>G. Thorium (Natural)</p> <p>H. Americium 241</p> <p>I. Plutonium 238</p> <p>J. Polonium 210</p> <p>K. Californium 252</p> <p>L. Cesium 137</p>	<p>7. Chemical and/or Physical Form</p> <p>A. Any</p> <p>B. Sealed sources</p> <p>C. Sealed sources</p> <p>D. Sealed sources</p> <p>E. Accelerator targets</p> <p>F. Any</p> <p>G. Any</p> <p>H. Any</p> <p>I. Sealed sources</p> <p>J. Any</p> <p>K. Sealed source</p> <p>L. Sealed sources (J.L. Shepherd Model 6810)</p>	<p>8. Maximum Amount that Licensee May Possess at Any One Time Under This License</p> <p>A. Not to exceed 1 curie per radionuclide and 10 curies total</p> <p>B. <input type="checkbox"/> curies</p> <p>C. <input type="checkbox"/> curies Ex 2</p> <p>D. 5 curies</p> <p>E. 30 curies</p> <p>F. 5 kilograms</p> <p>G. 10 kilograms</p> <p>H. 1 millicurie</p> <p>I. 10 microcuries</p> <p>J. 10 microcuries</p> <p>K. <input type="checkbox"/> 1</p> <p>L. 136 curies Ex 2</p>
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9. Authorized use

A. through K. Research and development as defined in 10 CFR 30.4; for training and instrument calibrations.

L. For use in a J.L. Shepherd Model 81-14Q calibrator.

CONDITIONS

- 10. Licensed material may be used only at the licensee's facilities located at the U.S. Army Communications - Electronics Command, Fort Monmouth, New Jersey.
- 11. A. Licensed material shall be used by, or under the supervision of, individuals designated in writing by the Radiation Safety Committee, Joseph M. Santarsiero, Chairman.
- B. The Radiation Safety Officer for this license is Joseph M. Santarsiero
- 12. Licensed material shall not be used in or on human beings.

Q/14

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**

License number  
29-01022-06

Docket or Reference number  
030-05248

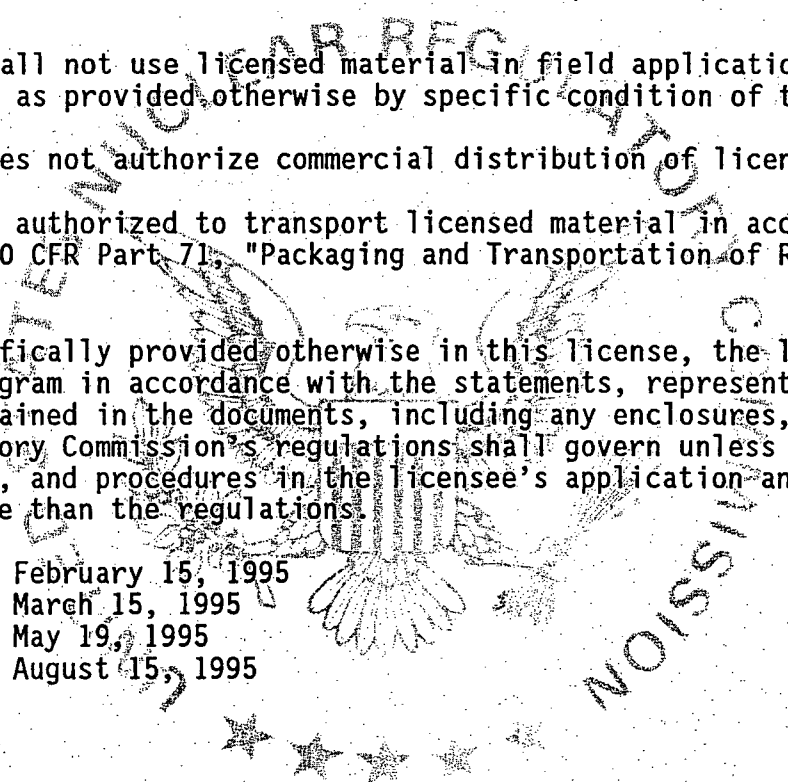
Amendment No. 39

13. A. Sealed sources and detector cells containing licensed material shall be tested for leakage and/or contamination at intervals not to exceed six months or at such other intervals as are specified by the certificate of registration referred to in 10 CFR 32.210, not to exceed three years.
- B. Notwithstanding Paragraph A of this Condition, sealed sources designed to emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed three months.
- C. In the absence of a certificate from a transferor indicating that a leak test has been made within six months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.
- D. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to any use or transfer as a sealed source.
- E. Sealed sources and detector cells need not be leak tested if:
- (i) they contain only hydrogen-3; or
  - (ii) they contain only a radioactive gas; or
  - (iii) the half-life of the isotope is 30 days or less; or
  - (iv) they contain not more than 100 microcuries of beta and/or gamma emitting material or not more than 10 microcuries of alpha emitting material; or
  - (v) they are not designed to emit alpha particles, are in storage, and are not being used. However, when they are removed from storage for use or transfer to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source or detector cell shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.
- F. The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission and the source or detector cell shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within five days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region I, ATTN: Chief, Nuclear Materials Safety Branch, 475 Allendale Road, King of Prussia, Pennsylvania 19406. The report shall specify the source or detector cell involved, the test results, and corrective action taken.
- G. The licensee is authorized to collect leak test samples for analysis by the licensee. Alternatively, tests for leakage and/or contamination may be performed by persons specifically licensed by the Commission or an Agreement State to perform such services.

**MATERIALS LICENSE  
SUPPLEMENTARY SHEET**

License number	29-01022-06
Docket or Reference number	030-05248
Amendment No. 39	

14. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.
15. The licensee shall not acquire licensed material in a sealed source or device unless the source or device has been registered with the U.S. Nuclear Regulatory Commission pursuant to 10 CFR 32.210 or equivalent regulations of an Agreement State.
16. The licensee shall conduct a physical inventory every six months to account for all sealed sources and devices containing licensed material received and possessed under the license.
17. The licensee shall not use licensed material in field applications where activity is released except as provided otherwise by specific condition of this license.
18. This license does not authorize commercial distribution of licensed material.
19. The licensee is authorized to transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."
20. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.
  - A. Letter dated February 15, 1995
  - B. Letter dated March 15, 1995
  - C. Letter dated May 19, 1995
  - D. Letter dated August 15, 1995



Date           AUG 23 1995          

For the U.S. Nuclear Regulatory Commission  
 Original Signed By:  
**John R. McGrath**  
 By \_\_\_\_\_  
 Nuclear Materials Safety Branch  
 Region I  
 King of Prussia, Pennsylvania 19406

AUG 23 1995

Mr. Steven A. Horne  
Chief, Safety Office  
Department of the Army  
U.S. Army Communications Electronics Command  
Fort Monmouth, New Jersey 07703-5000

Dear Mr. Horne:

This refers to your license amendment request. Enclosed with this letter is the amended license.

Please review the enclosed document carefully and be sure that you understand and fully implement all the conditions incorporated into the amended license. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region I office, the Licensing Assistance Section, (610) 337-5093 or 5239, so that we can provide appropriate corrections and answers.

Thank you for your cooperation.

Sincerely,

Original Signed By:  
John R. McGrath

John R. McGrath  
Senior Health Physicist  
Nuclear Materials Safety Branch  
Division of Radiation Safety  
and Safeguards

License No. 29-01022-06  
Docket No. 030-05248  
Control No. 121831

Enclosure:  
Amendment No. 39

DOCUMENT NAME: R:\WPS\MLTR\L2901022.06

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OFFICE	DRSS/RI	N				
NAME	McGrath					
DATE	08/22/95	08/ /95	08/ /95	08/ /95		

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REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
HEADQUARTERS, US ARMY COMMUNICATIONS-ELECTRONICS COMMAND  
AND FORT MONMOUTH  
FORT MONMOUTH, NEW JERSEY 07703-5000

M516

Q-Ø



15 August 1995

U.S. Nuclear Regulatory Commission  
Region I  
475 Allendale Road  
King of Prussia, PA 19406-1415

This refers to US Nuclear Regulatory Commission (NRC) License Number 29-01022-06, Docket Number 030-05248, Control Number 121831 and to your 20 June 1995 request for additional information.

The following information is provided and is keyed to your 20 June 1995 letter to us:

a. Question 1: Our telephone number has been changed to: (908) 427-3112/4427.

b. Question 2: We desire to continue processing this amendment request under NRC License No. 29-01022-06. This license incorporates radioactive commodities managed by our command, world-wide. The J.L. Shepherd and Associates Model 81 Calibrator is being procured for use in support of our research and development mission and will only be used in our radiation facility located in Building 9401, Evans Area. Addressed below is our training requirement and procedures for use of the calibrator.

(1) Training of individual(s) who will use the J.L. Shepherd Model 81 Calibrator: The radiation hazards associated with the use of this calibrator are similar to those associated with the use of the AN/UDM-1A Radiac Calibrator Set. The user training requirements for this calibrator will be the same as for users of the AN/UDM-1A Radiac Calibrator Set. These are covered in Supplement E of the application to NRC License 29-01022-14, which states:

"AN/UDM-1 and -1A Radiac Calibrator Sets and M3A1 Radioactive Source Set. To qualify as an operator or user a person must have a minimum of eight hours training under the guidance of a qualified Local RPO in the basic fundamentals of radiological operations, radiac instrumentation, survey techniques and on-the-job training in operation and care of the radiac calibrator set. Instructions shall include safe working practices and inherent hazards associated with the calibrator."

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121831  
AUG 21 1995

The training of users of the J.L. Shepherd & Associates Model 81 Series Multi Source Calibration Facilities will consist of the following:

"To qualify as an operator or user a person must have a minimum of eight hours training under the guidance of a qualified Local RPO in the basic fundamentals of radiological operations, radiac instrumentation, survey techniques and on-the-job training in operation and care of the J.L. Shepherd & Associates Model 81 Series Multi Source Calibration Facilities. Instructions shall include safe working practices and inherent hazards associated with the calibrator."

(2) Procedures: Enclosure 1 is the J.L. Shepherd Model 81 Installation and Operating manual. Enclosure 2 is the calibration standard operating procedure for the calibrators currently in use in building 9401, Evans Area. The bold print portions are the changes to the SOP that will be incorporated when the J.L. Shepherd Model 81 calibrator is installed.

c. Question 3: The use of this calibrator will be in a calibration facility in total control of approved calibrator operators utilizing locked access as the method of preventing unauthorized entry. Anytime the calibrator is used, an operator will be present or the only access door to the calibration room will be locked. In either case, a warning sign/light is installed at the only access door and this sign is illuminated to alert personnel that the source is in the exposed position. The beam port of the calibrator is aimed away from the door. If an abnormal condition or emergency should require entry to manually place the source in the shielded position, the operator can approach the calibrator from the rear and will not be exposed to the unshielded source. The calibrator has an installed sonalert alarm that sounds just prior to a source being raised into the beamport. This is to alert personnel in the area that an exposure sequence is about to be initiated. When any of the sources is raised from the safe/shielded position, a warning beacon on the calibrator is illuminated.

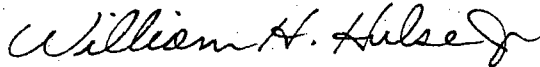
d. Question 4: The area above the calibration room is the building roof. The design of the calibrator beam port will prevent the unshielded beam from passing through any portion the ceiling of the calibration room. The dose rate on the roof will

be the product of backscatter radiation. Radiation levels on the roof are not expected to be significant. During installation and acceptance tests of the calibrator, a dose rate survey will be performed on the roof while the highest activity source in the open position. The roof is not occupied routinely and would only be accessed for maintenance. If radiation dose rates are detected during testing that warrant protective measures, any access points to the roof will be posted and access to the roof will be restricted when the calibrator is in use.

Your expeditious processing of this amendment request is appreciated.

Our Point of Contact is Mr. Barry J. Silber, Facsimile on (908) 532-6403 or (908) 542-7161; Voice on (908) 427-4427/3112.

Sincerely,



for Steven A. Horne  
Chief, Safety Office

Enclosures

Copy Furnished:

Commander, U.S. Army Materiel Command, ATTN: AMCSF-P, 5001  
Eisenhower Avenue, Alexandria, Virginia 22333-0001

J.L. SHEPHERD & ASSOCIATES

1010 ARROYO AVE, SAN FERNANDO, CALIFORNIA 91340-1822

818-898-2361

FAX 818-361-8095

**INSTALLATION & OPERATION MANUAL  
FOR MODEL 81 SERIES  
MULTI SOURCE GAMMA CALIBRATOR**

J.L. SHEPHERD & ASSOCIATES

1010 ARROYO AVE, SAN FERNANDO, CALIFORNIA 91340-1822

818-898-2361 FAX 818-361-8095

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J.L. SHEPHERD & ASSOCIATES

1010 ARROYO AVE, SAN FERNANDO, CALIFORNIA 91340-1822

818-898-2361 FAX 818-361-8095

**INSTALLATION & OPERATION MANUAL  
FOR MODEL 81  
MULTIPLE SOURCE GAMMA CALIBRATOR**

**Model 81-xxx  
S.N. XXXX**

**NOTICE: IF AT ANY TIME THIS CALIBRATOR MALFUNCTIONS, REMOVE THE SYSTEM FROM OPERATION IMMEDIATELY AND CALL J.L. SHEPHERD & ASSOCIATES FOR INSTRUCTIONS ON CORRECTIVE PROCEDURES.**

**I. MODEL 81 RADIATION SAFETY**

The Model 81 Calibrator emits an intense beam of radiation through the area subtended by the beamport whenever the source is in the "EXPOSED" position. A much lower level of scattered radiation extends in a penumbra surrounding the primary beam. The user should set up exclusion lines for personnel using this calibrator, as well as limit room access. Ordinarily, this information is included as part of the facility operation rules and is required as part of the user's license to possess this calibrator.

**A. Leak Test Procedure**

1. Locate the source in the "OFF" position.
2. Wipe the upper end of the source rods where they exit from the top of the shielded container with a piece of absorbent material. Wiping the area where the operating tower meets the top of the shield is acceptable.

3. These wipes should be measured on an instrument capable of detecting 0.005  $\mu\text{Ci}$  of Cs-137, Co-60 or Sr-90, depending upon isotope loading of your device.
4. If contamination above this level is detected, remove the device from service immediately and notify the manufacturer.

NOTE: The 0.005  $\mu\text{Ci}$  level is that generally prescribed by Regulatory Authorities; individual institutions may require more stringent standards.

## II. INSTALLATION

### A. REMOVAL OF MODEL 81 FROM 2OWC-5 OVERPACK (if required):

1. Using a 13/1611 or 3/411 deep well socket (as required), remove the nuts from the 16 each 1/211 rods located approximately 511 from the outer rim of the top of the overpack.
2. Sling the top chine of the overpack or attach a 1/2-13 eyebolt to the center left point and lift the top section, using a vertical lift so as not to bend the rods. The top section is approximately 1611 high.
3. Remove any wood shoring from the top and sides of the device in the overpack.
4. Attach a cable or chain to the eyebolts provided and lift the device vertically from the overpack.
5. Remove the metal or wood round affixed to the bottom of the device.

### B. MODEL 81 ASSEMBLY

The Model 81 Beam Calibrator is shipped in four parts: Base, Source Shield, Operational Tower assembly, and Control Panel.

1. Bolt the calibrator to the base provided.
2. Place the calibrator complete with Cesium-137 sources in the desired location.

3. The operating tower which contains the pneumatic assembly is shipped with the outside cover or shroud attached. Remove the shroud from the tower assembly. NOTE: To remove the shroud, use the following procedure:
  - (a) Remove the piece of copper tubing with compression fittings, that extends from a fitting on the side of this tower base to the tee outlet from the oiler-filter-regulator.
  - (b) Open the cover and disconnect the Jones plug inside the cover.
  - (c) Unbolt the cover from the tower base and remove.
  - (d) Remove the padlock and lock off bolt which holds the cylinders) in the extended position. These may be replaced later to lock the source assembly in the "OFF" position.
4. Remove the shipping plate from the top of the calibrator. The dose rate at the top of the irradiator will be approx. 1/mR/hr - at contact. Dose rates surrounding the calibrator with all sources in the "OFF" position, will be less than 5mR/hr at one foot from the surface.
5. Place the pneumatic cylinder assembly on top of the calibrator. Locate over the bolt pattern provided, noting the orientation of the tower with the arrow stamped on top of the base plate pointing toward the beamport. Secure the tower to the shield with washers and nuts provided.
6. Block the beamport with the solid lead plug provided, if it is not already in position.
7. From the position at the rear of the calibrator (opposite the beamport), raise the source rod, which is at the centerline of the calibrator, slightly. Engage the threaded end of the rod into the tapped hole at the end of the fixture which is mounted to the cylinder rod. Thread the rod in until the dimensional requirement of the source centering sketch are met. Firmly tighten the source rod set screws. Installation of the source assembly is now complete.

NOTE: Care must be taken so that no parts, chips, or foreign materials drop into the tube, (at the top of the calibrator) through which the source rod assemblies operate.

8. Mount the shroud over the cover assembly, reattaching the Jones connector which connects all wiring from the inside of the tower to the components which are mounted on the tower cover.
9. Next, connect air supply rated 90 psi or greater, to the inlet of the oiler-filter-regulator. NOTE: the Primary unit requires a setting of 60 lbs. and secondary regulator requires a setting of 20 lbs. to function properly. This is factory adjusted, and may be adjusted slightly in the field. See adjustment section. Next, fill the oiler section of the oiler-filter-regulator with SAE 10 weight non-detergent oil as indicated in the instructions for the oiler-filter-regulator contained as part of this manual.

C. CONTROL PANEL INSTALLATION

1. All noted in #3 above, all cabling from the Model 81 must be connected to the amphenol connectors in the back of the control cabinet. All radiation warning lights, sirens, alarms, etc., must be connected to corresponding amphenol connectors as marked in the control cabinet.
2. Plug the control cabinet into a 115V outlet, rated at 10 amps.

INSTALLATION IS NOW COMPLETE

### **III. OPERATION PROCEDURES FOR MODEL 81 MULTIPLE SOURCE CALIBRATION SYSTEM**

#### **A. TEST PROCEDURES**

All systems must be plugged in and connected per installation procedures. Turn the key switch (power) to the "ON" position. The power lights should be illuminated. The beamport plug should be installed during device check out.

#### **CHECK OUT PROCEDURES:**

1. Interlock System - With the interlock circuit closed, the interlock light in the control panel should be illuminated. Each interlock component shall have its own light which illuminates only when closed.
2. Turn the arm/safe key switch to the "Arm" position.
3. Adjustable Time Delay System - Press the "Irradiate" switch on the control panel. The sonalert should be activated for the preset time.
4. Model 81 - Unscrew and remove the rear half of the tower cover, next remove the air pressure. With the door open, raise the source rod to sufficient height to release "OFF" position microswitches. The "SAFE" light on the control panel and the "OFF" light on the tower should turn off. The "UNSAFE" light on the control panel should illuminate. The red rotating beacon on the operating tower should illuminate.

NOTE: All units (Model 81) are designed so that the sources may be raised sufficiently to test without increased personnel exposure, provided that the source rod is raised from behind the unit.

5. Lights on Operating Tower. If all sources are in the "OFF" position, all "OFF" light should be illuminated without pressing. If the source rod is away from the fully "Off" position, the rotating beacon should illuminate.

#### **B. OPERATION OF DIGITAL PRESET TIMER**

1. Place the mode selector switch to "MANUAL" or "PRESET" time.
2. To preset time, press the buttons above and below the digits on the right side of the timer.

3. With the selector switch in the "MANUAL" position the timer will show elapsed time, but will not control exposure. With the selector switch in the "PRESET" position, the timer will control the exposure. The timer counts up from "0" to the preset time.

NOTE: AFTER THE COMPLETION OF ANY EXPOSURE, IT IS NECESSARY TO PRESS THE "RESET" BUTTON BEFORE ANOTHER EXPOSURE IS INITIATED. If this is not done, the source cannot be raised. Pressing the "RESET" button will automatically reset the time previously selected. In operation, the timer starts at 00.00.00 (HRS.MINS.SECS.) and counts up to the preset time, after the exposure is completed, showing at all times the time expired on the preset exposure.

4. The electric timer is activated whenever any source is in the fully exposed position.

#### C. UNIT OPERATION

Activate the "SET-UP" switch on the operating tower, exit the room and close the door. All interlock lights on the control panel should be illuminated. Select source(s) to be exposed by operating the rotary switch on the control panel. Turn the key switch to the "ARM" position. Press "IRRADIATE" button, the alarm will sound in the room for the preset time prior to source exposure. At the end of alarm interval, the source selected will be raised to the "EXPOSED" position. The source may be returned to the fully shielded position by:

- a. Opening/Interrupting any interlock circuit.
- b. End of the preset time selected on the timer.
- c. Pushing the "OFF" button on the control panel.
- d. Pushing any interlock switch in the radiation room, or by turning interlock switch on the tower into "OFF" position.
- e. Power failure.
- f. Loss of air pressure.

#### D. POSITION INDICATING LIGHTS

1. The IRRADIATION light on the control panel is illuminated only when the designated source is in the fully exposed position.

2. The "OFF" light on the control panel is illuminated only when the source is in the fully shielded position.

E. COMPRESSOR

This Model 81 system is supplied with a self contained air supply to provide compressed air for the source operating cylinder. The ON/OFF control for this air supply is located on the right hand side of the control panel. A toggle switch controls the ON/OFF power. Make certain that the self-contained air supply is "ON" for at least 3 minutes before attempting source operation.

F. SAFETY SYSTEM

1. The master interlock light is illuminated only when all interlocks are closed.
2. Low pressure light is illuminated when pressure falls below levels set on pressure switch. This is NOT a source interlock modality.
3. All sources are returned to the fully shielded position by air pressure whenever:
  - a. Any interlock switch is open (including pressing mushroom or panic button switches.
  - b. "OFF" switch is operated.
  - c. Timer times out.
  - d. Power failure.
  - e. Pressing the "PANIC" switch.

The source is mechanically returned (by a constant force spring) to the fully shielded position in the event of loss of air pressure.

4. The shield design provides for full shielding in ALL directions, at all times, except out the beamport when the source is in the "ON" position.
5. The spring return assembly on the pneumatic source operating cylinder provides fail-safe operation in that the source(s) automatically return(s) to the "OFF" position in case of air or power failure. In addition, the normally closed solenoid valve provides pressure to hold the sources in the "OFF" position whenever air pressure is supplied to the system and the "ON" switch is not activated.

6. The source rod never touches the bottom of the tube in which it travels (clearance is approx. 1/211), eliminating the possibility of damage to the source by striking the end of the source tube.

#### G. ADJUSTMENTS

Source/shutter travel should be smooth and rapid, and should not slam in either direction.

1. To adjust the source/shutter in the Model 81, the travel speed may be changed by adjusting the pressure delivered to the cylinder, or by adjusting the flow control valves provided.
2. If the source rod/shutter travel is jerky or hesitant, the pneumatic assembly is misaligned and should be readjusted. Take care that the bottom of the pneumatic assembly is clean, and that all hold bolts are evenly adjusted. If action is not smooth and regular after this adjustment, the manufacturer should be contacted for further instructions.
3. An assembly drawing, a pneumatic schematic and an electrical schematic drawing are included as part of this manual.

#### H. GENERAL INFORMATION

The Model 81 Calibrator incorporates three Cesium-137 sources mounted on one operating rod assembly. Operation of each source is by two pneumatic cylinders controlled by separate solenoid valves. These valves in turn are activated by the control panel. All lines between solenoid valves and cylinders are equipped with flow control valves. Automatic spring return assemblies are mounted on the cylinder.

**CAUTION: AT NO TIME IS ANY LUBRICATION TO BE APPLIED TO THIS DEVICE, PARTICULARLY THE SOURCE ROD AND DRIVE MECHANISM. THE USE OF ANY LUBRICANT IMMEDIATELY VOIDS ALL WARRANTIES.**

#### I. EMERGENCY PROCEDURES

If at any time, the source(s) fails to return to the "OFF" position, (as shown by the source position indicating lights on the control panel) at the end of the preset or manual exposure, or after operation of an interlock, the following procedures are to be followed:

- a. Enter the irradiation room, approaching the calibrator from the rear (opposite beamport). Remove the access plate, and move the source rod downward until the source is in the "OFF" position. A high-range survey meter should be carried during this procedure.
- b. Take the calibrator out of operation immediately and contact the manufacturer for an authorized representative to effect repairs.

**Bold print identifies additions to cover the J.L.Shepherd Model 81 multi source gamma calibrator.**

SOP Number 20-02

**STANDARD OPERATING PROCEDURE  
FOR USE OF THE AN/UDM-1 AND AN/UDM-1A  
RADIAC CALIBRATOR SETS**

1. **PURPOSE:** To provide procedures to be employed when calibrating survey meters and dosimeters utilizing the AN/UDM-1 (SN:21), AN/UDM-1A (SN:D3 and SN:12) RADIAC Calibrator Sets and **J.L.Shepherd Model 81 multi source gamma calibrator (SN:XXXX)** located in Building 9401.

2. **SCOPE:** This procedure applies to all users of the Calibration/Exposure Room.

3. **REFERENCES:**

a. Calibrator Set, RADIAC AN/UDM-1, TM 11-6665-363-12,  
1 September 1990.

b. Calibrator Set, RADIAC AN/UDM-1A, TM 11-6665-217-12,  
1 September 1990.

c. **J.L.Shepherd & Associates, Installation and Operation Manual for Model 81 Multi Source Calibrator (JLS Model 81 MSC).**

4. **DISCUSSION:** The RADIAC Calibrator sets AN/UDM-1, ~~and~~ AN/UDM-1A, and **JLS Model 81 MSC** house a specific quantity of radioactive material. **The its radiation is being** emitted as a controlled beam of known intensity which is used as a standard in checking and calibrating RADIAC instruments.

5. **PROCEDURES:**

a. Pre-Calibration Procedure.

(1) Obtain key to unlock Calibration Room.

(2) Personal dosimetry is required when using the calibration room. At a minimum, a pocket dosimeter and whole body TLD badge must be worn by each individual.

Enclosure 2  
License No. 29-01022-06  
Docket No. 030-05248  
Control No. 121831

Dosimetry for all personnel, will be assigned by the Radiation Area Supervisor or CECOM Safety Office personnel.

(3) An appropriate doserate survey meter is also required to be used. Perform the following checks of the survey meter before each use:

(a) Does the meter have a valid calibration sticker (active) affixed?

(b) Checked the batteries?

(c) Has the meter passed a functional operation test with the radioactive source located at the entrance to the exposure room?

(4) Test Visual warning lights on calibrators. If there are any malfunctions, report the problem to the Radiation Area Supervisor.

b. Calibration.

(1) Take area readings with survey meter to ensure safety.

(2) Using the calibration reports/charts posted in the Calibration Room, set the instrument to be calibrated at the required distance considering the angular distribution of dose rate.

(3) If desired, set the viewing camera and TV monitor in such a manner that the operator can either view the screen from behind the calibrators or use the telescope. **The JLS Model 81 MSC will be operated from the remote console utilizing the TV camera and monitor to observe the instrument being checked/calibrated.**

(4) Perform the desired calibration IAW established procedures.

c. Post-Operation

(1) Ensure all calibrators have been completely shut down.

(2) Ensure viewing system has been turned off.

(3) Exit room and lock door before returning key and survey meter.

(4) Place TLD and pocket dosimeter on storage rack for subsequent use for that wearing period.

Enclosure 2  
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(5) Ensure all dosimetry entries have been annotated in logbooks and visitor logs.

6. Emergency Procedures:

a. If the source(s) does not return to its shielded position report this and any other operational malfunction to the Radiation Area Supervisor, do not attempt to correct the problem yourself.

b. EMERGENCY PHONE NUMBERS:

Radiation Area Supervisor - X75443  
Fire Department - 911  
Police - 911  
Ambulance - 911  
CECOM Safety Office - X73112, X75606

Approved by: \_\_\_\_\_ Date: \_\_\_\_\_  
Chief, Radiological  
Engineering Branch  
Radiation Protection Officer

Enclosure 2  
License No. 29-01022-06  
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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

JUN 20 1995

License No. 29-01022-06  
Docket No. 030-05248  
Control No. 121831

Mr. Steven A. Horne  
Chief, Safety Office  
Department of the Army  
U.S. Army Communications Electronics Command  
Fort Monmouth, New Jersey 07703-5000

Dear Mr. Horne:

This is in reference to your letter dated May 19, 1995 requesting an amendment to the above referenced NRC license. In order to continue our review, we need the following additional information:

1. The telephone number referenced in your letter, 908-544-3112, is apparently no longer in service. Please provide an up-to-date number.
2. You state in your letter that the J.L. Shepard calibrator will replace an AN/UDM-1A Radiac calibrator set. This calibrator set is currently on License No. 29-01022-14. We believe that it would be more appropriate to list the J.L. Shepard calibrator on License No. 29-01022-14, which contains most of your other sealed sources authorized for calibration purposes, rather than on License No. 29-01022-06. If you do not agree that this is appropriate, you will need to provide additional information concerning 1) the training of individual who will use the J.L. Shepard calibrator and 2) procedures for using the device, so that this information can be referenced in License No. 29-01022-06.
3. With regard to your calibration facility, describe how the regulatory requirements of 10 CFR 20.1601 are met. In order to meet these requirements, the safety systems and the radiation control program must:
  - a. permit entry only after actuation of a control device that causes radiation to be reduced so that an individual could not receive a dose of more the 100 mrem in an hour.
  - b. have devices that will automatically generate visible and audible alarm signals to alert personnel attempting to enter and must make at least one other individual aware of the attempted entry.

In place of these controls, the licensee may establish procedures for the continuous direct surveillance to prevent unauthorized entry.

4. With regard to the calibration room in Building 9041, please describe the area above the calibration room and the expected radiation levels in that area.

chapter, or with conditions specified in a license must be processed and evaluated by a dosimetry processor—

(1) Holding current personnel dosimetry accreditation from the National Voluntary Laboratory Accreditation Program (NVLAP) of the National Institute of Standards and Technology; and

(2) Approved in this accreditation process for the type of radiation or radiations included in the NVLAP program that most closely approximates the type of radiation or radiations for which the individual wearing the dosimeter is monitored.

**§20.1502 Conditions requiring individual monitoring of external and internal occupational dose.**

Each licensee shall monitor exposures to radiation and radioactive material at levels sufficient to demonstrate compliance with the occupational dose limits of this part. As a minimum—

(a) Each licensee shall monitor occupational exposure to radiation and shall supply and require the use of individual monitoring devices by—

(1) Adults likely to receive, in 1 year from sources external to the body, a dose in excess of 10 percent of the limits in §20.1201(a),

(2) Minors and declared pregnant women likely to receive, in 1 year from sources external to the body, a dose in excess of 10 percent of any of the applicable limits in §20.1207 or §20.1208, and

(3) Individuals entering a high or very high radiation area.

(b) Each licensee shall monitor (see §20.1204) the occupational intake of radioactive material by and assess the committed effective dose equivalent to—

(1) Adults likely to receive, in 1 year, an intake in excess of 10 percent of the applicable ALI(s) in table 1, Columns 1 and 2, of Appendix B to Part 20; and

(2) Minors and declared pregnant women likely to receive, in 1 year, a committed effective dose equivalent in excess of 0.05 rem (0.5 mSv).

[60 FR 20185, April 25, 1995]

**Subpart G—Control of Exposure From External Sources in Restricted Areas**

**§20.1601 Control of access to high radiation areas.**

(a) The licensee shall ensure that each entrance or access point to a high radiation area has one or more of the following features—

(1) A control device that, upon entry into the area, causes the level of radiation to be reduced below that level at which an individual might receive a deep-dose equivalent of 0.1 rem (1 mSv) in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates;

(2) A control device that energizes a conspicuous visible or audible alarm signal so that the individual entering the high radiation area and the supervisor of the activity are made aware of the entry; or

(3) Entryways that are locked, except during periods when access to the areas is required, with positive control over each individual entry.

(b) In place of the controls required by paragraph (a) of this section for a high radiation area, the licensee may substitute continuous direct or electronic surveillance that is capable of preventing unauthorized entry.

(c) A licensee may apply to the Commission for approval of alternative methods for controlling access to high radiation areas.

(d) The licensee shall establish the controls required by paragraphs (a) and (c) of this section in a way that does not prevent individuals from leaving a high radiation area.

(e) Control is not required for each entrance or access point to a room or other area that is a high radiation area solely because of the presence of radioactive materials prepared for transport and packaged and labeled in accordance with the regulations of the Department of Transportation provided that—

- (1) The packages do not remain in the area longer than 3 days; and
- (2) The dose rate at 1 meter from the external surface of any package does not exceed 0.01 rem (0.1 mSv) per hour.

(f) Control of entrance or access to rooms or other areas in hospitals is not required solely because of the presence of patients containing radioactive material, provided that there are personnel in attendance who will take the necessary precautions to prevent the exposure of individuals to radiation or radioactive material in excess of the limits established in this part and to operate within the ALARA provisions of the licensee's radiation protection program.

#### **20.1602 Control of access to very high radiation areas.**

In addition to the requirements in §20.1601, the licensee shall institute additional measures to ensure that an individual is not able to gain unauthorized or inadvertent access to areas in which radiation levels could be encountered at 500 rads (5 grays) or more in 1 hour at 1 meter from a radiation source or any surface through which the radiation penetrates.

#### **20.1603 [Removed]**

### **Subpart H—Respiratory Protection and Controls to Restrict Internal Exposure in Restricted Areas**

#### **20.1701 Use of process or other engineering controls.**

The licensee shall use, to the extent practical, process or other engineering controls (e.g., containment or ventilation) to control the concentrations of radioactive material in air.

30 FR 20185, April 25, 1995]

#### **20.1702 Use of other controls.**

When it is not practical to apply process or other engineering controls to control the concentrations of radioactive material in air to values below those that define an airborne radioactivity area, the licensee shall, consistent with maintaining the total effective dose equivalent ALARA, increase monitoring and limit intakes by one or more of the following means:

- (a) Control of access;
- (b) Limitation of exposure times;
- (c) Use of respiratory protection equipment; or
- (d) Other controls.

30 FR 20185, April 25, 1995]

#### **20.1703 Use of individual respiratory protection equipment.**

(a) If the licensee uses respiratory protection equipment to limit intakes pursuant to §20.1702—

(1) The licensee shall use only respiratory protection equipment that is tested and certified or had certification extended by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration (NIOSH/MSHA).

(2) If the licensee wishes to use equipment that has not been tested or certified by NIOSH/MSHA, has not had certification extended by NIOSH/MSHA, or for which there is no schedule for testing or certification, the licensee shall submit an

JUN 20 1995

License No. 29-01022-06  
Docket No. 030-05248  
Control No. 121831

Mr. Steven A. Horne  
Chief, Safety Office  
Department of the Army  
U.S. Army Communications Electronics Command  
Fort Monmouth, New Jersey 07703-5000

Dear Mr. Horne:

This is in reference to your letter dated May 19, 1995 requesting an amendment to the above referenced NRC license. In order to continue our review, we need the following additional information:

1. The telephone number referenced in your letter, 908-544-3112, is apparently no longer in service. Please provide an up-to-date number.
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  - b. have devices that will automatically generate visible and audible alarm signals to alert personnel attempting to enter and must make at least one other individual aware of the attempted entry.

In place of these controls, the licensee may establish procedures for the continuous direct surveillance to prevent unauthorized entry.

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ML 10

S. A. Horne  
Department of the Army

-2-

4. With regard to the calibration room in Building 9041, please describe the area above the calibration room and the expected radiation levels in that area.

We will continue our review upon receipt of this information. Please reply in duplicate to my attention at the Region I office and refer to Mail Control No. 121831. If you have any technical questions regarding this deficiency letter, please call me at (610) 337-5069.

In order to continue prompt review of your application, we request that you submit your response to this letter within 30 calendar days from the date of this letter.

Sincerely,

**Original Signed By:**  
**John R. McGrath**

John R. McGrath  
Senior Health Physicist  
Nuclear Materials Safety Branch  
Division of Radiation Safety  
and Safeguards

License No. 29-01022-06  
Docket No. 030-05248  
Control No. 121831

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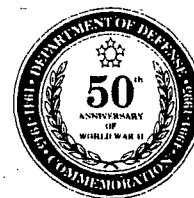
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DATE	06/15/95	06/ /95	06/ /95	06/ /95	06/ /95	

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REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
HEADQUARTERS, US ARMY COMMUNICATIONS-ELECTRONICS COMMAND  
AND FORT MONMOUTH  
FORT MONMOUTH, NEW JERSEY 07703-5000



May 19, 1995

CECOM Safety Office

SUBJECT: Request for License Amendment

Licensing Assistance Section  
Nuclear Materials Safety Branch  
U.S. Nuclear Regulatory Commission, Region 1  
475 Allendale Road  
King of Prussia, PA 19406-1415

Reference U.S. Nuclear Regulatory Commission (NRC) Materials License Number 29-01022-06, Docket No. 030-05248.


Request that the referenced license be amended to authorize possession of a J.L. Shephard & Associates (JLS) Model 81-14Q Quadruple Source Calibrator. The JLS Model 81-14Q calibrator and the sealed sources it is loaded with are NRC approved. The calibrator will be loaded with the following five sources:

<u>Radionuclide</u>	<u>Activity</u>	<u>Source Mdl No.</u>	<u>NRC Approval</u>
Cs-137	[ ] curies	6810'S	CA589S119S
Cs-137	5.2 curies	6810'S	CA589S119S
Cs-137	200 millicuries	6810'S	CA589S119S
Cs-137	25 millicuries	6810'S	CA589S119S
Cs-137	1 millicuries	6810'S	CA589S119S

The calibrator will be installed in the [ ]

The JLS Model 81-14Q calibrator will replace an AN/UDM-1A RADIAC Calibrator Set (NRC License Number 29-01022-14) currently in use at this location. This AN/UDM-1A was originally loaded with 130 curies of cesium-137. The current activity of this source is approximately 56 curies. This source no longer meets our needs for a calibrator. This AN/UDM-1A will be returned to the Army Supply System as authorized by NRC License Number 29-01022-14.

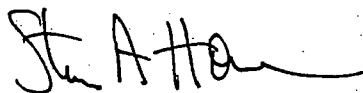
The JLS Model 81-14Q calibrator is required to support this command's calibration of portable radiation detection instrumentation and personal dosimeters.

Enclosure 1 is a drawing of  depicting the current location of the AN/UDM-1A Calibrator Set. An estimated dose rate at the building outer wall with the Model 81-14Q installed is noted on the drawing. This dose rate was calculated by measuring the current dose rate at this point with the 56 curie source in the operating position and multiplying the measured value by a factor of 2.32 (i.e., 130 curies/56 curies). Enclosure 2 is an itemized list of sources, equipment, and features of the Model 81-14Q Quadruple Source Beam Irradiator.

The installation of the calibrator will be performed by J.L. Shephard & Associates. At the time of initial operation, a radiation survey will be performed in the rooms adjacent to the calibration area and along the outer wall surface.

Our point of contact for this license amendment is Mr. David Craig, Telephone (908) 544-3112 extension 6433.

-6401  
427- Sincerely,



Steven A. Horne  
Chief, Safety Office

Enclosures

# J.L.Shepherd & Associates

1010 Arroyo Street San Fernando California 91340  
TELEPHONE 818 898 2361 FAX 818 361 8095

**FAXED**  
10 April 1995

Burt Cummings  
CECOM  
ATTN: AMSEL-SF  
Fort Monmouth NJ 07730-5000

FAX: 908 544 2667, Page 1 of 2

RE: JLS-3610, Model 81 Series Multi Source Calibration Facilities

Dear Mr. Cummings,

It was a pleasure speaking with you today. Thank you for your continued interest in J.L.Shepherd & Associates. I believe that the system which we delivered to NIST will be sufficient for your requirements. The following proposal includes our most current calibration track system. I am pleased to quote as follows:

ITEM 1. Model 81-14Q Quadruple Source Beam Irradiator, including:

- a. 130 Ci Cs-137 special form source
- b. 5.20 Ci Cs-137 special form source
- c. 200 mCi CS-137 special form source
- d. 25.0 mCi CS-137 special form source
- e. 1.0 mCi Cs-137 Special Form Source
- f. Remote control panel with 30' of cabling
- g. Source lock mechanism
- h. Source position indication lights on tower
- i. NIST traceable calibration documentation
- j. Beam centerline height - as specified
- k. Safety interlock set-up switch on operating tower
- l. External Radiation Levels not to exceed 0.5 mR/hr  
@ 30 cm from the surface of device - OFF position
- k. Device tested and certified to meet DOT 7A specifications.
- l. Radiation Warning Light with 30 feet of cabling
- m. DI-1 Door Interlock with 20 feet of cabling
- n. Installation and Operation Manual - two copies
- o. Beamport - dimensions as specified
- p. Shipping documentation

ITEM 2. Model 150R Stage II Remote Calibration Track System, including:

- a. Remote Table positioning, with joystick control or RS-232 interface capability for the X-Axis only.
- b. Closed Circuit camera/monitor system for remote calibration readings.

enclosure 2

- c. Instrument Calibration Table - engraved in a 1 CM grid, with X/Y stops for positioning multiple instruments. Table uses motorized height adjustment - 30 CM.
- d. Only low Z material is used throughout the design
- e. Digital distance indication in millimeters is accurate to  $\pm 0.4\%$  (4mm per meter).
- f. Calibration table has 20 Kg capacity.
- g. Twenty foot track length.

ITEM 3. ACCESSORIES:

- a. Panic Button (Mushroom Style)
- b. SCAS Self-contained Air Supply (noiseless)
- c. Interlock Enable Circuit
- d. PE-1 Photoelectric Interlock

ITEM 4. Installation and training of above system.  
Fort Monmouth NJ. Destinations only.

FOB: DELIVERED  
TERMS: Net 30  
DELIVERY: 90 days ARO  
VALIDITY: 12/30/95

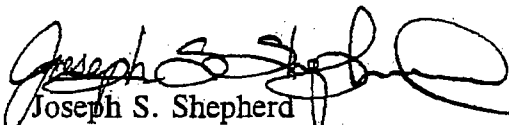
Total Package Price for above System: [REDACTED]

The quadruple source systems will incorporate dual source rods with the smallest sources being located at the top of the rod. The Cobalt 60 source rod will be positioned in back of the Cesium 137 rod for a uniform beamport to minimize scatter. Shadow effect from the small sources is not of concern as the actual time that these sources are in the port is  $\sim 0.2$  seconds as they pass the opening. We have many customers doing dosimetry with these types of systems and have NO complaints regarding the shadowing.

Please review this information at your convenience. Do not hesitate to contact me if any further questions arise. I look forward to your favored reply.

Sincerely,

J.L. Shepherd & Associates

  
Joseph S. Shepherd  
Director, Business Development