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

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR BYPRODUCT MATERIAL LICENSE
INDUSTRIAL

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.

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

	a. NEW LICENSE
	b. AMENDMENT TO: LICENSE NUMBER
X	c. RENEWAL OF: LICENSE NUMBER 20-16972-01

2. APPLICANT'S NAME *(Institution, firm, person, etc.)*
Nuclear Instrument Company
TELEPHONE NUMBER: AREA CODE – NUMBER EXTENSION
617-878-6878

3. NAME OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION
Kenneth F.Gerrish Op.Manager
TELEPHONE NUMBER: AREA CODE – NUMBER EXTENSION
617-878-6878

4. APPLICANT'S MAILING ADDRESS *(Include Zip Code)*
65 Grove Street. P.O.Box 178
Rockland,Mass. 02370

5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED *(Include Zip Code)*
65 Grove Street,Rockland,Mass. 02370

(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.	Kenneth Francis Gerrish	Operations Manager
b.	Carl Joseph Borsari	Product Manager
c.		

R/d 140

Applicant 5440
Check No. $150/3L
Amount Fee Ca...
Type of Fee Renewal
Date Check Rec'd 5/7/81
Received By Brown

RECEIVED BY LFMS
Date 5/7/81
Log May PC3 Ren.
By Brown
Orig. To
Action Compl. 5/8/81

7. RADIATION PROTECTION OFFICER ... resume of person's training and experience as outlined in Items ... 17 and describe his responsibilities under Item 16.
Carl Joseph Borsari

8. LICENSED MATERIAL

LINE 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 MILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTIVITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME D
(1)	Cesium 137	sealed source (ORNL-LR1 dwg2339A)	CDV-794 calibrator Technical Operations	130 curies
(2)	Cesium 137	sealed source	Model 28-5 J.L.Shepherd Assoc.	100 millicuries
(3)				
(4)				

DESCRIBE USE OF LICENSED MATERIAL
E

(1) Calibration standard for calibration of nuclear radiation detecting & measuring inst.

(2) Calibration standard for calibration of nuclear radiation detecting & measuring inst.

(3) 8704170204 861204
REG1 LIC30
20-16972-01 PDR

07755

(4)

COPIES SE...

9. STORAGE OF SEALED SOURCES

LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED. A.	NAME OF MANUFACTURER B.	MODEL NUMBER C.
(1)	Instrument Calibrator	Technical Operations, Inc.	CDV-794
(2)	Instrument calibrator	J.L.Shepherd Assoc.	28-5
(3)			
(4)			

10. RADIATION DETECTION INSTRUMENTS

LINE NO.	TYPE OF INSTRUMENT A	MANUFACTURER'S NAME B	MODEL NUMBER C	NUMBER AVAILABLE D	RADIATION DETECTED (alpha, beta, gamma, neutron) E	SENSITIVITY RANGE (milliroentgens/hour or counts/minute) F
(1)	survey meter	Tracerlab	SU-21	1	A,B,G	.01-80 mr/hr
(2)	survey meter	Victoreen	CDV-715	1	Gamma	.5-500 r/hr
(3)	monitor ratemeter	Tracerlab	SC-79	1	B,Gamma	10^6 c.p.m.
(4)	monitor ratemeter	Tracerlab	SC231	1	A,B,Gamma	10^5 c.p.m.

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

☐ a. CALIBRATED BY SERVICE COMPANY

NAME, ADDRESS, AND FREQUENCY

☒ 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
☒ (1) FILM BADGE	R.S.Landauer Co.	☒ MONTHLY
☐ (2) THERMOLUMINESCENCE DOSIMETER (TLD)		☐ QUARTERLY
☒ (3) OTHER (Specify): pocket dosimeters	Tracerlab, Victoreen	☐ OTHER (Specify):

13. FACILITIES AND EQUIPMENT (Check were appropriate and attach annotated sketch(es) and description(s).

☒ a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC.

☐ b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC.

☐ c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC.

☐ d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.

14. WASTE DISPOSAL

a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED

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.

Cs-137 sources would be returned to the manufacturers

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)*
$150.00	c. NAME *(Type or print)* Kenneth F. Gerrish
(1) LICENSE FEE CATEGORY: 3E	d. TITLE Operations Manager
(2) LICENSE FEE ENCLOSED: $ $150.00	e. DATE April 28, 1981

FORM NRC-313 I (1-79)

Calibration Certificate

NUCLEAR INSTRUMENT CO.

Customer _____ Probe Type _____

Instrument Model _____ Serial No. _____

Serial No. _____ Calibration Date _____

Calibration source(s)	Radium 226 [A]	Radium 226 [B]	Radium 226 [C]	Cesium 137 [D]	Cesium 137 [E]
Quantity	25.02 mg.	4.98 mg.	1.03 mg.	130 curies	100 mCi.
Mfgs. No.	11880	1582	1-738	Model 69	28-5
NBS Traceable No.	TPX 33822	11005	11005	C-396	30214
Date	8-20-70	11-5-75	9-22-77	9-14-68	10-8-79

Calculated Exposure Rate	Meter Reading	Range Maximum	Calibration Source[s]
		_____ MR/hr _____ R/hr	☐
		_____ MR/hr _____ R/hr	☐
		_____ MR/hr _____ R/hr	☐
		_____ MR/hr _____ R/hr	☐
		_____ MR/hr _____ R/hr	☐

Integrate Calculated Dose		

Beta Shield Open ☐ Closed ☐

Detector center axis parallel ☐ perpendicular ☐ to radiation field

Electronic Alignment ☐ Temperature _____ °C Barometric Pressure _____ mm(Hg) Elevation _____

Instrument check source: Scale: _____ Reading: _____

Remarks: _____

This instrument has been calibrated using procedures recommended by the A.E.C., Atomic Energy Commission.

Calibrated by _____

65 Grove Street – P.O.Box 178 – Rockland, MA. 02370 – Tel. Area Code 617 - 878-6878

NUCLEAR INSTRUMENT CO.
ROCKLAND, MASSACHUSETTS

ITEM NO. 11(b)

CESIUM-137 GAMMA RADIATION FIELD CALIBRATION PROCEDURE FOR SURVEY METERS

Calibration is accomplished using a Model 28-5 beam calibrator positioned on a calibration bench. The survey meter is free to be moved along the radiation beam center axis.

The instrument is placed on a jig at a predetermined distance from the source for the radiation intensity level required using the beam calibrator tape measure which is calibrated in centimeters and feet. The predetermined measured distance is to the virtual center of the survey meter detector and on the center axis of the radiation beam.

The instrument is then checked at two or more points on the same scale range seperated by 50% or more of the scale range using the above procedure. As the known radiation intensity level activates the instrument, the sensitivity/calibration control is adjusted until the meter indicates the radiation intensity level previously calculated. The resulting reading shall be with-in ± 10% of the true field.

A calibration label identifying the person performing calibration, the date of calibration and next due calibration date is placed on the instrument. The instrument identification, calibration date and customer is then entered in a calibration log.

A letter of certification of calibration indicating the instrument model number, detector/probe number, serial number, date of calibration, standard source identification and quantity, NBS traceability number and date is supplied.

Instrument are to becalibrated every six months and after each repair.

Calibration standards used for certification, refer to Item 8 lines 1 and 2

NUCLEAR INSTRUMENT CO.
ROCKLAND, MASSACHUSETTS

ITEM No.15 RADIATION PROTECTION PROGRAM

The CDV-794 instrument calibrator willbe operated and maintained in accordance with the operational manual supplied by the manufacturer, Technical Operations,Inc.A copy of the manual will be kept in the room housing the calibrator.A floor plan of the room housing the CDV-794 calibrator is enclosed.

The Model 28-5 instrument calibrator will be operated and maintained in accordance with the operational manual supplied by the manufacturer,J.L.Shepherd,Assoc.Inc. A floor plan of the calibration room housing the 28-5 is enclosed.

We have retained Mr.Murray Bolton of the M.I.T.Radiation Protection Office as our Radiation Safety Consultant.We will make semi-annual visits to our facility and perform wipe tests and radiation surveys of both instrument calibrators listed in item 8,line 1 and 2.

Emergency Procedure

Emergency procedure will be followed if any of the following conditions exist.

(a)Higher than normal radiation levels are detected or suspected.
(b)If there is any reason to question the proper functioning of the area monitors.
(c)If there is any indication of a malfunction of the calibrators.

In the event of any of the above,the room will be evacuated and secured and Mr.Murray Bolton and Technical Operations or J.L.Shepherd Assoc. will be notified.Mr.Bolton will visit the installation to determine the nature of the emrgency.If the emergency involves the malfunction of either calibrator,Technical Operations or J.L.Shepherd Assoc. will be notified of the situation and of our assessment.Operations will be discontinued until repairs have been completed by Technical Operations, J.L.Shepherd Assoc. or their authorized representative and the unit has been determined to be ready for safe operation by the Radiation Protection Officer after consultation with Mr.Bolton.

NUCLEAR INSTRUMENT CO.
ROCKLAND, MASSACHUSETTS

(continued)
ITEM NO. 15 RADIATION PROTECTION PROGRAM

Radiation Monitoring

Monitoring requirements for the installation will include the following:

(a)Personnel:A film badge and dosimeter will be worn when operating the calibrators and in routine shop operations.
Film badges are reported and recorded on a monthly basis.
Dosimeters are checked daily.

(b)The room housing the CDV-794 calibrator will be monitored continuously.The monitor will be calibrated every six months and after each repair using NBS traceable standards.

(c)The calibration room will be monitored continuously.The monitor will be calibrated every six months and after each repair using NBS traceable standards.

Duties and responsibilities of the Radiation Protection Officer

The responsibility of the radiation protection officer is to maintain a radiation safe enviornment and maintain liason with federal,state and local radiation control groups and the outside Radiation Safety Consultant.

Daily functions and activities are to establish and maintain operations so that the radiation exposure of each workeris kept as far below the maximum permissable exposure as possible.

Instruct personnel in safe working practices and inthe nature of injuries resulting in an overexposure to radiation.

Assure that adequate personnel monitoring devices are used where indicated and that records are kept.of the results of such monitoring. To check that monitoring device are functioning properly.To conduct periodic radiation surveys and keep records of such surveys and of wipe tests provided by the outside Radiation Safety Officer.

Include any descriptive data of any corrective measures as a result of surveys.

NUCLEAR INSTRUMENT CO.
ROCKLAND, MASSACHUSETTS

ITEM NO. 16

Resume 6A Kenneth Francis Gerrish

Classroom training provided by the manufacturer of Nuclear Instrumentation, Radioisotopes, accessories and supplies. Tracerlab, Inc. 1601 Trapelo Rd., Waltham, Mass. 02154.
Training session for two weeks period 1963 and various classroom training and lectures during employment period to 1970.

Basic Nuclear Theory-J.Brikerhoff, Physicist
a. Alpha, beta, gamma particles
b. Atomic structure, atomic no., mass
c. Isotopes, natural, manmade
d. half-life of radioisotopes
e. elementary counting statistics

Health Physics-William Karo, M.P.
a. Safety
b. film badges
c. dosimeters,
d. survey instruments

Fundamentals of Nuclear Detectors & Instruments-Alexander Filipov, ME, Product Manager
a. Early methods, dosimeters
b. Geiger-Mueller tubes
c. survey instruments
d. scalers, ratemeters
e. proportional counters
f. gas flow counters
g. scintillation detectors-spectrometry
h. low background gas flow counters

CIRCUIT Description-TRACERLAB NUCLEAR INSTRUMENTATION-Earl Hansen, Chief Dev Engr.
a. proportional preamplifiers
b. solid state scalers
c. automatic systems
SPECIFIC COUNTING SYSTEMS-Alexander Filipov, Product Manager
a. Geiger & Proportional gas flow systems
b. low background counting systems
MAINTENANCE & REPAIR OF NUCLEAR EQUIPMENT-Donald Waltenberger-Service Manager
a. test instruments
b. operational test and preventive maintenance
c. calibration of instruments and equipment
e. interpretation of data for repair purposes

NUCLEAR INSTRUMENT CO.
ROCKLAND, MASSACHUSETTS

ITEM NO.16

Resume 6B Carl Joseph Borsari

Classroom training provided by the manufacturer of Nuclear Instrumentation, Radioisotopes, accessories and supplies. Tracerlab, Inc. 1601 Trapelo Rd., Waltham, Mass. 02154.
Training session for two weeks period 1961, and various classroom training and lectures during employment period to 1970.

Basic Nuclear Theory-J.Brikerhoff, Physicist
a. Alpha, beta, gamma particles
b. Atomic structure, atomic no., mass
c. Isotopes, natural, manmade
d. half-life of radioisotopes
e. elementary counting statistics

Health Physics-William Karp, M.P.
a. Safety
b. film badges
c. dosimeters,
d. survey instruments

Fundamentals of Nuclear Detectors & Instruments-Alexander Filipov, ME, Product Manager
a. Early methods, dosimeters
b. Geiger-Mueller tubes
c. survey instruments
d. scalers, ratemeters
e. proportional counters
f. gas flow counters
g. scintillation detectors-spectrometry
h. low background gas flow counters

CIRCUIT Description-TRACERLAB NUCLEAR INSTRUMENTATION-Earl Hansen, Chief Dev Engr.
a. proportional preamplifiers
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c. automatic systems
SPECIFIC COUNTING SYSTEMS-Alexander Filipov, Product Manager
a. Geiger & Proportional gas flow systems
b. low background counting systems
MAINTENANCE & REPAIR OF NUCLEAR EQUIPMENT-Donald Waltenberger-Service Manager
a. test instruments
b. operational test and preventive maintenance
c. calibration of instruments and equipment
e. interpretation of data for repair purposes

NUCLEAR INSTRUMENT CO.
ROCKLAND, MASSACHUSETTS

ITEM 17.(6A)Experience Kenneth F.Gerrish

Work experience: Factory instrument service Class AA Technician
Final Test A Technician
Field Service Engineer
Employer,Tracerlab,Inc.1601 Trapelo Rd,Waltham,Mass. 7 years

National Service Manager
Employer,Tracerlab-ICN Corp.,Waltham,Mass.,1 year

Nuclear Instrument Company,65 Grove St.,Rockland,Mass. 10 years

Cs-137,130 curies,Cs-137,100 millicuries,Ra-226,25 mg.
various rod,disc and solutions less than 25 uc. each.

7& (6B)Experience Carl J.Borsari

Work experience: Factory instrument Service Class AA Technician
Senior Final Test Technician & lead man
Senior Engineering aide,design,test,prototype construction,
evaluation,calibration & engineering.
Employer:Tracerlab,Inc.,1601 Trapelo Rd,Waltham,Ma.9 years

Instrument repair & calibration supervisor
Tracerlab-ICN Corp.,Waltham,Ma. 1year

Cobalt 60,2 curies,Cs-137,130 curies,Cs-137,100 millicuries,
Ra.-226,25 mg.,various rod,disc,and solutions less than
25 uc.each.

Kenneth F.Gerrish and Carl J.Borsari have received extensive on the job training in nuclear instrumentation,applications,testing,repairs and calibration during above employment.

CONSULTANT

"CURRICULUM VITAE" Murray M. Bolton, Jr.

Home Address: 76 County Road
Ipswich, Mass.

Home Telephone: 617/356-3825 Business Phone: 617/253-1741

Personal:

Born 16 November 1925
Married, one child

Academic Training:

B.S. in Chemistry, University of Virginia

Graduate studies in Radiochemistry, Carnegie Institute Technology

Experience:

Chemist - Shippingport Atomic Power Station, 1958-1960

Radiochemist Supervisor - Shippingport Atomic Power Station, 1960-1962

Radiochemist - Consultant to U.S. Army Nuclear Power Program, Burns & Roe, Inc. New York, N.Y. 1962-1964

Radiochemist - Massachusetts Institute of Technology 1964-1966

Radiation Protection Chemist - Massachusetts Institute of Technology 1966-1974

Assistant Radiation Protection Officer - Massachusetts Institute of Technology 1974 - Present

Co-founder and Officer - Bio-Nuclear Measurements, Inc. Ipswich, Massachusetts

Consultant - Brandeis University, Waltham, Massachusetts

Consultant - Avco Research Laboratory, Everett, Mass.

Consultant - Dynatech Corporation, Cambridge, Mass.

Consultant - Honeywell Radiation Center, Lexington, Mass.

Consultant - Technical Operations, Burlington, Mass.

Consultant - Nuclear Metals, Concord, Massachusetts

Consultant - Norris Industries, Brockton, Mass.

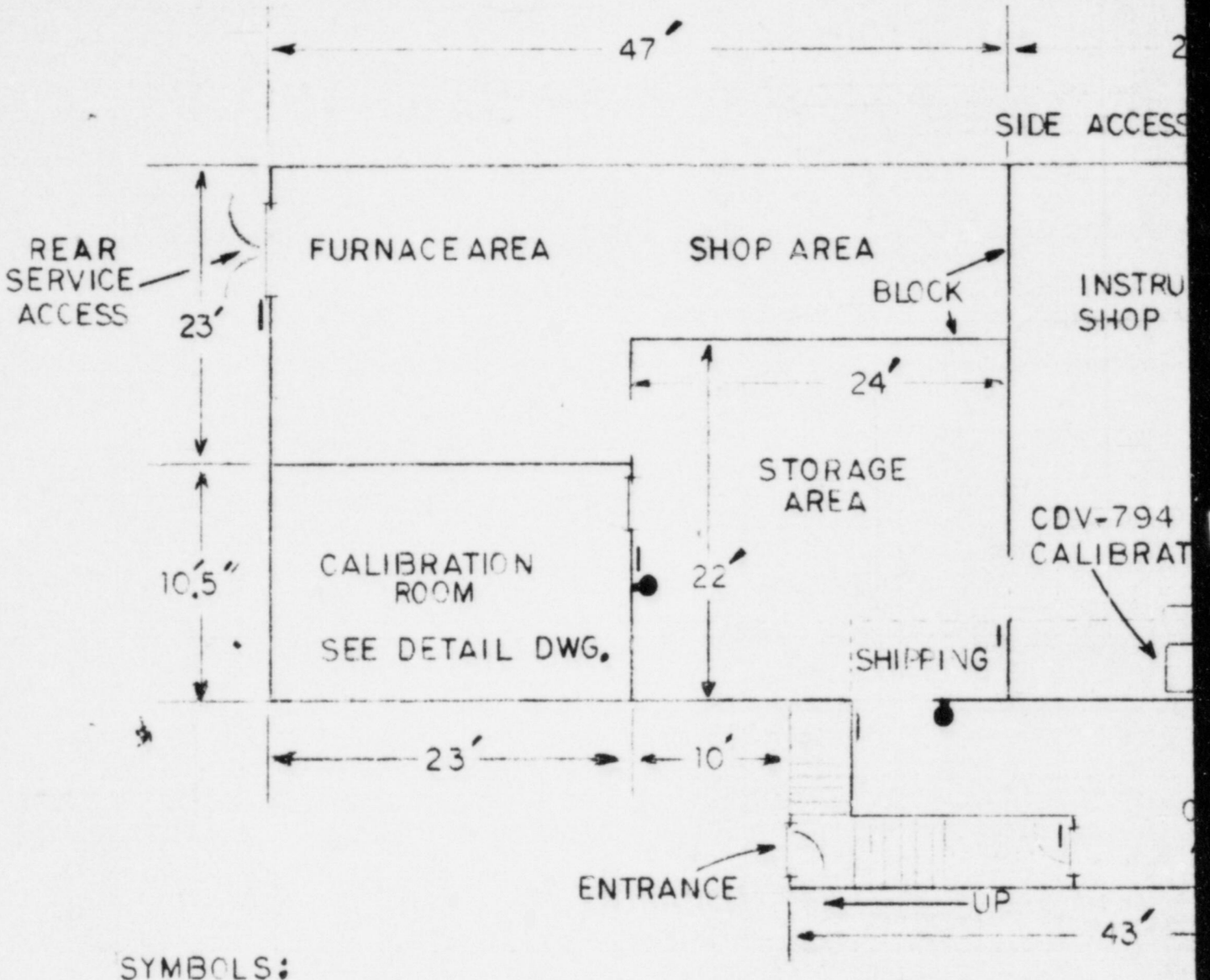
Professional Societies:

Member, American Chemical Society, 1958 to date.

Member, New England Chapter American Chemical Society, 1964 to date.

Member, Health Physics Society, 1963 to date.

Executive Board Member - New England Chapter Health Physics Society, 1969 to date.



SYMBOLS:

— RADIATION WARNING SIGNS

● RED WARNING LAMPS

NOTES:

FLOOR IS 5' BELOW OUTSIDE GROUND LEVEL

ALL WALLS ARE 12" POURED CONCRETE OTHER THAN NOTED

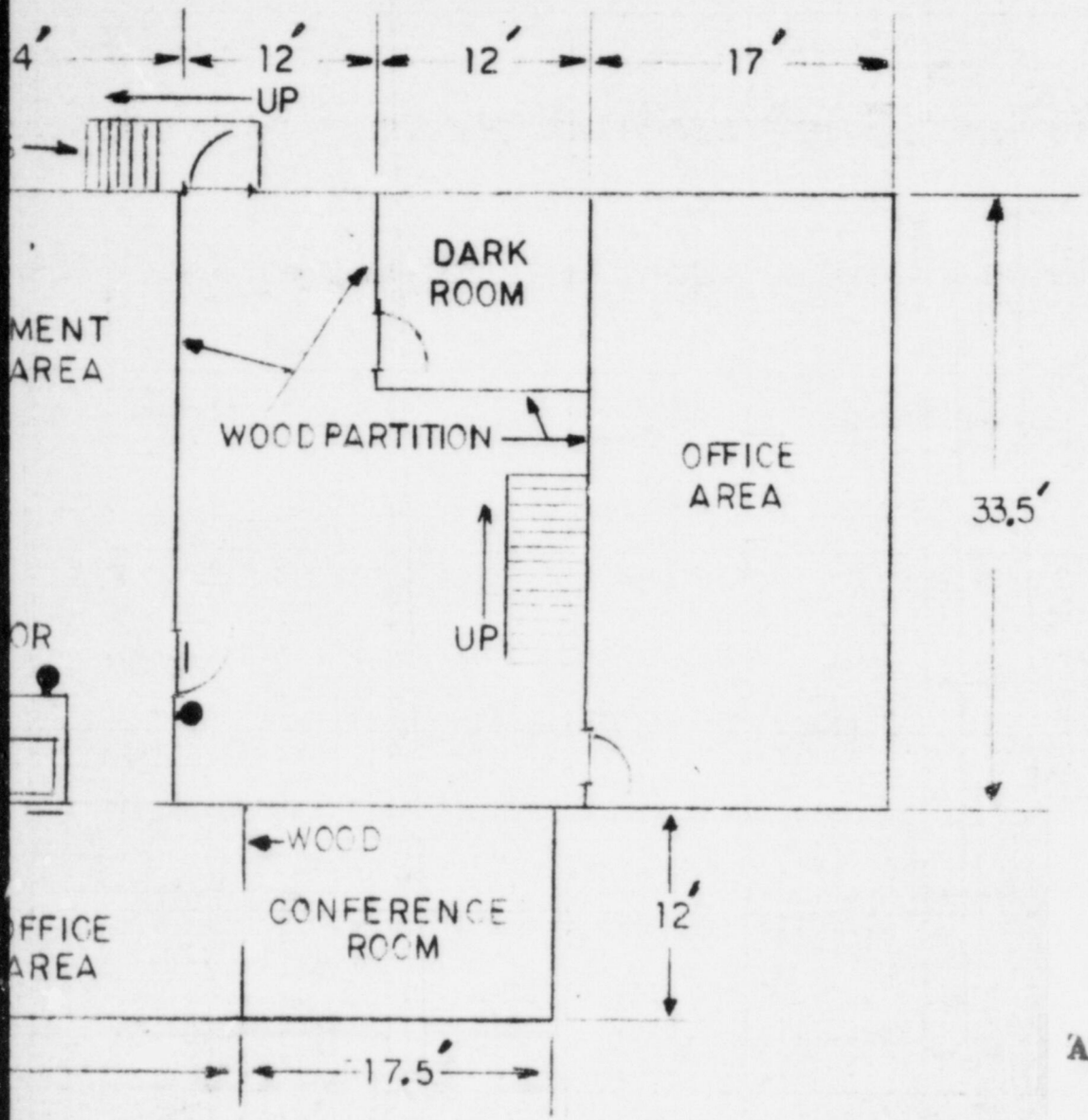
CONSTRUCTION:

FLOORS — 4" CONCRETE

CEILING — 1.5" WOOD

CEILING HT — 8'6".

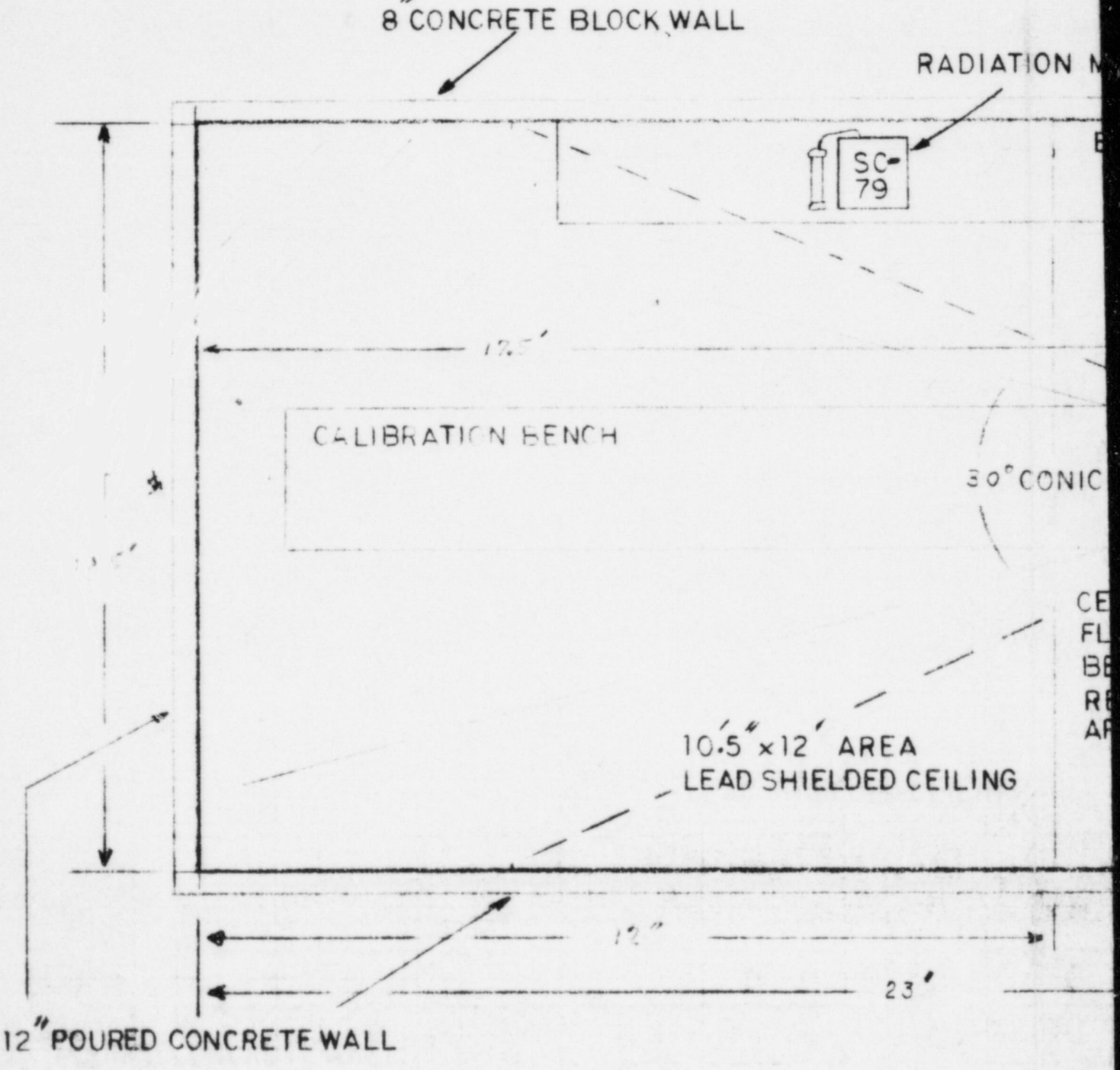
FIRE PROTECTION — AUTO SPRINKLER SYSTEM



NUCLEAR INSTRUMENT CO.

FLOOR PLAN, LOWER LEVEL

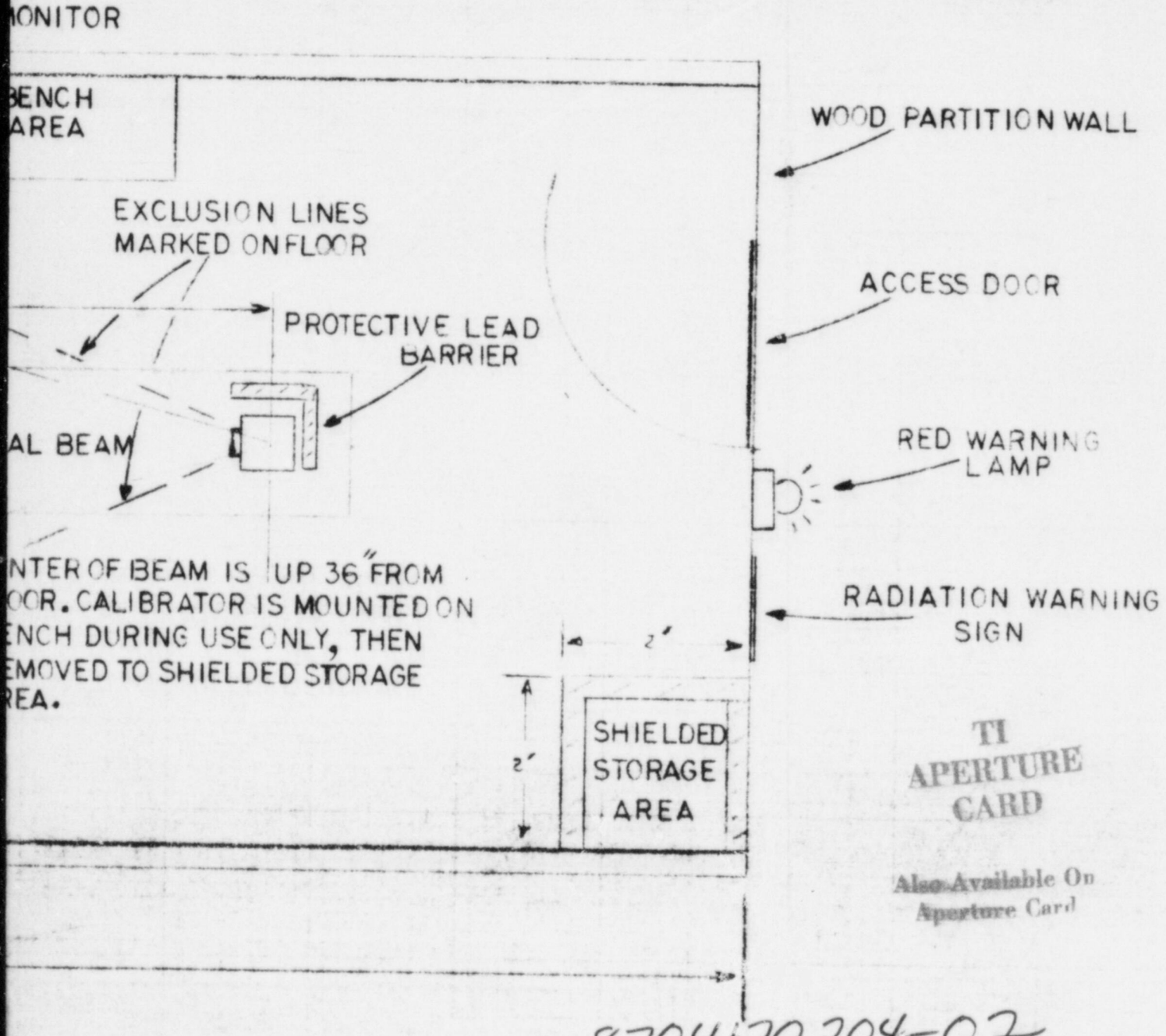
REV. "0" 4-1-81


8" CONCRETE BLOCK WALL
RADIATION M
SC-
79
CALIBRATION BENCH
30° CONIC
10.5" x 12' AREA
LEAD SHIELDED CEILING
12"
23'
12" POURED CONCRETE WALL

NUCLEAR INSTRUMENT CO.

INSTRUMENT CALIBRATION ROOM

REVISION "0" 4-1-81



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