NRC FORM 313
(1 84)
10 CFR 30, 32, 33, 34, 35 and 40

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3150-0120
Expires 5 31 87

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*)

- [X] A. NEW LICENSE
- [ ] B. AMENDMENT TO LICENSE NUMBER _____
- [ ] C. RENEWAL OF LICENSE NUMBER _____

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

Northeast Nuclear Energy Company
P.O. Box 270
Hartford, CT 06141-0270

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

Northeast Nuclear Energy Company
Millstone Nuclear Power Station, Unit No. 3.
Rope Ferry Road (Route 156)
Waterford, CT 06385

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Carol J. Crockett

TELEPHONE NUMBER: (203) 665-3285

SUBMIT ITEMS 5 THROUGH 11 ON 8½ 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: See Attached Text

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED: See Attached Text

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE: See Attached Text

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS: See Attached Text

9. FACILITIES AND EQUIPMENT: See Attached Text

10. RADIATION SAFETY PROGRAM: See Attached Text

11. WASTE MANAGEMENT: See Attached Text

12. LICENSEE FEES (*See 10 CFR 170 and Section 170.31*)
FEE CATEGORY: Exempt
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
J. F. Opeka	J. F. Opeka	Senior Vice President	

14. VOLUNTARY ECONOMIC DATA

a. ANNUAL RECEIPTS

- [ ] < $250K
- [ ] $250K – 500K
- [ ] $500K – 750K
- [ ] $750K – 1M
- [ ] $1M – 3.5M
- [ ] $3.5M – 7M
- [ ] $7M – 10M
- [X] > $10M

b. NUMBER OF EMPLOYEES (*Total for entire facility excluding outside contractors*): 9,100

c. NUMBER OF BEDS: N/A

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.*)

- [X] YES
- [ ] NO

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS	APPROVED BY
APP	Aug-18-1	EX	FEE EXEMPT 170.11(a)(3)	

AMOUNT RECEIVED	CHECK NUMBER	DATE
		8/27/85

8510310579 850930
REG1 LIC30
06-13937-01 PDR

NORTHEAST NUCLEAR ENERGY COMPANY
MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3
Application for a Type A License of
Broad Scope for By-Product Material

GENERAL INFORMATION

Pursuant to 10 CFR Part 30 and Part 33 Northeast Nuclear Energy Company, et. al.,* hereby applies for a Type A License of Broad Scope for By-Product Material for Millstone Nuclear Power Station, Unit No. 3, Docket No. 50-423. The activities sought to be authorized are the receipt, possession, storage, and use of by-product radionuclides for the purposes consistent with supporting the start-up, operational control and emergency response capability of a 1,150 MW pressurized light water reactor. Northeast Nuclear Energy Company is the holder of Construction Permit No. CPPR-113 issued by the Atomic Energy Commission on August 9, 1974. CPPR-113 permits construction of Millstone Unit No. 3 in the Town of Waterford, New London County, Connecticut, on the north shore of Long Island Sound.

* Northeast Nuclear Energy Company acts as agent and representative for the following owners: The Connecticut Light and Power Company; Western Massachusetts Electric Company; New England Power Company; The United Illuminating Company; Public Service Company of New Hampshire; Central Vermont Public Service Corporation; Montaup Electric Company; City of Burlington, Vermont, Electric Light Department; Chicopee Municipal Lighting Plant; Massachusetts Municipal Wholesale Electric Company; Vermont Electric Generation and Transmission Cooperative, Inc.; Central Maine Power Company; Village of Lyndonville Electric Department; Connecticut Municipal Electric Energy Cooperative; and Fitchburg Gas and Electric Light Company.

FORWARD

Northeast Utilities owns and operates the following nuclear generating facilities:

	Connecticut Yankee	Millstone 1	Millstone 2	Millstone 3
Type:	PWR	BWR	PWR	PWR
Fuel Load:	July 1967	Nov. 1970	Aug. 1975	Nov. 1985
Commercial Operation:	Jan. 1968	Dec. 1970	Dec. 1975	May 1986
Current Capacity:	582 MW	660 MW	870 MW	1,150 MW
Ownership:	NU - 44%	NU - 100%	NU - 100%	NU - 64.85%

Millstone Unit No. 3, as part of Millstone Station (Unit Nos. 1, 2, and 3), will utilize "station common" policies and procedures where applicable (i.e., administrative procedures, safety procedures, emergency response procedures, etc.). Specific to this license application, the following Millstone Unit No. 3 departments: Health Physics, Chemistry, Instrument and Control, A.L.A.R.A. Section, and Rad Waste Departments will control various check sources and calibration sources received under this applied for by-product license, consistent with the uses and practices established in the operating units (i.e., Millstone Unit Nos. 1 and 2).

The attached Type A By-Product Material License of Broad Scope application submitted herein for Millstone Unit No. 3 is presented in the format of Regulatory Guide 10.5, Revision 1, 1980 using NRC Form 313 with proposed Regulatory Guide 10.5, Revision 2 errata sheet guidance, provided by the NRC.

Specific questions on this license application should be directed to:

1. C. J. Crockett (203) 665-3285
2. J. P. Kangley (203) 444-4211

5. RADIOACTIVE MATERIAL

(a) Element and Mass Number

Millstone Unit No. 3 requests to be granted a Type A License of Broad Scope in accordance with Regulatory Guide 10.5 for by-product materials (reactor produced radionuclides having atomic numbers 1 through 83) and small quantities (< 5 uCi/source) of Pu-239, and depleted uranium plaques (> 98% U-238). Also requested under this license is a total of 6 curies of Am-241 to be used as neutron instrumentation check sources.

(b) Chemical and Physical Form

The chemical and physical form of by-product material required by Millstone Unit No. 3 is any by-product material between atomic numbers 1 through 83, and Pu-239, Am-241 and depleted natural uranium which can exist in the physical state of solids, liquids, and gases. These calibration and check sources can be button disc sources, liquid source compositions or by-product gases encapsulated in pressure cylinders. All material with atomic numbers greater than 83 (i.e., Pu-239, Am-241) will be in solid form such as a plated and/or double encapsulated structural source configuration.

Examples of Source Material - Physical State and Composition

Source Description	Typical Curie Quantity	Use
A. Solid		
Button Source	12 uCi Cs-137	Source check HP gamma instrument
Plated Source	0.1 uCi Pu-239	Source check HP alpha instrument
B. Liquid	1 E-4 uCi/ml Co-60 1000 mls	Response check multichannel analyzer
C. Gases	400 nCi Kr-85	Response check chemistry effluent monitor

(c) Maximum Amount Which Will be Possessed at Any One Time

Millstone Unit No. 3 requests a by-product license authorizing the possession of a total of 415 curies of by-product material having atomic numbers 1 through 83, 6 curies of Am-241, and .000030 curies combined activity of Pu-239 and natural depleted uranium plaques.

Isotope	Maximum Quantity Processed
Atomic Numbers 1 - 83	415 curies
Am-241	6 curies
Pu-239 and Natural Uranium (>98% U-238)	.000030 curies

The single largest quantity of byproduct material will be contained in a J. L. Shepherd 89-400 Cesium-137 calibrator. This nuclear industry-standard calibration devise contains a nominal 400 curie Cs-137 check source. Attached to this application are J. L. Shepherd (Glendale, California) manufactures notes and information on this equipment (Reference 1).

The remainder of Millstone Unit No. 3 byproduct material will be in the form of small check sources and calibration sources (button sources, liquid sources, gas sources).

6. PURPOSES FOR WHICH MATERIAL WILL BE USED

Millstone Unit No. 3 will utilize by-product material between atomic numbers 1 and 83 and Pu-239, Am-241 and natural depleted uranium plaques for industrial uses in calibration, response checking, monitoring, surveying, assaying, and measuring of Health Physics instrumentation, Chemistry instrumentation, and Instrument and Control (I&C) instrumentation. These uses of by-product material are consistent with the start-up, operational control and emergency response capability of a 1,150 MW commercial electric generating power plant. As previously stated, Millstone Unit No. 3, as the fourth nuclear generating station operated by Northeast Utilities, will use by-product material consistent with the uses and practices established in the operating units (Connecticut Yankee, Millstone Unit No. 1, Millstone Unit No. 2).

7. INDIVIDUALS RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE

The key positions having radiation safety responsibilities for Millstone Unit No. 3 are listed below. The listing shows Millstone Station radiation control personnel exclusively. Additional key personnel supporting radiation safety activities are centered in the corporate Radiological Assessment Branch in Berlin, Connecticut.

Millstone Unit No. 3 Radiation Safety Personnel

Radiological Services Supervisor
Health Physics Supervisor
Radiation Protection Supervisor - Operations
Radiation Protection Supervisor - Support
Assistant Radiation Protection Supervisor
Health Physicist

The Health Physics Supervisor is considered the Radiation Safety Officer (i.e., Chairman of the radiation safety committee as described in Regulatory Guide 10.5) for the use of by-product material at Millstone Unit No. 3. The training, experience, qualifications, and job description of the Health Physics Supervisor appears in this section. The other above listed Millstone Unit No. 3 radiation safety personnel comprise the "safety committee" as described in Regulatory Guide 10.5. The training, experience, qualification, and job description of these personnel is also listed in this section.

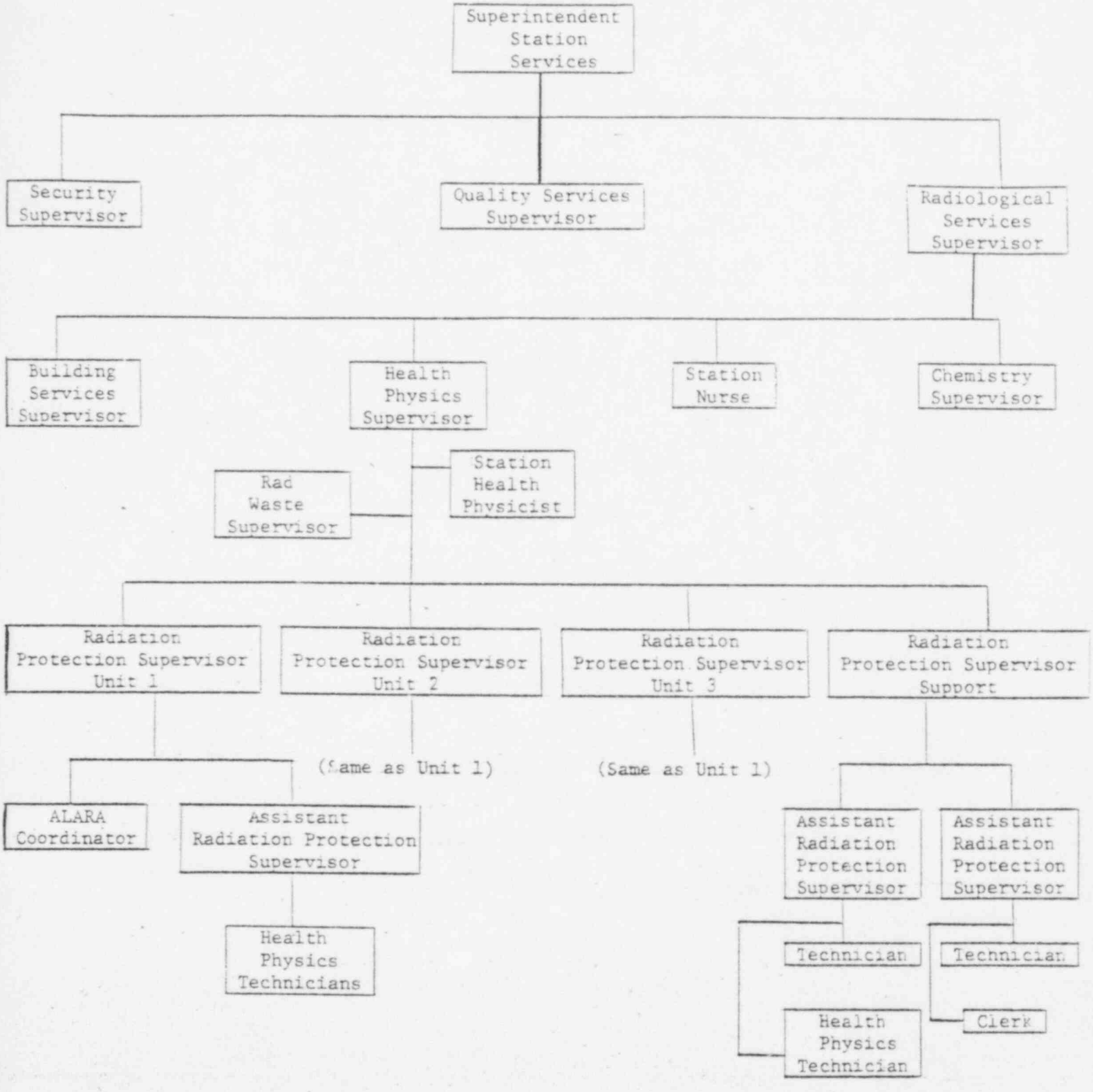


FIGURE 13.1-8 (SHEET 3 OF 3)
NNECo. DEPARTMENTS
RADIOLOGICAL SERVICES
MILLSTONE NUCLEAR POWER STATION
UNIT 3
FINAL SAFETY ANALYSIS REPORT

TRAINING, EXPERIENCE, AND TECHNICAL QUALIFICATIONS FOR ONSITE RADIATION CONTROL PERSONNEL

John P. Kangley - Radiological Services Supervisor

Where Trained	Duration	On the Job	Formal Course
Connecticut Yankee	10.8 yrs.	Yes	Yes
Millstone Nuclear Power Station	5.2 yrs.	Yes	Yes

Experience With Radiation

Isotope	Max. Amount	Where Gained	Duration	Type of Use
Co-60	6.18 mCi	Connecticut Yankee	10.8 yrs.	Calibration
Am-241	4 Ci	Connecticut Yankee	10.8 yrs.	Calibration
Cs-137	50 Ci	Connecticut Yankee	10.8 yrs.	Calibration
Cs-137	130 mCi	Millstone Station	5.2 yrs.	Calibration
Cs-137	260 Ci	Millstone Station	5.2 yrs.	Calibration
Am-241	5.8 Ci	Millstone Station	5.2 yrs.	Calibration
Cs-137	120 mCi	Millstone Station	0.5 yrs.	Calibration

J. P. Kangley, Radiological Services Supervisor

EDUCATION:

BS in Chemistry, St. Francis Xavier University, 1965.

EXPERIENCE:

1965-1969

Math and Science Teacher, Mt. St. John School.

1969-1976

Connecticut Yankee Atomic Power Company, Haddam Neck Plant.
Chemist

1970-1975

Connecticut Yankee Atomic Power Company, Haddam Neck, alternate to the Chemistry/Health Physics Supervisor (Department Head). Responsible for overall supervision of the department during supervisor's absence.

Connecticut Yankee Atomic Power Company, Haddam Neck, alternate to the Health Physicist. Responsible for the radiation protection program and supervision of the Chemistry and Health Physics technicians during supervisor's absence. Assigned special projects and duties within the radiation protection group such as supervision of spent fuel shipments, disposal of high-level spent resin liners, and special decontamination projects. Part of the department review group which evaluated and made recommendations for the improvement of the radiation protection program. Supervised chemistry and radiation protection activities during the evening shift for the major shutdowns/refueling outages from 1970 to 1976. Assisted the Health Physics Supervisor during the day shift refueling outages of 1977 and 1979.

1976-1980

Connecticut Yankee Atomic Power Company, Haddam Neck, Chemistry Supervisor. 'Responsible for overall supervision of the Chemistry Department.

1980-1982

Millstone Nuclear Power Station, Chemistry Supervisor. Responsible for overall supervision of the Chemistry Department for all three units.

1982-Present

Millstone Nuclear Power Station, Radiological Services Supervisor. Plans, schedules, coordinates, and provides overall supervision for Radiological Services consisting of radiation protection, chemistry, medical facility, radioactive material handling, building services, and emergency planning in compliance with applicable Federal, State, and Corporate rules and regulations.

J. P. Kangley (cont.)

TRAINING:

Basic Radiation Health, U. S. Public Health Service	80 hours 1970
Gamma Nuclide Analysis, U. S. Public Health Service	80 hours 1971
Minority Sensitivity Workshop, N.U.	16 hours 1975
Principles of Effective Supervision, N.U.	40 hours 1976
Put it in Writing, N.U.	20 hours 1978
Performance Review Workshop, N.U.	8 hours 1982
Transactional Analysis, N.U.	28 hours 1982
HP Phase II Training, Wedlicks Educational Development/N.U.	40 hours 1981
HP Phase II Training, University of Lowell/N.U.	40 hours 1982
HP Phase II Training, University of Lowell/N.U.	40 hours 1983
HP Phase II Training, University of Lowell/N.U.	40 hours 1984
Mitigation of Core Damage, Unit I, N.U.	8 hours 1980
Mitigation of Core Damage, Unit II, N.U.	40 hours 1980
Senior Reactor Operator School & Simulator, CE/N.U.	2920 hours 1979-80
Radwaste - 10 CFR 61 Regulations	8 hours 1983
Sexual Harassment	4 hours 1983

Benito L. Granados - Health Physics Supervisor

Where Trained	Duration	On the Job	Formal Course
General Dynamics/ Electric Boat Div.	15 yrs.	Yes	Yes
Connecticut Yankee	1.25 yrs.	Yes	Yes
Millstone Nuclear Power Station	3.5 yrs.	Yes	Yes

Experience With Radiation

Isotope	Max. Amount	Where Gained	Duration	Type of Use
Co-60	300 mCi	Electric Boat Div.	15 yrs.	Calibration
Co-60	100 Ci	Electric Boat Div.	15 yrs.	Radiograph
Ir-192	100 Ci	Electric Boat Div.	15 yrs.	Radiograph
Pu Be	5 Ci	Electric Boat Div.	15 yrs.	Calibration
Co-60	6.18 mCi	Connecticut Yankee	1.25 yrs.	Calibration
Am-241	4 Ci	Connecticut Yankee	1.25 yrs.	Calibration
Cs-137	50 Ci	Connecticut Yankee	1.25 yrs.	Calibration
Cs-137	130 mCi	Millstone Station	3.5 yrs.	Calibration
Cs-137	260 Ci	Millstone Station	3.5 yrs.	Calibration
Am-241	5.8 Ci	Millstone Station	3.5 yrs.	Calibration
Cs-137	120 mCi	Millstone Station	0.5 yrs.	Calibration

Benito L. Granados, Jr., Health Physics Supervisor

EDUCATION:

Norwich Public School System, Norwich, Connecticut
Norwich Free Academy, Norwich, Connecticut
University of Connecticut, Storrs, Connecticut (3 years)
Post College (currently enrolled)

Electric Boat Schools

S5W Nuclear Propulsion
S6G Nuclear Propulsion
Instructor Training Course

Northeast Schools

See Attachment

EXPERIENCE:

1953-1954

University of Connecticut. Student.

1954-1958

United States Marine Corps

1958-1960

University of Connecticut. Student.

1960-1965

Dow Chemical Company. Latex and styrofoam production.

1965-1970

Rad Con Monitor, Rad Con Operations, EB Division of General Dynamics, Groton, Connecticut.

Responsibilities:

1. Performed radiological control during submarine overhaul.

Benito L. Granados, Jr., (cont.)

1970-1972

Engineering Assistant, Rad Con Operations Engineering, EB Division of General Dynamics

Responsibilities:

1. Prepared exposure estimates, work procedures, shielding procedures and overhaul reports.

2. Operations Engineer/Rad Con Foreman for USS Trepang PSA.

1972-1976

Engineering Assistant, Nuclear Construction Engineering, EB Division of General Dynamics

Responsibilities:

1. Preparation of working procedures for repairs to nuclear piping systems.

1976-1977

Sr. Engineering Assistant, Rad Con, Shippingport, PA, EB Division of General Dynamics

Responsibilities:

1. Assisted Rad Con Manager.

2. Supervised Rad Con operations engineering and administration sections.

3. Supervised the radiological tranining of all personnel on site.

4. Liaison between Electric Boat, Westinghouse, and Duquesne Light Company.

1977-1979

Sr. Engineering Assistant, Rad Con Training/Planning, EB Division of General Dynamics

Responsibilities:

1. Planning, execution and critiques of shipyard Nuclear Accident Drills.

2. Assist in training of Rad Con monitors.

Benito L. Granados, Jr., (cont.)

3. Rad Con Shield Survey Coordinator (Liaison between) Nuclear Test, Rad Con, non-nuclear departments and Construction Engineering).

4. Special assignment to Duquesne Light Company, Shippingport, PA, to train personnel in preparation of working procedures involving radioactive material.

1979-1980

Consultant, Reactor Plant Services, EB Division of General Dynamics

Responsibilities:

1. Assisted in re-organization of CY H.P. Department.

2. Acted as CY H.P. Supervisor during absence of CY H.P. Supervisor.

3. Member of CY PORC.

4. Responsible for several vendor contractors.

5. Ordered and staged equipment and consumables for refueling outage.

1980-1981

Radiation Protection Supervisor
Connecticut Yankee Atomic Power Company

Responsibilities:

1. Supervise Health Physics operations, services and radwaste groups.

2. During refueling outage directly supervise over 200 Health Physics personnel both inhouse and vendors.

3. Member of Plant PORC.

4. Member of Plant Safety Committee.

5. Involved with Emergency Planning.

6. Ensure that there are adequate supplies on station at all times to support emergency shutdowns.

7. Responsible for respirator man-fit and testing.

Benito L. Granados, Jr., (cont.)

1981-present

Health Physics Supervisor
Northeast Nuclear Energy Company, Northeast Utilities

Responsibilities:

1. Supervise Health Physics for Units 1, 2, & 3 approximately 40 personnel.
2. Ensure that there are adequate supplies and manpower on station to support normal and emergency work.
3. Supervise 200 personnel during refueling shutdowns.
4. Responsible for external and internal exposures for entire site.
5. Responsible for respirator protection for all personnel at Millstone.
6. Responsible for training of Health Physics technicians.
7. Preparing, reviewing and revising Health Physics procedures.
8. Preparing reports required by applicable State and Federal Regulations.
9. Receipt, storage, use and shipment of radioactive material.
10. Responsible for radiological emergency equipment.
11. Responsible for personnel dosimetry program.
12. Responsible for isotopic identification and MPC calculations.
13. Meet with NRC/State auditors during Health Physics inspections.
14. Maintain and calibrate an adequate number of Health Physics survey and Laboratory instrumentation.

TRAINING & SEMINARS WHILE AT NORTHEAST UTILITIES:

1. Turco Ultrasonics Cleaning Seminar
2. Atcor/Belgonucleaire Seminar on Rad Waste Solidification
3. N.U. Overview - Organization & Operations
4. Efficient Reading
5. Primary Management of Radiation Injury (Chicago, Ill.)

Benito L. Granados, Jr., (cont.)

6. Principles of Effective Supervision

7. Effective Listening

8. Planning & Conducting Effective Meetings

9. Radioactive Material Packaging, Transportation & Disposal Workshop (Columbia, S.C.) 1/13-1/15/81

10. Problem Solving & Decision Making

11. Mitigating Reactor Core Damage
3/2/81 - 3/6/81 (Conn. Yankee; Gen. Physics Corp.)

12. Health Physics Training Phase II
3/16/81 - 3/26/81 (Berlin)
Harry Wedlick - Wedlicks Educational Dev. in Systems Safety

13. Written Communications

14. Scott Air-Pak Training Seminar, Lancaster, NY 5/3-5/6/81

15. Time Management

16. University of Lowell, Phase II Health Physics Training 1982, 1983, 1984

John C. Sullivan - Station Health Physicist

Where Trained	Duration	On the Job	Formal Course
University of Lowell Lowell, Mass.	3 yrs.	Yes	Yes
Clinical Assays Cambridge, Mass.	2.5 yrs.	Yes	No
M.I.T. - Bates Linear Accelerator Middletown, Mass.	0.5 yrs.	Yes	No
M.I.T. - Research Reactor Cambridge, Mass.	1 yr.	Yes	No
Northeast Utilities Berlin/Millstone Station	1.8 yr.	Yes	Yes

Experience With Radiation

Isotope	Max. Amount	Where Gained	Duration	Type of Use
I-125	200 mCi	Clinical Assays	2.5 yrs.	Production
Cs-137	30 Ci	MIT (Bates Lab)	0.5 yrs.	Calibration
Cs-137	10 Ci	MIT (Reactor)	1 yr.	Calibration
Cf-252	6 mCi	MIT (Reactor)	1 yr.	Calibration
Pu-238/Be	1 Ci	MIT (Reactor)	1 yr.	Calibration
Ra-226	100 mCi	MIT (Reactor)	1 yr.	Calibration
Cs-137	130 mCi	Millstone Station	1.8 yrs.	Calibration
Cs-137	260 Ci	Millstone Station	1.8 yrs.	Calibration
Am-241	5.8 Ci	Millstone Station	1.8 yrs.	Calibration
Cs-137	120 mCi	Millstone Station	0.5 yrs.	Calibration

John C. Sullivan, Millstone Station Health Physicist

EDUCATION:

Saugus High School, Saugus, Massachusetts - 6/69
BA - Biology, Salem State College, Salem, Massachusetts - 12/76
MS - Radiological Science, University of Lowell, Lowell, Massachusetts - 5/83

EXPERIENCE:

5/77 - 8/79

Research Associate, Damon Diagnostics, Damon Corporation, Needham, Massachusetts.

Responsibilities: Technical Coordinator for the clinical trials for a test used for detection of cancer. Troubleshooting and overseeing all testing. Consulting with and training technicians. Iodination technique utilized for development of radioimmunoassay.

8/79 - 1/82

Health Physicist, Clinical Assays, Cambridge, Massachusetts.

Responsibilities: Maintain and upgrade a Radiation Safety Program geared to mCi usage of ^{125}I and uCi quantities of ^{57}Co and ^{3}H. Maintain compliance with Part 20--Standards for Radiation Protection. Generated and recorded all data pertaining to: personnel exposure; air surface, area monitoring; isotope inventory; waste disposal; instrument calibration. Supervised radiation protection efforts of three "Hot Labs" including a tracer production facility and two research labs.

Instituted the following programs:

ALARA program for controlling exposure and exhaust effluents.

Company wide health physics training programs to meet needs of various technical levels.

Radiation Lab Supervisors to oversee all health physics procedures in respective labs.

Control of Tracer bottling lines to insure product integrity.

Provided an assistant with daily responsibilities.

Researched air sampling techniques and charcoal filtration of aqueous radioactive solutions.

1/82 - 8/82

Health Physics Consultant, Clinical Assays, Cambridge, Massachusetts.

Responsibilities: Train new radiation protection personnel. Oversee H.P. Program including filing licenses and reports to NRC and FDA.

John C. Sullivan, (cont.)

1/82 - 5/82

Health Physics Technician, Bates Linear Accelerator, M.I.T., Middleton, Massachusetts.

Responsibilities: Oversee research and staff activities which involve use of 400 MEV electron accelerator. Performed routine radiation surveys. Maintained accelerator security system.

6/82 - 5/83

Health Physics Technician, Massachusetts Institute of Technology Research Reactor, M.I.T., Cambridge, Massachusetts.

Responsibilities: Shift technician for a 5 megawatt tank type reactor. Routine monitoring required use of the following equipment: Analytical--NaI and GeLi multi-channel analyzers, Gas Flow Proportional and Liquid Scintillation Counters; Survey--Scintillation, GM, Ion Chambers, BF_3, Bonner sphere; Particulate and Gas Monitors. Calibration of all above. Calibration of LiF Thermoluminescent Dosimetry (TLD) Program for determining dose due to gamma, beta and neutron radiation. Analyzed the reactor's leakage neutron spectrum and resultant dose equivalent rate via the Multisphere Technique and Bonner Unfolding Code.

6/83 - 11/83

Associate Scientist, Radiological Assessment Branch, Northeast Utilities Service Co., Berlin, Connecticut.

Responsibilities: Upgrading training programs and conducting training for plant Health Physics technicians. Auditing the Millstone and Connecticut Yankee Nuclear Plants to assure compliance with corporate Health Physics guidelines and 10 CFR 20.

12/83 - Present

Health Physicist, Northeast Nuclear Energy Co., Waterford, Connecticut.

Responsibilities: Provide engineering and technical support to the Health Physics Department for an operating PWR and BWR. Oversee Internal Dosimetry Program, personnel contamination and control. Assure equipment is state-of-the-art and that an adequate personnel monitoring program is maintained.

Project leader for cut up and shipment of Unit 2 Thermal Shield. Dictated to crafts and support groups, radiological precautions to be taken during the 10 month evolution. Interface with corporate Radiological Engineering.

PROFESSIONAL AFFILIATIONS:

National, New England, and Connecticut Chapters of Health Physics Society.

John C. Sullivan, (cont.)

TRAINING:

Radwaste Shipping Regulations, Federal Express	32 hours 1979-80
Quality Assurance Auditing Principles, Gilbert/Commonwealth	40 hours 1983
Phase II Training, NU	40 hours 1983
Phase II Training, NU	40 hours 1984
Radioactive Shipping and Packing Seminar, NUS	32 hours 1984

Ronald J. Sachatello - Radiation Protection Supervisor - Operations

Where Trained	Duration	On the Job	Formal Course
General Dynamics/ Electric Boat Div.	10 yrs.	Yes	Yes
Connecticut Yankee	1 yr.	Yes	Yes
Millstone Nuclear Power Station	2.5 yrs.	Yes	Yes

Experience With Radiation

Isotope	Max. Amount	Where Gained	Duration	Type of Use
Co-60	300 mCi	Electric Boat Div.	10 yrs.	Calibration
Co-60	100 Ci	Electric Boat Div.	10 yrs.	Radiograph
Ir-192	100 Ci	Electric Boat Div.	10 yrs.	Radiograph
Pu-Be	5 Ci	Electric Boat Div.	10 yrs.	Calibration
Am-241	3 Ci	Electric Boat Div.	10 yrs.	Calibration
Cs-137	50 Ci	Connecticut Yankee	1 yr.	Calibration
Am-241	4 Ci	Connecticut Yankee	1 yr.	Calibration
Cs-137	130 mCi	Millstone Station	2.5 yrs.	Calibration
Cs-137	260 Ci	Millstone Station	2.5 yrs.	Calibration
Am-241	5.8 Ci	Millstone Station	2.5 yrs.	Calibration
Cs-137	120 mCi	Millstone Station	0.5 yrs.	Calibration

Ronald Sachatello - Millstone 3 Rad. Protection Supervisor

EDUCATION:

New London High School, New London, Connecticut	1960-1964
Lycoming College, Williamsport, Pennsylvania	1964-1968 (BA) Biology
Southern Connecticut State College, New Haven, CT	1970-1977 (MS) Biology

MILITARY:

U. S. Army, July 1968 - July 1970 - Honorable Discharge (Intelligence Analyst)

EXPERIENCE:

1972-1981

GENERAL DYNAMICS/ELECTRIC BOAT DIVISION (1972 - 1981)

Radiological Control Training and Planning Supervisor (1979-1981)

(A) Directed EB Division Rad Foreman/HP Tech & Shipyard TLD Qualification Program
(B) Nuclear Reactor Emergency Drill Writer/Critique Evaluator
(C) General Dynamics/EB Division Radiological Legal Claims Defense Member

Special Note: Served in capacity as the Emergency ALARA Representative for TMI Unit II, 3/31/79-5/79

Radiological Control Shift Supervisor (1977-1979)

(A) On-shift ALARA representative
(B) Technical advisor to EB Division management in Nuclear Reactor Accident

Radiological Engineer (1974-1977)

(A) Prepare/conduct in-depth radiological audits
(B) Inspect, audit, evaluate in progress radiological evolutions

Radiological Control Monitor (I/C) (1972-1974)

(A) Monitor shipyard radiological control
(B) Qualified to NAVSHIPS 389-0288, Article 108

1981-1982

NORTHEAST UTILITIES (1981 - 1985)

Health Physicist, Connecticut Yankee Atomic Power Company (1981 - 1982)

(A) Performed radiological control technical evaluations
(B) Prepared/conducted emergency preparedness training

1982-1983

Health Physicist, Millstone Nuclear Power Station (1982 - 1983)

Ronald Sachatello - Millstone 3 Rad. Protection Supervisor

Radiation Protection Supervisor, Millstone Nuclear Power Station (1983 - 1985)

(A) Supervised Unit II Thermal Shield Removal HP Activities
(B) Performed Unit II Steam Generator Radiation Analysis
(C) HP Control of Unit 1 Recirculation Piping System Chemical Decontamination

RECENT SYMPOSIUMS:

Mid Year Health Physics Symposium-Hyannis, MA	40 hours 1980
Effects of Low-Level Radiation-Yale University	8 hours 1981
Proposed Changes to 10 CFR 20-Amherst College	8 hours 1981

PROFESSIONAL SOCIETIES:

National Health Physics Society

TRAINING:

GENERAL DYNAMICS

1972 Rad Con Monitoring - Initial Qualification Course	(1600 hrs.)
1977 Rad Con Instructor Training Course	(80 hrs.)
1977 S5W Westinghouse Reactor Plant Course	(160 hrs.)
1978 S6G General Electric Reactor Plant Course	(80 hrs.)
1979 S8G General Electric Reactor Plant Course	(80 hrs.)
1978 Rad Con Supervisor Qualification Course	(80 hrs.)
1981 Middle Management Development	(160 hrs.)

NORTHEAST UTILITIES

1982 Canberra Multichannel Gamma Spectrometer Analysis	40 hrs.
1983 Canberra Whole Body Counter Chair Utilization	40 hrs.
1982 Berlin Phase II Training	40 hrs.
1983 Berlin Phase II Training	40 hrs.
1984 Berlin Phase II Training	40 hrs.
1984 Millstone Unit III Systems	120 hrs.

Frank T. Perry - Assistant Radiation Protection Supervisor

Where Trained	Duration	On the Job	Formal Course
General Dynamics/ Electric Boat Div.	12.5 yrs.	Yes	Yes
Millstone Nuclear Power Station	3.5 yrs.	Yes	Yes

Experience With Radiation

Isotope	Max. Amount	Where Gained	Duration	Type of Use
Co-60	300 mCi	Electric Boat Div.	12.5 yrs.	Calibration
Co-60	100 Ci	Electric Boat Div.	12.5 yrs.	Radiograph
Ir-192	100 Ci	Electric Boat Div.	12.5 yrs.	Radiograph
Pu-Be	5 Ci	Electric Boat Div.	12.5 yrs.	Calibration
Am-241	3 Ci	Electric Boat Div.	12.5 yrs.	Calibration
Cs-137	130 mCi	Millstone Station	3.5 yrs.	Calibration
Cs-137	260 Ci	Millstone Station	3.5 yrs.	Calibration
Am-241	5.8 Ci	Millstone Station	3.5 yrs.	Calibration
Cs-137	120 mCi	Millstone Station	0.5 yrs.	Calibration

Frank T. Perry, Millstone 3 Asst, Rad. Protection Supervisor

EDUCATION:

New London High School, New London, Connecticut - 1966
Mitchell College, New London, Connecticut - 1968

EXPERIENCE:

3/69 - 9/81

General Dynamics - Electric Boat Division

Chronological Review:

1. Rad Con Foreman 1981
2. Reactor Plant Services Engineering Assignment 1980-1981
3. Rad Environmental Engineering Assignment 1978-1979
4. Rad Con Monitor Working Leader 1974-1981
5. Rad Engineering Assignment 1973-1975
6. Rad Con Monitoring (I/C) 1969-1974

Responsibilities:

1. Supervise 32 Rad Con Monitors.
2. Evaluating adequacy of radiological controls in accordance with requirements of NAVSHIPS 389-0288 and EB Division Procedures.
3. Review radiological work evolutions and associated paperwork.
4. Assignment of personnel (RCMs, trainees) to jobs in progress.
5. Liaison between shipyard construction management, Ship's Force and Naval Reactors representatives relative to projected work scope/radiological requirements.
6. Review of radiological surveys for technical documentation.
7. Responsible for Radiological Material Accountability.

9/81 - 6/84

Northeast Utilities - Millstone Nuclear Station, Unit I Health Physics Technician

Duties include routine monitoring of radiological areas, personnel radiation control, and outage support.

6/84 - present

Northeast Utilities - Millstone Nuclear Station, Unit 3 Assistant Radiation Protection Supervisor

Current duties include writing procedures and initial setup for the unit Health Physics program, as well as, orientation and unit familiarization of the unit technicians.

Frank T. Perry, (con't.)

SIGNIFICANT WORK EXPERIENCE (1969-83)

I. High-Risk Radiological Coverage

Pressurizer Surge Line Modification
Loop Deon
Thermocouple Removal/Shipout Preparation
Check Valve/Stop Valve/Vessel Inspection
Resin Discharge/Removal/Shipout
Reactor Vessel Inspection
Steam Generator Probolog
Refueling/Defueling 1 for 1 and Core Basket
Nautilus Overhaul
Retention Tank Decon/Preservation

II. Rad Material Control

A. Rad Material Coordinator (173, 1981)

III. Environmental Program

A. Environmental Impact Statement Preparation (Quarterly/Annual) (1979-81)
B. Offsite Dosimetry Monitoring Program (1979-81)

IV. Dosimetry

A. Film Badge Administration (1969-71)
B. DIR Report Support

V. Procedure Development

A. ALARA (D-730) Curriculum Development (1980-81)
B. RPS (D-730) Radiological Work Practices Curriculum Development (1980-81)

VI. Instructor

RCM Trainee Instructor 1970-81
ALARA Containment/Shielding Instructor 1980-81

VII. Millstone Unit I Outage 1982

1. Drywell HP Supervisor - Refueling Outage 1982
2. Drywell HP Supervisor - Refueling Outage 1984

VIII. Millstone Unit II Outage 1983

1. Thermal Shield Removal Survey Evaluator

Frank T. Perry, (cont.)

TRAINING:

Rad Con Monitoring - Initial Qual. Course, Electric Boat	1600 hrs. 1969
Rad Con Instructor Training Course, Electric Boat	80 hrs. 1970
S5W Westinghouse Reactor Plant Course, E.B.	160 hrs. 1971
S6G General Electric Reactor Plant Course, E.B.	80 hrs. 1976
S8G General Electric Reactor Plant Course, E.B.	80 hrs. 1978
Rad Con Supervisor Qualification Course, E.B.	80 hrs. 1981
Phase I Qualification Course, N.U.	80 hrs. 1981
Phase I Retraining, N.U.	40 hrs. 1982
Phase I Retraining, N.U.	40 hrs. 1983
Phase I Retraining, N.U.	40 hrs. 1984
Millstone Unit 3 Systems, N.U.	120 hrs. 1984

Peter J. Simmons - Radiation Protection Supervisor - Support

Where Trained	Duration	On the Job	Formal Course
General Dynamics/ Electric Boat Div.	3 yrs.	Yes	Yes
Millstone Nuclear Power Station	7.5 yrs.	Yes	Yes

Experience With Radiation

Isotope	Max. Amount	Where Gained	Duration	Type of Use
Co-60	300 mCi	Electric Boat Div.	3 yrs.	Calibration
Co-60	100 Ci	Electric Boat Div.	3 yrs.	Radiograph
Ir-192	100 Ci	Electric Boat Div.	3 yrs.	Radiograph
Pu-Be	5 Ci	Electric Boat Div.	3 yrs.	Calibration
Cs-137	130 mCi	Millstone Station	7.5 yrs.	Calibration
Cs-137	260 Ci	Millstone Station	7.5 yrs.	Calibration
Am-241	5.8 Ci	Millstone Station	7.5 yrs.	Calibration
Cs-137	120 mCi	Millstone Station	0.5 yrs.	Calibration
Am-241	4 Ci	Connecticut Yankee	7.5 yrs.	Calibration

Peter J. Simmons - Radiation Protection Supervisor

EDUCATION:

Associate in Science Degree, Indian River Junior College, Ft. Pierce, Fla.

Attended Florida Atlantic University - 2 semesters.

EXPERIENCE:

9/74 - 9/77

General Dynamics Electric Boat, Radiological Control Monitor

9/77 - 1/80

Northeast Nuclear Energy Co., Unit I Health Physics Technician

1/80 - 3/82

Health Physics Technician Support Group

3/82 - 8/83

Assistant Radiation Protection Supervisor Support Group

8/83 - Present

Radiation Protection Supervisor Support Group

QUALIFICATIONS:

Completed S5W Reactor Plant Systems course at Electric Boat.

Complete 8080A Microprocessor course at Electric Boat.

Completed Radiation Protection Instrumentation course given by Eberline Instrument Corp.

Attended a 3 day seminar on Quantitative Man-fit Testing of Respiratory Apparatus using Sodium Chloride Test Aerosols offered by Dynatech Frontier Corp.

Attended a 3 day factory workshop at Air Pak II Maintenance and Overhaul course offered by Scott ATO Health and Safety Products

Attended a 2 day seminar on the Ping-3 Air Monitor.

Northeast Utilities Radiation Protection Technology Phase I & II.

Completed Canberra Ind. courses on Gamma Spectroscopy and Whole Body Counting.

Jon Firman - Health Physics Technician (Calibration)

Where Trained	Duration	On the Job	Formal Course
General Dynamics/ Electric Boat Div.	6 yrs.	Yes	Yes
Millstone Nuclear Power Station	5 yrs.	Yes	Yes

Experience With Radiation

Isotope	Max. Amount	Where Gained	Duration	Type of Use
Co-60	100 Ci	Electric Boat Div.	6 yrs.	Radiograph
Ir-192	100 Ci	Electric Boat Div.	6 yrs.	Radiograph
Pu-Be	5 Ci	Electric Boat Div.	6 yrs.	Radiograph
Cs-137	260 Ci	Millstone Station	5 yrs.	Calibration
Cs-137	130 mCi	Millstone Station	5 yrs.	Calibration
Am-241/Be	3 Ci	Connecticut Yankee	5 yrs.	Calibration
Am-241/Be	5.8 Ci	Millstone Station	5 yrs.	Calibration
Cs-137	116 mCi	Millstone Station	5 yrs.	Calibration
Pu-239	1.2 uCi	Millstone Station	5 yrs.	Calibration
Cs-137	120 mCi	Millstone Station	0.5 yrs.	Calibration

Danny Gorby - Health Physics Technician (Calibration)

Where Trained	Duration	On the Job	Formal Course
United States Navy Electric Boat Div.	8 yrs.	Yes	Yes
Millstone Nuclear Power Station	4 yrs.	Yes	Yes

Experience With Radiation

Isotope	Max. Amount	Where Gained	Duration	Type of Use
Cs-137	260 Ci	Millstone Station	4 yrs.	Calibration
Cs-137	130 mCi	Millstone Station	4 yrs.	Calibration
Am-241/Be	3 Ci	Connecticut Yankee	4 yrs.	Calibration
Am-241/Be	5.8 Ci	Millstone Station	4 yrs.	Calibration
Cs-137	116 mCi	Millstone Station	4 yrs.	Calibration
Pu-239	1.2 uCi	Millstone Station	4 yrs.	Calibration
Cs-137	120 mCi	Millstone Station	0.5 yrs.	Calibration

RESPONSIBILITIES OF KEY RADIATION SAFETY PERSONNEL

NORTHEAST UTILITIES

NU

EXEMPT
POSITION DESCRIPTION

36/791

PER3429-3 REV. 9-81

POSITION TITLE		GRADE	CODE
RADIOLOGICAL SERVICES SUPERVISOR			RSERSUP
REPORTS TO		DATE	FLSA CLASSIFICATION
STATION SERVICES SUPERINTENDENT		3/1/85	
GROUP	DEPARTMENT	SECTION	
NUCLEAR ENGINEERING AND OPERATIONS (NEO)	NUCLEAR OPERATIONS	STATION SERVICES	
LOCATION		APPROVED BY	
MILLSTONE STATION		W. C. Council	

THIS POSITION DESCRIPTION INCLUDES THE COMMON RESPONSIBILITIES LISTED ON THE REVERSE SIDE

POSITION SUMMARY

Plans, schedules, coordinates and provides overall supervision for radiological services at the Millstone nuclear facility to include: radiation protection, chemistry, medical facility, radioactive material handling, building services, and emergency planning, in compliance with applicable federal, state, and corporate rules and regulations.

PRIMARY DUTIES

1. Communicates with NRC officials and NU management on matters regarding station radiological services activities such as health physics, chemistry, radioactive material handling, station emergency plan, and the interpretation of rules and regulations as related to quality services.

2. Supervises the monitoring of the station radiation protection program to ensure that the activities of detection and control of radiation/contamination, the protection of personnel from radiation hazards, the control of health physics record and equipment are conducted in compliance with all applicable federal, state, and corporate rules and regulations.

3. Supervises the administration of the chemical and radiochemical control program, including performance evaluation of chemistry related systems and components to assure efficient operation of the units. Ensure corrective action is recommended to each unit.

4. Oversees the station Asbestos Control Program, Solvent Control Policy, and Air Quality Monitor Program.

5. Coordinates the occupational health services of the Station Medical Facility which includes routine medical exams, emergency treatment, follow-up care, and maintenance of reporting systems and records.

6. Provides for general housekeeping, minor building maintenance, low-level radioactive decontamination services, minor repair of doors and key lock mechanisms, snow and ice removal, surveillance

testing, and maintenance of fire protection equipment, distribution of protective clothing, and operation and maintenance of the respiratory decontamination facility.

7. Supervises the administration of a radioactive waste program that includes waste preparation, handling, packaging, and inspection in preparation for transporting for burial. Also, insures that handling, collection, and packaging is done such that it effectively reduces the volume of material shipped.

8. Supervises the implementation of a Station Emergency Plan including training, drills, procedure development, and testing and maintenance of equipment.

9. Provides the technical and engineering requirements to maintain radiation exposure "As Low As Reasonably Achievable" (ALARA) through procedure and work package review and providing engineering solutions to reduce radiation exposure.

10. Monitors industry policy, management, and organization trends by participating in industry meetings.

11. Prepares and directs the preparation of required reports, audit responses, and responses to NRC documents concerning assigned station services areas.

12. Verifies the establishment and execution of measures, policies, and procedures for the control of radiological related services through observation, reports, feedback of plant personnel, and review of audit reports.

13. Plans, coordinates, and assigns resources in assigned areas in support of unit refueling outages and major work activities as well as plant operation and startup of Millstone 3.

14. Coordinates the functions and activities of the Health Physics, Chemistry, Radiological Material Handling, Emergency Planning, and Medical Facility with the functional direction provided by similar departments and NUSCO.

15. Coordinates the preparation of the annual station operating budget for assigned departments. Oversees the expenditures of budgeted funds in the allocation of personnel resources and the procurement of material and services in assigned areas.

16. Advises on and oversees the administration of the ALARA program, Occupational Safety & Health Administration (OSHA) reporting requirements, Hazardous Waste Program, Breathing Air Monitoring Program, and Asbestos Control Program in accordance with corporate and applicable federal guidelines, audits, and inspections.

17. Monitors that adequate technical and regulatory training is provided for the radiological services function by verifying that established formal training programs have been implemented.

18. Maintains and updates appropriate station licenses and permits such as NRC by-product material license and South Carolina and Washington state radioactive waste shipping permit.

19. Serves as a member of the NU Radwaste Review Committee.

20. Conducts entrance and exit interviews with auditors and interacts with the NRC as required.

21. Prepares, delivers, and participates in presentations to senior management concerning outage plans, construction projects, and manpower and budget plans.

22. Serves as an alternate member of the Site Operations Review Committee and the Unit Plant Operations Review Committee.

23. Reviews and disseminates pertinent industry literature to assigned departments.

24. May act as Station Services Superintendent in his/her absence.

25. Serves as Manager of Radiological Dose Assessment during significant incidents requiring activation of the emergency organization.

26. Acts as designated Radiation Protection Manager for the station in fulfillment of NRC requirements.

ACCOUNTABILITY

1. Effective administration of a radiological protection and control program.

2. A properly staffed and trained health facility that meets the industrial safety needs of the station.

3. Proper storage, packaging, and shipment of radioactive waste with minimal impact on plant operation.

4. An effective and tested methodology of coping with nuclear emergencies that is coordinated with the plans of NUSCO and other involved outside agencies.

5. Timely and complete factual reports concerning the release of effluents, shipping of waste, reporting of exposures, and analysis of exposure incidents.

6. Up-to-date licenses and permits allowing continued long-term shipping of waste and continuation of plant operation.

7. Compliance of activities performed by the radiological services organization with applicable state, federal, and corporate rules and regulations.

8. Effective and sound contributions of the ALARA Committee.

9. A sound budget for the radiological services function including overseeing of expenses.

10. Assure that training for radiological services personnel is provided for.

AUTHORITY

1. Approve the station Medical Program for qualification of respiration protection users.

2. Recommend changes to procedures, policies, and programs concerning the radiological services organization.

3. Authorize radiation exposure in excess of normal station limits up to 2,000 millirem per quarter.

4. Recommend contractors and/or major equipment/programs for use by the radiological services organization such as selection of decontamination services, laundry services, and temporary health physics technician support for outages.

5. Approve requisitions and authorizations for payment for materials and services.

6. Authority to stop work due to radiological conditions or unacceptable health physics practices.

TYPICAL REQUIREMENTS (Minimum)

Training and Experience

1. Baccalaureate degree in engineering or physical science or the equivalent, with formal training in radiation protection.

2. Nine to eleven years related experience with a minimum of three years in applied radiation protection work in a nuclear facility dealing with radiological problems similar to those encountered at a nuclear station.

Knowledge/Skill

1. Maintain a thorough knowledge of federal and state regulatory requirements for radiation protection, radwaste shipping and handling, and radioactive chemical effluent discharges.

2. Basic technical knowledge in the area of nuclear engineering, instrumentation and control, chemistry, and radiation protection.

3. Working knowledge of planning/scheduling concepts and techniques, accounting concepts and rules, cost control, and cost accounting methods used by a utility.

4. Familiarity with NU Business Procedures, Accounting Manual and Retirement Unit Catalog.

5. Possess the ability to analyze information, determine facts, and make decisions accordingly.

6. Possess the ability to communicate and work effectively with various levels of the station and with counterparts in outside organizations.

7. Possess the ability to work in a nuclear power plant environment subject to the following: stress due to potential incidents/accidents, radiation exposure, search by security personnel, on-call restriction, interruption of personal life by telephone calls and radio pager messages, criticism by antinuclear groups, and potential civil penalties due to your own error or due to the errors of your staff.

8. Possess the ability to write clearly and concisely.

NORTHEAST UTILITIES

NU

EXEMPT
POSITION DESCRIPTION

PER3429-3 REV.9-81

36/260

POSITION TITLE		GRADE	CODE
RADIATION PROTECTION SUPERVISOR (OPERATIONS)			RADPROS
REPORTS TO		DATE	FLSA CLASSIFICATION
HEALTH PHYSICS SUPERVISOR		3/1/85	
GROUP NUCLEAR ENGINEERING AND OPERATIONS (NEO)	DEPARTMENT NUCLEAR OPERATIONS	SECTION STATION SERVICES	
LOCATION MILLSTONE/CONNECTICUT YANKEE STATIONS		APPROVED BY W. G. Counsil	

THIS POSITION DESCRIPTION INCLUDES THE COMMON RESPONSIBILITIES LISTED ON THE REVERSE SIDE

POSITION SUMMARY

Supervises personnel engaged in providing radiation protection for an assigned nuclear unit to include: verification of in-process work for radiation controls and Radiation Work Permits (RWPs) and coordination of radiation work activities with affected station departments.

PRIMARY DUTIES

1. Observes plant radiation areas on a routine basis; evaluates protective measures, corrects deficiencies and assures safety conformance.

2. Meets and discusses with management of Betterment Construction and unit department heads station/unit projects performed in radiologically controlled areas.

3. Supervises all aspects of the radiation monitoring and decontamination program for the assigned unit during routine and outage periods.

4. Develops for ANSI and NRC review comprehensive radiological requirements and procedures for such special projects as steam generator repair, thermal shield removal, recirculation system decontamination.

5. Serves as designated supervisor as specified in NRC Offsite By-product Materials License to manage off station HP related activities performed under this license.

6. Supervises the implementation of ALARA (As Low As Reasonably Achievable) programs at the assigned station. Reviews and approves application of established programs to ensure the station meets corporate ALARA goals.

7. Provides for review, testing, and evaluation of consumable supplies and protective devices required for in-plant protection.

8. Performs tours, answers queries, provides documentation, and shows compliance with federal regulations, technical specifications criteria, and HP program procedures in support of NRC, INPO, state and corporate HP visits/inspections.

9. Plans and schedules, as the Outage Coordinator, manpower and materials to support planned outages with respect to radiation protection. Reports and resolves any radiological critical-path hold points directly with the respective unit superintendent on a daily basis.

10. Schedules and anticipates manpower and materials for adequate radiological controls in support of immediate repairs resulting from forced outages.

11. Investigates, assesses, and develops a report detailing internal and external radiation events for station/corporate management and regulatory agencies.

12. Prepares and publishes legal documentation reports and special studies pertinent to in-plant radiological protection; submits same to station management, corporate personnel, and regulatory agencies as required.

13. Performs the duties of the Health Physics Supervisor in his/her absence.

14. Develops manpower and operations/maintenance expense budget data in support of the overall health physics budget. Monitors same and justifies variances from approved budget.

15. Supervises the implementation of on-the-job technical training as required for assigned personnel.

ACCOUNTABILITY

1. Appropriate actions to correct deficiencies identified during on-the-job surveillance.

2. Full coordination of radiological protection work projects with affected station heads and/or Betterment Construction.

3. Proper radiological protective and control measures such as shielding or decontamination in accordance with approved radiation practices and ALARA.

4. Effective response during NRC, INPO, state and corporate HP inspections/visits in matters pertinent to compliance and technical specifications.

5. Proper documentation of activities associated with the work.

6. Assure station compliance with ALARA programs, policies and procedures.

7. Effective supervision of assigned personnel.

8. Assure that radiation workers and HP personnel as assigned are properly job trained and qualified.

9. Timely and accurate reports of work activities to supervision.

10. Accurate, complete, and timely budget data input in support of overall HP budget.

AUTHORITY

1. Authority to stop work due to radiological conditions or unacceptable health physics practices and on the basis of personnel health and safety.

2. Authority to sign increased exposure authorizations up to 2000 mRem.

3. Authority to approve radiation work permits.

4. Authority to clear safety tagging in support of Health Physics Department activities.

TYPICAL REQUIREMENTS (Minimum)

Training and Experience

1. Baccalaureate degree in an engineering or science discipline, or equivalent.

2. Eight to ten years of related experience of which three years shall be at a nuclear power facility.

Knowledge/Skill

1. Extensive knowledge of station, state, and federal radiation protection regulations.

2. Ability to work effectively with various levels of the plant organization and with counterparts in the corporate and outside organizations.

3. Good verbal and written communication skills.

4. Strong supervisory skills including the ability to maintain high productivity.

5. In-depth knowledge of established health physics procedures.

6. Strong analytical skills as required for trouble shooting equipment malfunctions and developing problem resolutions.

7. Good knowledge of nuclear power plant operations with emphasis radiologically controlled areas.

NORTHEAST UTILITIES

NU

THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

EXEMPT
POSITION DESCRIPTION

PER3429-2 REV.9-81

36/800

POSITION TITLE		GRADE	CODE
HEALTH PHYSICS SUPERVISOR			HLPHYS
REPORTS TO		DATE	FLSA CLASSIFICATION
RADIOLOGICAL SERVICES SUPERVISOR (MILLSTONE) STATION SERVICES SUPERINTENDENT (CY)		3/1/85	
GROUP	DEPARTMENT	SECTION	
NUCLEAR ENGINEERING AND OPERATIONS (NEO)	NUCLEAR OPERATIONS	STATION SERVICES	
LOCATION		APPROVED BY	
MILLSTONE/CONNECTICUT YANKEE STATIONS		M. G. Counsil	

THIS POSITION DESCRIPTION INCLUDES THE COMMON RESPONSIBILITIES LISTED ON THE REVERSE SIDE

POSITION SUMMARY

Plans, coordinates, and provides overall supervision of radiation protection activities of an assigned nuclear power station to include: detecting and controlling radiation/contamination; maintaining and calibrating health physics equipment; maintaining a radiation exposure monitoring recording and reporting system; and preparing and disposing of radioactive waste (CY only).

PRIMARY DUTIES

1. Represents Station management during Nuclear Regulatory Commission (NRC), Institute of Nuclear Power Operations (INPO), state and corporate inspection visits/evaluations; directs the performance of tours, answering of queries, provision of documentation, and verification of compliance with federal regulations, Technical Specifications criteria, and Health Physics program procedures.

2. Supervises the internal and external radiation exposure control program including issuance, recording, and interpretation of personnel monitoring devices and bioassay measurements for assigned unit(s).

3. Manages the station ALARA program to aid in implementation of the yearly corporate man-REM (Roentgen Equivalent Man) goal; recommends measures to maintain exposure to personnel "As Low As Is Reasonably Achievable."

4. Supervises the inspection, calibration, maintenance, and testing of all radiological emergency equipment including portable instrumentation, fixed monitors, and emergency life support equipment (SCBA, etc.).

5. Administers the Station Respirator Protection Program, verifies that sorbent canister, line air, and self-contained breathing apparatus (SCBA) are designed, produced, tested, stored, inspected, and set up in strict accordance to Occupational Safety & Health

Administration (OSHA), NRC, Nuclear Regulatory Guide (NUREG), and Station requirements.

6. Supervises the procurement, storage, distribution, and maintenance of Health Physics (HP) related components and systems including testing and evaluation of consumable supplies/clothing, radiation detection equipment and related Health Physics support material.

7. Prepares/publishes legal documentation, reports, and special studies for detailing station health physics activities, station management, corporate personnel, and regulatory agencies.

8. Supervises the preparation and documentation of professional consulting evaluations which detail internal and external radiation events; submits same to station/corporate management, regulatory agencies and affected individuals.

9. Tours plant radiation areas on a routine basis to observe work in progress, evaluate protective measures, correct deficiencies, assure safety conformance, and increase productivity "As Low As Reasonably Achievable" (ALARA compliance).

10. Supervises and verifies radiation worker compliance to the federal, corporate, and station ALARA commitment program including procedure development, mock-up evaluation, and direct surveillance of all radiological work either planned or in progress.

11. Verifies the interpretation of results of the personnel monitoring device measurement program.

12. Oversees the initiation of corrective action and publishing of reports as a result of surveys, audits, plant tours and interpretation of personnel monitoring program results.

13. Coordinates the preparation of bid specifications for major equipment and services related to assigned functions. Reviews and evaluates proposals and recommends vendor selection.

14. Supervises the scheduling and procurement of manpower and material needed to provide adequate radiological controls in support of immediate repairs resulting from forced outages.

15. Coordinates and supervises HP involvement with department heads, NUSCO Engineering and Betterment Construction personnel on station unit projects performed in radiologically controlled areas.

16. Represents station at professional meetings such as the Edison Electric Institute (EEI) Health Physics Subcommittee.

17. Supervises the maintenance of National Bureau of Standards (NBS) registration and accountability for all system and instrument radiation calibration sources. This requires that the radiological measurement program is in conformance to all applicable federal

regulations including NRC position papers and American National Standards Institute (ANSI) standards.

18. Supervises the development of comprehensive radiological requirements and procedures for special projects (steam generator repair, fuel shipout, thermal shield removal, recirculation system decontamination, etc.) for ANSI and NRC review.

19. Supervises health physics QA audit program.

20. Plans and schedules HP activities in support of plant outages and other major work activities.

21. Oversees the preparation, revision, approval, and document control of the radiological emergency procedures.

22. Maintains appropriate industry and NRC contacts and monitors common problems and solutions.

23. Serves as a manager of Radiological Consequence Assessment in the Station Emergency Organization.

24. Prepares and controls annual budgets and expenditures.

25. Supervises the HP and ALARA trending programs for compliance with regulations and standards.

CY Only

26. Supervises the collection, packaging, and proper preparation for shipping and disposal of radioactive waste in accordance with Nuclear Regulatory Commission/Department of Transportation regulations and applicable burial site acceptance criteria (CY only).

27. Oversees the Radwaste trending program to demonstrate compliance to NRC, INPO, and other agencies (CY only).

28. Manages Radioactive Waste Reduction program including decontamination, waste processing and special decontamination projects to ensure corporate radwaste generation goal is achieved (CY only).

29. Manages the operation and maintenance of the onsite laundry processing facility to ensure adequate protective clothing availability (CY only).

ACCOUNTABILITY

1. Availability of sufficient supplies of radiological protection equipment, materials, and instruments to meet station demands.

2. Compliance of the contamination/radiation control program and the respiratory protection program to applicable requirements and regulations.

3. Assurance that radiation workers and health physics personnel are properly trained and qualified to perform activities in radiation areas.

4. Appropriate corrective action such as decontamination or shielding to conform with approved radiation practices and ALARA program.

5. Assurance of accurate sampling, counting, and isotopic identification program.

6. Effective implementation of radiation/contamination control and respiratory protection programs in compliance with regulatory requirements.

7. Coordination of health physics activities with affected departments.

8. Appropriate representation of health physics activities in long-term plans such as expense budget, outage planning and planning for major work activities.

9. Current status of by-product and off site NRC radwaste licenses.

10. Proper storage, packaging, and shipment of radioactive waste with minimal impact on plant operation (CY only).

11. Timely and complete factual reports concerning shipping of waste, reporting of exposures, and analysis of radiological incidents (CY only).

AUTHORITY

1. Authority to stop work due to radiological conditions or unacceptable health physics practices and on the basis of personnel health and safety.

2. Authority to sign increased exposure authorizations up to 2,000 mREM.

3. Authority to approve radiation work permits.

4. Authority to clear safety tagging in support of Health Physics department activities.

5. Approve invoices for services and supplies.

6. Recommend changes to procedures, policies, and programs concerning Health Physics. Recommend contractors and/or major equipment/programs for use by the Health Physics section, such as selection of decontamination services, laundry services, and temporary health physics technician support for outages.

TYPICAL REQUIREMENTS (Minimum)

Training and Experience

1. Baccalaureate degree in a science or engineering discipline or the equivalent.

2. Nine to eleven years related experience in radiological safety with three of the years in applied radiation work at a nuclear facility.

Knowledge/Skill

1. Knowledge of nuclear power plant operations.

2. Maintain knowledge of applicable state and federal regulations dealing with radiation protection, transportation, and emergency planning.

3. Ability to analyze information, determine facts, and make decisions accordingly.

4. Ability to communicate and work effectively with all levels of the company and with counterparts in noncompany organizations.

5. Possess ability to write and speak clearly and concisely.

6. Ability to manage work assignments and obtain high productivity.

7. Ability to manage people effectively.

8. Possess the ability to work in a nuclear power plant environment subject to the following: stress due to potential incidents/accidents, radiation exposure, search by security personnel, on-call restrictions, interruption of personal life by telephone calls and radiopager messages, criticism by antinuclear groups, and potential civil penalties due to your own error or due to errors of your staff.

9. Possess the ability to grasp concepts and make judgments in the areas of ALARA, radiation protection, and radwaste management.

NORTHEAST UTILITIES

NU

EXEMPT
POSITION DESCRIPTION

35/686

PER3429-2 REV. 9-81

POSITION TITLE		GRADE	CODE
HEALTH PHYSICIST			HLPHY
REPORTS TO		DATE	FLSA CLASSIFICATION
HEALTH PHYSICS SUPERVISOR		3/1/85	
GROUP	DEPARTMENT	SECTION	
NUCLEAR ENGINEERING AND OPERATIONS (NEO)	NUCLEAR OPERATIONS	STATION SERVICES	
LOCATION		APPROVED BY	
MILLSTONE/CONNECTICUT YANKEE STATIONS		W. G. Counsil	

THIS POSITION DESCRIPTION INCLUDES THE COMMON RESPONSIBILITIES LISTED ON THE REVERSE SIDE

POSITION SUMMARY

Performs engineering and technical assignments in support of the radiation protection activities to include: analysis of data, definition of techniques for radiological hazard control during work evolution, and monitoring of external and internal exposure for regulatory compliance.

PRIMARY DUTIES

1. Interprets survey data and specifies requirements to quantify radiation dose and protect the worker to include: worker stay-time determination for high dose rate areas, dosimeter type, and proper body placement to account for high radiation gradients and mixed radiation fields, and identification of shielding type and quantity.

2. Develops survey techniques to define personnel dose to skin, extremities, and whole body including correlation of TLD/instrument response, measurement dose to skin or lens of the eye, and the use of body phantoms to represent the worker during a work evolution.

3. Develops and/or reviews personnel skin contamination incident reports and provides a quarterly and yearly summary of site incidents to the Health Physics (HP) Supervisor.

4. Trends both skin contaminations and internal depositions in order to identify generic problems and recommend corrective actions.

5. Performs internal dose calculations based on in vivo or invitro bioassay results and mathematical models which describe the retention and excretion of radionuclides deposited in the body.

6. Implements specialized techniques in gamma spectrometry for Germanium Lithium (GeLi) or Sodium Iodide (NaI) analysis of reactor-specific radionuclides.

7. Coordinates with corporate and/or station management as necessary to fulfill demands of Nuclear Regulatory Commission (NRC) position statements and regulations.

8. Responds as primary contact for NRC or Institute of Nuclear Power Operators (INPO) inspectors concerning whole body counting and internal dose assessment, skin contamination reporting, and various routine HP practices such as calibration or analytical sampling techniques.

9. Oversees operation and quality assurance of whole body counter to insure measurements can be made with a high degree of precision and accuracy within station, NRC, and American National Standards Institute (ANSI) specification.

10. Maintains the necessary documentation to provide technical justification for decisions made of radiological consequence.

11. Provides technical guidance and work direction for technicians for assigned tasks requiring extensive radiological control.

ACCOUNTABILITY

1. Assure that HP equipment is sufficient, state-of-the-art, and acceptable in performance.

2. Compliance of internal dosimetry program to applicable requirements and regulations.

3. Assurance of an accurate sampling, counting, and radionuclide identification program.

4. Consistently acceptable recommendations with respect to corrective actions to personnel contamination incidents.

AUTHORITY

Authority to stop work due to radiological conditions or unacceptable health physics practices.

TYPICAL REQUIREMENTS (Minimum)

Training and Experience

1. Baccalaureate degree in a science or engineering discipline related to health physics, or the equivalent.

2. Five to seven years of related experience.

Knowledge/Skill

1. Thorough knowledge of station, state, and federal radiological protection regulations.

2. Ability to communicate and work effectively with various levels of the station organization and with counterparts in corporate and outside organizations.

3. Thorough knowledge of radiation shielding calculations, equipment, and techniques.

4. Ability to analyze information, determine facts, and skills to evaluate trends and problems analysis.

5. Good communication skills as required for report writing and responding to NRC/INPO inspectors in areas applicable to work performed.

6. Working knowledge of radiological protection techniques related to nuclear power plant operations and systems.

NORTHEAST UTILITIES

THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

EXEMPT
POSITION DESCRIPTION

PER3429-3 REV. 9-81

46/687

POSITION TITLE		GRADE	CODE
ASSISTANT RADIATION PROTECTION SUPERVISOR (OPERATIONS)			ASRPSVP
REPORTS TO		DATE	FLSA CLASSIFICATION
RADIATION PROTECTION SUPERVISOR		3/1/85	
GROUP: NUCLEAR ENGINEERING AND OPERATIONS (NEO)	DEPARTMENT: NUCLEAR OPERATIONS	SECTION: STATION SERVICES	
LOCATION		APPROVED BY	
MILLSTONE/CONNECTICUT YANKEE STATIONS		M. G. Counsil	

THIS POSITION DESCRIPTION INCLUDES THE COMMON RESPONSIBILITIES LISTED ON THE REVERSE SIDE

POSITION SUMMARY

Plans, coordinates, and supervises, for an assigned nuclear unit, the day-to-day work activities relating to monitoring, reporting and controlling radiation and contamination.

PRIMARY DUTIES

1. Schedules and directs the day-to-day work of both department and contract personnel in compliance with applicable regulatory, corporate and station requirements.

2. Schedules manpower and materials to provide adequate radiological controls in support of immediate repairs resulting from forced outages.

3. Determines the radiological control work requirements for work to be performed in the assigned unit.

4. Supervises the performance of radiation/contamination/airborne surveys of the assigned unit.

5. Supervises the proper posting and/or barricading of airborne, radiation, contaminated, and high-radiation areas.

6. Initiates and supervises the decontamination of unit areas, equipment, and personnel.

7. Determines the proper respiratory protection equipment requirements for use in high airborne areas.

8. Determines through direct observation that radiation work permits and regulatory requirements are/have been carried out and verifies strict adherence to radiation work practices.

9. Initiates revises, implements or recommends changes to health physics procedures/instructions.

10. Implements required on-the-job training for department personnel in all phases of health physics practices as assigned.

11. Supervises the calculation of Maximum Permissible Concentration (MPC) hours for plant airborne radioactivity areas.

12. Reviews radiation work permits for completeness and maintains them on file unit disposition to the Nuclear Records facility.

13. Recommends measures to eliminate and/or shield high radiation areas.

14. Reviews plant radiation, contamination, and airborne surveys for completeness and accuracy.

15. Supervises the performance of special radiation surveys and reviews the performance of same.

16. Assist in preparing estimates of manpower and materials required for the work.

17. Prepares and maintains an upgrade schedule for qualified department personnel.

18. Prepares and tracks maintenance and work requests for equipment repair and radiological control barriers.

19. Assists in coordinating maintenance and refueling activities to provide consistent and effective radiological controls.

20. Performs the duties of the Radiation Protection Supervisor in his/her absence.

ACCOUNTABILITY

1. Compliance of health physics activities with corporate and regulatory requirements.

2. Properly conducted radiation, contamination, and airborne radioactivity surveys.

3. Appropriate posting of radiation, contamination, and airborne radioactivity areas.

4. Assure that proper health physics monitoring and control activities provide substantial radiological safety for all plant workers.

5. Health physics related decisions which minimize downtime without compromising plant or personnel safety.

6. Proper implementation of established on-the-job training programs for assigned department personnel in all phase of radiation protection (Operations) practices, as assigned.

AUTHORITY

1. Authority to stop work due to significant radiological safety issues and on the basis of personnel health and safety.

2. Approve radiation work permits.

3. Authorize tagging clearance in support of Health Physics departments activities.

TYPICAL REQUIREMENTS (Minimum)

Training and Experience

1. Associate degree in engineering, science, or the equivalent.

2. Seven years related experience of which 3 years shall be at a nuclear power facility.

Knowledge/Skill

1. Thorough knowledge of federal regulations, regulatory requirements, and industry standards pertaining to radiation protection.

2. Ability to analyze information, determine facts, and make decisions accordingly.

3. Ability to communicate and work effectively with various levels of the plant organization.

4. Ability to write clearly and concisely.

5. Detailed knowledge of work scheduling, tracking, and reporting used in support of assigned unit operations.

6. Possess the ability to supervise the work of others.

MSP23

HEALTH PHYSICS TECHNICIAN

HLPHYT

MILLSTONE STATION

2/1/83

JOB SUMMARY

Monitors plant facilities and work environment to detect the pressure and degree of radioactivity in connection with the operation of a nuclear steam generating plant. Maintains radiological control of immediate working environment to reduce radiation exposure to individual workers, to avoid exposures in excess of limits and to insure compliance with all appropriate regulations and procedures.

PRIMARY DUTIES

1. Performs radiation dose rate, contamination and airborne surveys.

2. Evaluates results of surveys and takes immediate corrective action when necessary.

3. Uses laboratory counting instrumentation including MCA/Ge(Li), RD-17, BC-4, LCS-1, etc.

4. Monitors all radiological work and ensures proper controls are maintained in immediate working environment.

5. Recommends proper respiratory protection equipment for situations involving potential and/or actual high radioactive airborne concentrations.

6. Performs Technical Specification surveillances assigned to Health Physics department.

7. Provides weekend and backshift health physics duties.

8. Surveys radioactive waste shipments to ensure all plant, state and federal regulations are complied with; prepare necessary records/forms.

9. Performs decontamination and monitoring of contaminated personnel.

10. Monitors equipment and area decontamination efforts and advises personnel when acceptable levels have been achieved.

11. Directs the construction of containments and performs the set-up of glove bags and ventilation systems used to reduce personnel exposure to airborne contaminants.

12. Determines radioactive hot spot locations and provide direction in installing shielding.

13. Recognizes ALARA requirements and recommends exposure reducing concepts whenever possible.

14. Maintains complete and accurate logs of all routine a[illegible] surveys.

15. Performs whole body counting of plant, utility [illegible] personnel and evaluates gross data.

16. Calibrates health physics instrumentation ag[illegible] to insure their accuracy; perform operational s[illegible] of instruments and equipment.

17. Operates computerized dosimetry system.

18. Calibrates personnel monitoring devices.

19. Performs inventory and inspection of all station radiological emergency equipment.

20. Issues personnel monitoring devices and maintains appropriate dosimetry records in compliance with federal and state regulations.

21. Takes proper corrective action in event of an unplanned radiological occurrence.

22. Operates respirator fit test and canister testing equipment, interpret and document results.

23. Performs as an Emergency Monitoring Team member.

24. Acts as Assistant Radiation Protection Supervisor when upgraded during shift coverage and refueling outages.

25. Performs routine safety monitoring involving radiological control work and other assigned work.

26. Specifies protective clothing and equipment and enter Health Physics data on radiation Work Permits.

27. Routinely visits work areas to insure compliance with all requirements of Radiation Work Permits.

28. Stops work when significant radiological hazards or serious noncompliance with RWP's is discovered.

29. Evacuates work areas when significant radiological hazards are discovered.

30. Reports to Assistant Radiation Protection Supervisor all instances and details of noncompliance with health physics procedures or RWP's.

31. Reports to Assistant Radiation Protection Supervisor all significant radiological hazards.

32. Issues respiratory equipment and radiation survey equipment.

ACCOUNTABILITY/END RESULTS

1. Timely and accurate completion of assigned health physics duties.

TYPICAL REQUIREMENTS (Minimum)

Training and Experience

1. High school diploma or equivalent with an emphasis in math or science, plus one year of formal training related to radiological control.

2. Three years experience in radiological protection at a nuclear facility.

Knowledge/Skill

1. Knowledge of station, state and federal regulations.

2. Ability to communicate and work effectively with all levels of the organization.

3. Working knowledge of health physics theory and control methods.

4. Basic knowledge in health physics regulations, procedures, techniques and equipment.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS

All Northeast Utilities personnel working at Millstone Station who have access to radiologically controlled areas attend an initial mandatory 8 hour training class with written qualification tests and practical factor demonstrations. This course covers fundamental radiological science subjects including radiation effects to personnel, health physics controls, radiological posting, and warning signs/barriers, dosimetry requirements, etc. These classes are performed by full-time trained instructors using approved lesson plans and testing questions recommended by INPO. The radiological test consists of 30 questions and requires an 80% correct answer percentage for a passing score. Personnel failing the written test are retrained and retested. Records of lesson plans, attendance and test results are maintained for inspection by corporate auditors and regulatory agencies. This program is repeated annually at a 2-4 hour class duration for experienced radiation area workers. Short-term visitors to Millstone Station are required to read and sign a radiation awareness booklet and be escorted by trained personnel during their visit to Millstone Station. No personnel (permanent station or visitor personnel) are allowed entry into Radiation Work Permit (RWP) areas without documented completion of formal radiation worker training. Under special conditions (i.e., training session is unavailable due to holiday, nighttime entry) the Health Physics Supervisor has the authority to waive the formal training requirement for entry into RWP areas. Permission is granted in these cases if the visitor is engaged in low-risk evolutions, is an experienced radiation worker and is under the 1 to 1 escort of a trained station radiation worker. It is mandatory that all personnel entering radiation areas at Millstone Station be issued personnel monitoring dosimetry.

Since personnel at Millstone Station are annually trained, tested and/or escorted if a short-term visitor; unauthorized or unintentional entry into areas containing by-product material is unlikely. Any known or potential intrusion into areas where by-product material is stored, or in use, is immediately reported to the Health Physics Supervisor.

Additional efforts are made to eliminate inadvertent or malicious association with by-product material. As described above, training plays a major role in radiation area awareness. The following mechanisms are in place to minimize unauthorized association with by-product material.

A. Authorization Storage and Use Areas:

The use areas and storage locations of by-product material requested in this license for Millstone Unit No. 3 are:

1. Health Physics Laboratory Facilities
2. Chemistry Laboratory Facilities

3. I&C Laboratory Facilities
4. Areas of power plant where fixed monitoring units are located

The above listed facilities are occupied by Northeast Utilities supervisors and technicians trained in health physics principles and procedures. Depending on the by-product material sources in use at these facilities, controls for low-level check sources might consist of:

1. Sources used by trained individuals in accordance with written procedures

2. Identification labels and warning statements affixed to individual check sources

3. Radiological warning signs posted at work area boundaries

Controls for the use of high-level sources may consist of:

1. Specific RWP controls in effect for intended work scope

2. Formal A.L.A.R.A. reviews performed and posted at work site

3. Multiple whole-body and extremity TLD badging for workers using high-level sources

4. Full-time Health Physics Technician coverage during source use

5. Locked and/or guarded work area boundary controls

6. Evacuation of unnecessary personnel

7. Multiple interlocks (lights, locks, alarms) on source removal mechanisms

8. Continuous radiation detectors installed with localized and remote readouts/alarms in both work areas and adjacent areas

B. Security Coverage

Millstone Station has an NRC approved security plan in effect to oversee plant security, guard against theft and prevent malicious sabotage.

C. Contamination Monitors

All personnel exiting Millstone Station radiologically controlled areas must pass through a whole-body contamination monitor (NMC-Gamma 10 model). This monitor has a detection sensitivity of 150 nCi Co-60/Cs-137 equivalent activity. Personnel exiting any controlled areas (areas with surface activity > 1,000 dpm/100cm^2

beta-gamma, 20 dpm/100 cm^2 alpha) must first perform a whole-body frisk using an Eberline Rm-14/HP 210 or equivalent. This instrument when used at a ¼" survey distance and slow frisk speed can detect approximately 1,000-5,000 disintegrations per minute (dpm) per 20 cm^2 probe area.

9. FACILITIES AND EQUIPMENT

Millstone Unit No. 3 will use by-product material essentially in three areas: Health Physics Laboratory, Chemistry Laboratory and I&C Laboratory. A fourth generalized area of by-product material use are various areas of the Millstone Unit No. 3 site in locations where radiation monitors are permanently affixed to plant structures and components. For example, a calibration source will be transported to the reactor containment building to response check a containment hi-rad monitor. In all areas of use, the by-product material depending on source strength, radiation examinations, physical forms, intended use, etc., are controlled by:

1. Written Procedures
2. Trained Personnel
3. Warning Labels
4. Posted Boundary Controls
5. RWP Compliance
6. Dosimetry Devices
7. Calibrated Detection and Safety Instrumentation
8. A.L.A.R.A. Controls

These subgroups are further detailed in Section 10.

Since Millstone Unit No. 3 uses predominately stable, solid form, non-volatile, encapsulated, low activity by-product material no sophisticated mechanical controls are required under ordinary use. Regulatory Guide 10.5 asks if the facility requesting by-product material has capture and containment devices such as glove boxes, fume hoods, etc. Millstone Station possesses devices such as: negatively pressurized, HEPA filtered, isokinetically monitored, radiation interlocked containment structures, glove boxes, and other capture devices. However, Millstone Unit No. 3 does not anticipate the need or use of this equipment for low-level, non-volatile, stable form calibration and check source by-product material. Any by-product material that is volatile or dispersible to atmosphere under normal operating conditions (i.e., radioactive gases used to calibrate chemistry effluent monitors) are used either in enclosed monitoring systems and recovered for reuse or directed to a monitored release stack and released to the environment.

The single largest by-product material source requested under this license is a 400 curie Cs-137 instrument calibrator manufactured by the J. L. Shepherd and Associates Company, Glendale, California. This source calibrator is an industry standard device which is in use in several power facilities in the United States. The personnel who will operate this equipment in Millstone Unit No. 3 have used J. L. Shepherd calibrators for over 8 years. During this time period extensive procedures, safety evaluations and experience has been accumulated of this equipment.

The 400 curie Cs-137 Shepherd calibrator has integral high radiation designed interlocks and warning system (bells/lights) preventing an unshielded removal of the Cs-137 source from the stowed position. An

additional high radiation security lock is affixed by the Health Physics Department to the Shepherd calibrator control panel. The room in which the Shepherd calibrator is located is also locked with another hi-level radiation security lock. All locks/keys are under the key control of the Health Physics Department. The room in which the Shepherd calibrator is used has two independently wired and radiation designed (Geiger-Mueller and ion chamber) instruments that give localized and remote alarm signals in the event of equipment malfunction or operator error. Typically, the radiation levels experienced exterior to the 400 curie Shepherd calibrator with full strength source exposure is less than 5 mr/hr to the operator. The Shepherd calibrator is under the direct control of the Radiation Protection Officer (Health Physics Supervisor). The operational supervision of the Shepherd calibrator is the Radiation Protection Supervisor - Support.

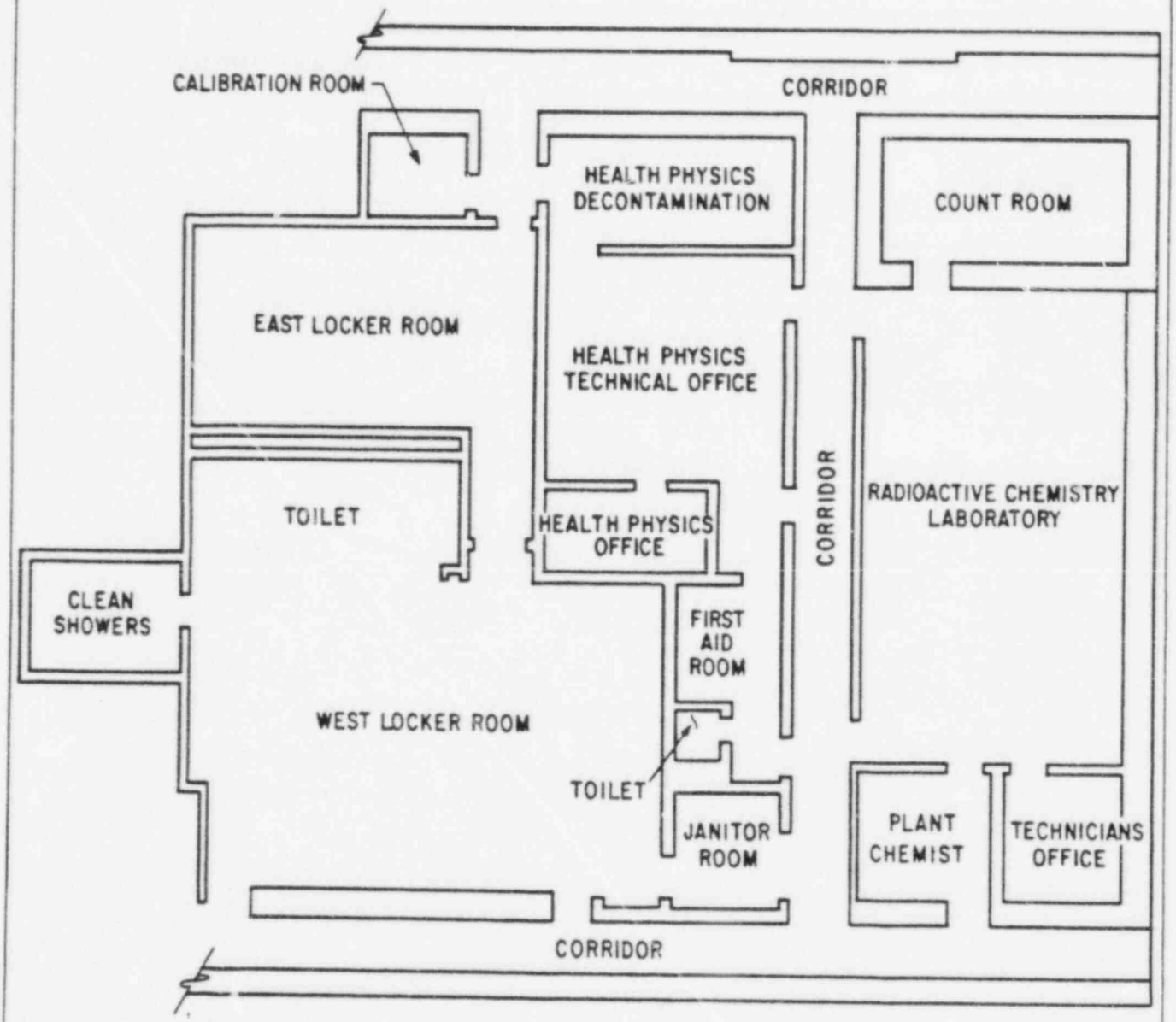
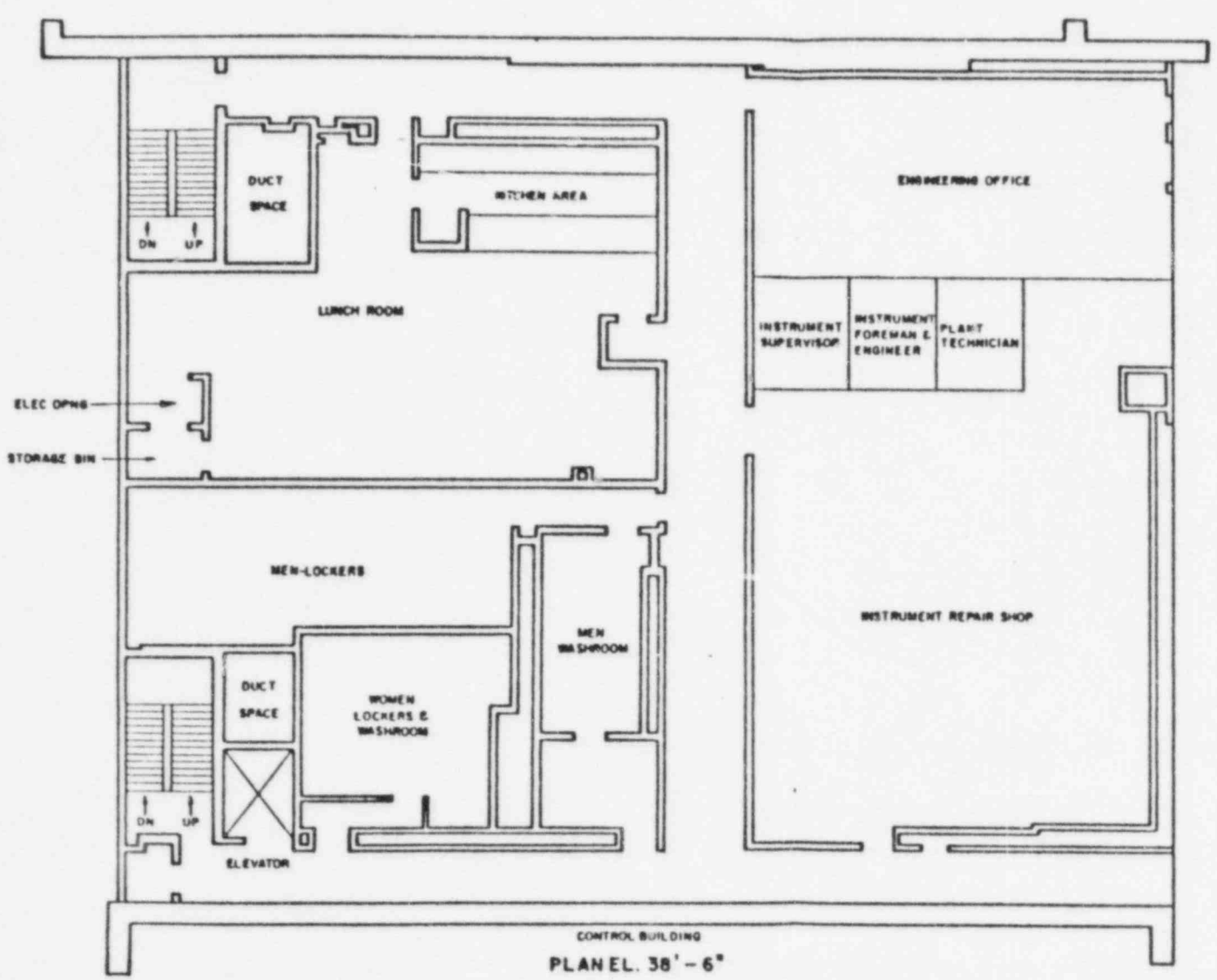


FIGURE 12.5-1
HEALTH PHYSICS AND CHEMISTRY FACILITIES
MILLSTONE NUCLEAR POWER STATION
UNIT 3
FINAL SAFETY ANALYSIS REPORT



PLAN EL. 38'-6"

FIGURE 3.8-72 (3 OF 4)
SERVICE BUILDING
MILLSTONE NUCLEAR POWER STATION
UNIT 3
FINAL SAFETY ANALYSIS REPORT

10. RADIATION SAFETY PROGRAM

The Millstone Unit No. 3 Radiation Safety Program is described in the following pages extracted from the Millstone Unit No. 3 Final Safety Analysis Report (Section 12.5). Revisions to the attached FSAR pages are shown as they will appear in the amendment to the FSAR. A description of the sealed source leak test procedure for Millstone Unit No. 3 is also provided herein.

12.5 HEALTH PHYSICS PROGRAM

12.5.1 Organization

The health physics program is established to provide an effective means of radiation protection for permanent and temporary employees and for visitors at the station. To provide an effective means of radiation protection, the health physics program incorporates a philosophy from management (Section 12.1.1); employs qualified personnel to supervise and implement the program (Section 13.2); provides appropriate equipment and facilities; and utilizes written procedures designed to provide protection of station personnel against exposure to radiation and radioactive materials in a manner consistent with Federal and State regulations (Section 13.5). The health physics program is developed and will be implemented through the applicable guidance of Regulatory Guides 8.2, Revision 0; 8.8, Revision 3; and 8.10, Revision 1.

The health physics department will implement and enforce the health physics program. The health physics program at Millstone 3 is developed and will be implemented as established for Millstone 1 and 2. Common to Millstone 1, 2, and 3, is the radiological services supervisor, who reports directly to the station services superintendent, and directs the health physics supervisor.

Reporting directly to the health physics supervisor is a health physicist. Also reporting directly to the health physics supervisor is a radiation protection supervisor who is assigned to each unit and the Health Physics Services group. An assistant radiation protection supervisor and ALARA coordinator, reporting directly to the unit radiation protection supervisor. The ultimate responsibility of the health physics program lies with the station superintendent.

The radiological services supervisor shall meet or exceed the qualification for radiation protection manager, as specified in Regulatory Guide 1.8, Revision 1. The health physics supervisor shall meet or exceed the qualifications for radiation protection manager in Regulatory Guide 1.8, Revision 1.

Additional information on the qualifications and experience of the health physics personnel can be found in Section 13.1.1.

Health physics technicians shall meet or exceed the qualifications specified in ANSI N18.1

471.24

The chemistry department is responsible for measuring the radioactive content of all gaseous and liquid effluents from the site in accordance with the requirements of the Environmental Technical Specifications and 10CFR20.

The chemistry supervisor reports directly to the radiological services supervisor.

The health physics department coordinates with all station, corporate, and contractor organizations to provide health physics coverage for all activities that involve radiation or radioactive material. The health physics department is organized to provide the following services:

1. Preparation and implementation of health physics procedures for routine and nonroutine activities associated with the operation, maintenance, inspection, and testing at the station

2. Compliance with regulatory limits for maximum permissible dose limits and contamination levels

3. Maintenance of a personnel radiation dosimetry program and dosimetry records

4. The surveying of station areas, maintenance of survey records, and the posting of survey results for daily activities within the station

5. Assistance in the station training program by providing specialized radiation protection training

6. Procurement, maintenance, and calibration of radiation detection instruments and equipment for assessment of the radiation areas

7. Procurement, maintenance, and issuance of protective clothing and equipment

8. Assistance in the shipping, storage, and receiving of all radioactive material to assure compliance with regulatory requirements

9. Assistance in the decontamination of personnel, equipment, and facilities

10. Preparation, maintenance, and issuance of the required regulatory, station, and personnel reports that are associated with radiation or radiation exposure

11. Preparation, maintenance, and implementation of the respiratory protection program

It is a policy of the Northeast Nuclear Energy Company (NNECo.) to keep personnel radiation exposure within the applicable regulations, and beyond that, to keep it as low as reasonably achievable.

12.5.2 Equipment, Instrumentation, Facilities

The criteria for purchasing the various types of portable and laboratory equipment used in the health physics and chemistry departments is based on several factors. Portable survey and

laboratory radiation detection equipment is selected to provide the appropriate detection capabilities, ranges, accuracy and durability.

required for the expected types and levels of radiation anticipated during normal operating or emergency conditions. Selection of respiratory protection equipment such as full-face masks, self-contained breathing apparatus, and respirator filters will be made following the guidance of applicable approval regulations contained in 30CFR 11 and National Institute for Occupational Safety and Health's (NIOSH) Certified Equipment Manual.

Health physics equipment, such as portable survey meters, is stored by health physics. Survey equipment for use in emergency situations is stored in emergency kits which are located in such areas as the control room and the emergency operation facility. Special portable equipment, such as personnel air samplers to be worn on protective clothing, is available from health physics, and will be utilized at the discretion of the health physics supervisor/cesignee. Respiratory protection equipment is stored at the respiratory storage and issue facilities.

Portable instruments for measuring radiation or radioactivity are used as required by 10CFR 20, Section 20.201, and by the requirements set forth in Regulatory Guide 1.97, Revision 2. Portable health physics instruments to be used are listed in Table 12.5-1 by type, range, accuracy, quantity, and location. Calibration of all portable health physics instrumentation will be performed within frequencies specified by manufacturers' specifications and procedural requirements or as deemed necessary by the health physics supervisor/designee. As is currently practiced at Millstone 1 and 2, calibration, operation, and maintenance procedures shall be followed for each specific type of instrument. Detailed records shall be followed for each specific type of instrument. Detailed records of calibration and maintenance of each instrument will be maintained at the station. Calibrations will be performed using radiation sources of known activity. These sources shall be calibrated or certified accurate by the National Bureau of Standards. Calibration sources are stored by health physics. Actual calibration of equipment will be performed in the calibration laboratories or other appropriate facilities.

The health physics laboratory and chemistry laboratory instruments are listed in Table 12.5-2 by type, detector, quantity, and location. Health physics or chemistry personnel will check each counting system at regular intervals with standard radioactive sources to determine counting efficiencies, proper voltage settings, and background count rates. Records will be maintained for each instrument or counting system. Repair and maintenance of laboratory equipment will be performed by station personnel or through vendor repair contracts.

The station will be divided into two sections, the clean area and the radiation control area (RCA). The RCA will encompass all plant areas in which radioactive materials and radiation exist that might result in doses in excess of the permissible levels discussed in 10CFR 20, Section 20.105 should improper control exist (Section 12.3). Access to the RCA will be limited to those persons authorized entry by

Millstone Units 1, 2 and 3 maintain a common inventor of hand held radiation meters pocket ion chambers (dosimeters), and thermoluminescen devices (whole body beta, gamm neutron TLDs and extremity finger ring TLD) The Millstone Station health physics group and NNECO Corporate Resource Group maintains adequate supply of hand held radiation meters pocket dosimeters and TLDs for normal station activities, multiple unit shutdowns and/or potential accident conditions.

station supervisors and health physics personnel. Entry to and exit from the RCA will be through designated Access Control Points where applicable.

A portal monitor and/or frisker will be located at selected control points to prevent the spread of radioactive contamination to the areas outside the RCA. Performance and other requirements for personnel monitoring equipment will follow the guidance of applicable Regulatory Guides. At the discretion of the health physics supervisor, a personnel monitor or frisker will be placed in specific areas at the station where contamination or the potential for contamination may be present.

Any areas where radioactive materials and radiation may result in doses in excess of the permissible levels discussed in 10CFR20, Section 20.105 will be surveyed, classified, and conspicuously posted with the appropriate radiation caution signs, labels, and signals in accordance with 10CFR20, Sections 20.203 and 20.204, except as described below. 471.25

Administrative and physical security measures will be employed to prevent unauthorized entry of personnel into any high radiation areas. Each high radiation area in which the intensity of radiation is greater than 100 mRem/hr but less than 1000 mRem/hr shall be barricaded and conspicuously posted as a high radiation area. Additionally entrance thereto shall be controlled by requiring issuance of a Radiation Work Permit. Health Physics personnel or personnel escorted by Health Physics personnel shall be exempt from the RWP issuance requirement during the performance of their assigned radiation protection duties, provided they comply with approved radiation protection procedures for entry into high radiation areas. 471.25

(i.e. radiation ribbon, rope and stanchions, or similar barrier designs)

Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

a. A radiation monitoring device which continuously indicates the radiation dose rate in the area.

b. A radiation monitoring device which continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate level in the area has been established and personnel have been made knowledgeable of them.

c. An individual qualified in radiation protection procedures who is equipped with a radiation dose rate monitoring device. This individual shall be responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified in the Radiation Work Permit. The surveillance frequency shall be established by the Health Physics Supervisor.

These requirements shall also apply to each high radiation area in which the intensity of radiation is greater than 1000 mRem/hr. In addition, locked doors shall be provided to prevent unauthorized entry into such areas and the keys shall be maintained under the administrative control of the Shift Supervisor on duty and/or the Health Physics Supervisor. 471.25

Traffic patterns will normally discourage or prevent access to radiation or potential radiation areas. Warning signs, audible and visible indicators, barricades, or locked doors will be employed to protect personnel from access to high radiation areas that may exist temporarily or semi-permanently as a result of unit operations and maintenance.

Health physics services and facilities are developed to provide all workers the necessary protection against radioactive contamination. The health physics facilities are located in the service building at elevation 24 feet-6 inches (Figure 12.5-1).

Administrative health physics activities will be centered around the health physics office. Standard office equipment, equipment storage areas, records storage, and some personnel dosimetry equipment are among the items to be included in the health physics office. Personnel decontamination supplies and equipment will be stored in the health physics decontamination facility. This room contains stainless steel showers and sinks, with drains directed to the wastewater treatment system (Section 9.2.3). A low-background count laboratory is used for counting and/or identifying radioactivity in airborne and liquid samples in conformance with 10CFR20, Section 20.201 and General Design Criterion 64. The chemistry laboratory will be used to perform chemical and elemental analyses of environmental effluents. All sink and floor drains in this room are

directed to the wastewater treatment system; fume hood exhaust is directed to the ventilation system. Equipment used to perform routine counting and analyses on all plant radioactivity samples, as required by 10CFR 20, Section 20.201 is listed in Table 12.5-2.

All personnel entering contaminated areas will be required to wear protective clothing. The nature of the work to be done and the contamination level in the area will be the governing factors in the selection of protective clothing to be worn by individuals. [redacted] Additional protective clothing stations will be established at temporary dressing rooms or strategic locations, as required, to ensure efficient operations and to preclude the spread of contamination. Protective clothing available at the station will include the following:

1. Shoe covers
2. Overshoe rubbers
3. Head covers
4. Cotton and rubber gloves
5. Coveralls and lab coats

Additional items of specialized apparel will be available for operations involving high-level contamination, such as:

1. Plastic or rubber suits
2. Face shields
3. Respirators

All protective clothing will be cleaned and decontaminated at a vendor laundry, onsite dry clean facility, or will be disposed of as radioactive waste.

Appropriate written procedures will govern the proper use of protective clothing, where and how it is to be worn and removed, decontamination facilities for personnel and equipment, and the areas to be used (Section 13.5).

Respiratory protective equipment will be available to station personnel and issued to individuals, as required by actual or potential radiological conditions of the work assignment. The respiratory protection program will follow the guidance of Regulatory Guide 8.15, Revision 0, and will comply with 10CFR 20, Section 20.103. Respiratory protection equipment will be stored at the respiratory storage and issue facilities. Respiratory equipment may include:

1. Pressure demand full-face-piece air line respirators

2. Continuous air flow hoods or suits

3. Pressure demand full-face-piece self-contained breathing apparatus

4. Full-face mechanical filter respirators

[redacted] Respiratory protective equipment will be cleaned, sanitized, repaired and decontaminated at respirator storage and issue facilities.

Continuous air monitors with direct readout and alarm capabilities will be located in [redacted] the onsite technical support and emergency operations centers. In the event of an accident situation, silver-loaded silica gel cartridges are available for use in the monitor. These cartridges are able to selectively collect iodines over noble gases, thus preventing noble gas saturation of the cartridge which causes counting interferences.

Use of the continuous air monitor provides assurance that all areas occupied by essential personnel (control room, technical support, and emergency operations centers) will be monitored.

For other plant areas (e.g., auxiliary building), the operator actions and time requirements are not as critical for safe operation of the plant. Therefore, for these areas, the onsite emergency team kits have been supplied with portable air samplers, silver-loaded silica gel cartridges, and gross beta-gamma detectors and scalers. These provide the ability to obtain air samples from any accessible area of the plant and to quickly count samples in a low background area. Since the silica gel cartridges selectively adsorb iodines, the use of gross counters provides an adequate indication of airborne iodine levels. Ge(Li) detectors are available to perform a gamma spectrum analysis.

The official and permanent record of accumulated external radiation exposure received by station personnel, visitors, and support personnel who enter radiation areas, will be obtained principally from the interpretation of thermoluminescent dosimeters (TLD's). All persons subject to occupational radiation exposure will be issured TLD's and will be required to wear such TLD's at all times while within any radiation control area.

Direct-reading pocket ion chambers will be issued as an additional method for determining gamma exposure. All individuals will be required to examine their direct-reading dosimeters at frequent intervals while in radiation areas. Individuals who receive a dosimeter reading greater than 3/4 of full scale will be required to [redacted] report their exposure to health physics personnel and have their pocket dosimeters rezeroed if applicable. The use, care, and testing of these direct reading dosimeters will follow applicable guidance of Regulatory Guides 8.4, Revision 0 and 8.14, Revision 1.

Special or additional dosimetry, such as finger ring dosimeters and audible-alarm dosimeters, will be issued under special conditions at the discretion of the health physics supervisor/designee. All personnel dosimetry will meet performance and other requirements through the applicable guidance of Regulatory Guides 8.4, Revision 0; 8.14, Revision 1; and 8.28, Revision 0. Refer to Table 12.5-1 for the type of instruments, sensitivity ranges, accuracies, quantities, and storage locations for all personnel monitoring instruments.

The TLD's will be processed at monthly intervals by the Northeast Utilities Service Company (NUSCo.) Dosimetry Laboratory or more frequently at the discretion of health physics personnel. In addition, TLD's will be immediately processed whenever it appears that an overexposure may have occurred.

Dosimeter records will furnish the exposure data for the administrative control of radiation exposure. Exposure records for each individual will be maintained in accordance with the guidance of Regulatory Guide 8.7, Revision 0.

12.5.3 Procedures

All health physics procedures and methods of operation for assuring that occupational radiation exposure will be as low as reasonably achievable (ALARA) follow the provisions and suggestions of Regulatory Guides 8.8, Revision 3; 8.10, Revision 1; and 1.33, Revision 2, as applicable. Such procedures will be implemented by qualified personnel whose qualifications meet the requirements of Regulatory Guide 1.8, Revision 1. In addition, all administrative and procedural practices associated with the monitoring of occupational radiation exposure follow the guidance of Regulatory Guides 8.2, Revision 0; 8.7, Revision 0; 8.9, Revision 0; and 8.26, Revision 2.

Most health physics procedures developed and performed at Millstone 1 and 2 will be utilized at Millstone 3. Health physics procedures are an integral part of the ALARA program as discussed in Section 12.1.

Access to restricted areas will be controlled by administrative and physical security measures as required by 10CFR 20, Section 20.203. Station management assures entry control to high radiation areas through the administration of radiation work permits (RWP) that stipulate purpose of entry, work location, radiological conditions, surveillance and dosimetry requirements, stay time, protective clothing, respiratory protective equipment, special tools, portable shielding, special personnel monitoring devices, and other procedural requirements.

Some objectives for issuing RWP's are the following:

1. Provide a detailed assessment of the actual and potential radiation hazards that are associated with the job function and area

2. Ensure that proper protective measures are taken to safely perform the required tasks in the area and to maintain occupational radiation exposure as low as reasonably achievable

3. Provide a mechanism for individuals to acknowledge their understanding of the radiation conditions, the protective and safety equipment and measures required, and the willingness to follow the requirements designated on the RWP

4. Provide a system for recording the sources (station systems and components), job types and functions, and personnel categories where exposures occur

RWP's are issued for routine and nonroutine activities performed in contaminated areas, airborne radioactivity areas, and for all activities that require entrance into high radiation areas as defined in 10CFR20, Section 20.202. RWP's will also be issued prior to maintenance or inspection of contaminated or radioactive equipment with removable contamination in excess of 1,000 dpm/100 cm^2 beta-gamma and/or 100 dpm/100 cm^2 alpha; radiation dose rates in excess of 100 mRem/hr or where a whole body exposure of 100 mRem within a week on the performance or duration of a specific job is likely. RWP's are also required prior to entrance into the reactor containment of any unit and in any posted neutron radiation area where neutron radiation exists.

Under limited situations and at the discretion of the health physics supervisor/designee, continuous health physics personnel coverage may be substituted for an RWP, such as an emergency which threatens personnel or plant safety.

471.25 | Stay-time will be determined such that occupational exposures will be in accordance with the provisions of 10CFR20, Sections 20.101, 20.102, and 20.103.

Prior to entrance into an RWP area, a survey will be performed to determine the radiological conditions of the area.

Health physics personnel will routinely survey selected areas of the station to assess and control exposure to radiation and radioactive materials in accordance with 10CFR20, Section 20.102 and 20.401. Depending on the type of survey required and anticipated types and levels of radioactivity, various portable instruments and techniques will be used to perform these surveys. Results of all surveys are recorded and kept on file at the health physics office on a short-term basis. If necessary, survey sheets may be posted. Permanent storage is provided by forwarding records to the nuclear records facility. Reporting practices for all normal and accident conditions will comply with the regulations set forth in 10CFR 20, Section 20.401, 20.403, and 20.405.

Area surveys are performed at scheduled frequencies, based on location, radiation levels, station status, and occupancy. All area

survey readings are recorded and filed as required by 10CFR 20, Section 20.401 and Regulatory Guide 8.2, Revision 0. Caution placards, describing the radiological conditions, will be posted to comply with the requirements of 10CFR 20, Section 20.203.

Surveys for contamination will be used to assess containment of radioactive materials and the need for decontamination of an area. Contamination will be measured at selected locations throughout the station, where the potential for the spread of contamination exists. Contamination surveys will be made using the "smear" or "swipe" technique, or by using an appropriate portable instrument. Scheduled frequencies will be based on location, radiation levels, station status and occupancy, or as required by actual operating conditions, and as directed by the health physics supervisor/designee. Contamination surveys will also be performed on personnel, equipment, and in uncontrolled areas to ensure that radiological control methods are adequate. Personnel, equipment, and material leaving contaminated areas will be monitored to prevent the spread of contamination into clean areas. Areas, equipment, and personnel that may be contaminated with radioactive material will be decontaminated using effective methods and techniques, meeting the requirements set forth in Regulatory Guide 8.8, Revision 3, based on the results of a cost-benefit analysis, or management directive,

Levels of contamination will also be used to judge the potential for airborne radioactive material and the need for monitoring air.

It is management's intent to control airborne radioactivity levels as effectively as practicable by proper preventive measures, engineering controls, and good housekeeping techniques. In the event of a radioactive airborne problem, every effort will be made to promptly assess the situation. Section 12.3.4 provides information on the installed airborne radioactivity monitoring instrumentation.

Control of airborne radioactivity levels will be assured through the use of the station's heating, ventilation, and air-conditioning (HVAC) systems and portable air movers and filters. The HVAC systems provide controlled air movement and filtration capability for those areas with a high potential for airborne radioactivity problems. As required, special control techniques will be used to minimize airborne exposure arising from special work projects. Respiratory protection equipment will be available for use in those situations where airborne radioactivity hazards exist and where other control measures are inadequate at the location and time.

The special control techniques used to minimize airborne exposure include decontamination of the component or area prior to performing work, keeping work surfaces damp while work is in progress, and using tents or glove bags in conjunction with appropriate, filtered ventilation systems. 471.26

Techniques for obtaining breathing zone air samples in areas representative of the workers breathing zone are grab samples taken [redacted] and/or lapel air samplers. 471.26

Some conditions which require special air sampling include lifting the reactor vessel head, venting a contaminated system, and working on an open contaminated system.

471.26 In regard to reporting practices for airborne contamination surveys, Health Physics supervision is notified when airborne concentrations read 25 percent of MPC and the area is posted.

All airborne contamination survey sheets are reviewed by Health Physics supervision and filed.

The air sampling program provides information on the potential inhalation of radioactive material by workers. The information will be used to determine what remedial action or protective measures such as respirators, glove boxes, or engineering controls are necessary to protect the worker. Air samples will be taken for all work on systems which have the potential for release of airborne radioactivity. Surveys will be performed on a routine basis, depending on location, station status, and occupancy. In addition, surveys will be performed whenever work is required on a known or potentially contaminated system that must be opened to the working environment or whenever welding, burning, or grinding is performed on a known or potentially contaminated system.

Surveys will also be performed whenever the continuous air monitor indicates an airborne problem and prior to containment entry. Additional surveys will be performed as deemed necessary by the health physics supervisor/designee.

Prior to issuance and use of respiratory protection equipment, each individual must have satisfactorily completed the following:

1. A satisfactory medical evaluation to ensure that the individual is medically fit to use respiratory protection devices

2. Training for the device to be used

3. A fit test (face sealing devices only) using the sodium chloride aerosol test booth or equivalent test

4. A whole body count, if applicable [redacted]

The air sampling program meets the recommendations and provisions of 10CFR 20, Section 20.103, Regulatory Guide 8.15, Revision 0, and NUREG-0041.

Special procedures will be implemented to control the handling or movement of material within and from radiation or controlled access areas, such as the shipment and receipt of radioactive materials. These procedures comply with the regulations stipulated in 49CFR, 70 and 71, and 10CFR20.205.

As previously discussed in this section, all permanent and temporary personnel required to work in restricted areas will receive a TLD and direct-reading pocket ion chamber to monitor personnel exposure. Exposure records are filed and retained for each individual in accordance with the recommendations of Regulatory Guides 8.2, Revision 0 and 8.7, Revision 0, and as required by 10CFR 20, Section 20.407. Any reports of overexposures and excessive levels and concentrations will comply with the regulations of 10CFR 20, Sections 20.403 and 20.405. Reports of personnel monitoring upon termination of employment or work will comply with the regulations of 10CFR 20, Section 20.408. Reports of theft or loss of licensed material will be issued in accordance with the regulations required by 10CFR 20, Section 20.402.

The bioassay program at the Millstone Point Nuclear Power Station follows the guidance of Regulatory Guides 8.9, Revision 0 and 8.26, Revision 2 and meets the requirements of 10CFR 20, Section 20.103. The bioassay program includes:

1. Determination of the conditons under which bioassays should be required

2. Selection of measurement techniques, measurement frequency, and program participants

3. Action points and actions to be taken based on measurement results

4. Interpretation of measurement results in terms of location of radioactive material in the body, the quantity present, the rate of elimination, and the resulting dose commitment.

A whole-body counter is located at the station as needed for in vivo measurement of station personnel, visitors, or support personnel. The whole-body counter will provide preliminary background information, periodic evaluation, and emergency capability for detecting internal exposure conditions. Assessment of internal radiation exposure for station perosnnel who regularly enter the RCA will be performed at least annually.

Under certain circumstances, a special assessment of internal radiation exposure of an individual may be performed for:

1. Work having a high hazard of radioactive contamination intake, especially jobs involving exposure to radioactive iodine

2. Incidents involving contamination around the nose or mouth

3. Accidents involving a potential intake. Excreta samples from suspected individuals may be sent to a qualified laboratory for analysis.

All records and reporting of personnel radiation doses will meet the provisions of Regulatory Guides 8.2, Revision 0; 8.7, Revision 0; and 10CFR 20, Sections 20.401, 20.403, 20.405, 20.407, and 20.408.

Training of operations, maintenance, and technical services personnel in radiation protection principles and procedures will take place prior to the initial unit operation. New employees, contractors, and other supporting personnel will be given orientation training at the beginning of their work assignments.

All permanent station personnel who are required to work in the RCA will be required to successfully complete basic training courses, lectures, and practical exercises to demonstrate their proficiency and competence.

The health physics training program will maintain the proficiency of employees through training and periodic retraining lectures and exercises. Additional training will be given for specific jobs which require added radiation protection.

The health physics training program and the associated written and practical tests will be designed to meet the objectives specified in Regulatory Guide 8.27, Revision 0. Tests will be designed to do the following:

1. Measure the individual's ability to understand and cope with radiation hazards that may be encountered on the job.

2. Stress the importance of being prepared for work in restricted areas.

71.27 3. Assess the individual's knowledge of and attitude toward his or her rights and obligations as a worker from the standpoint of radiation protection.

4. Reinforce the key points of the training.

The content of the health physics related training program will meet the intent of Regulatory Guide 8.27, Revision 0; Regulatory Guide 8.13, Revision 1; Regulatory Guide 8.29, Revision 0; and NUREG-0731.

The program content is detailed in Section 13.2, Training Program. Details of the Emergency Plan which meet the intent of NUREG-731, dated 1980, are given in Section 13.3, Emergency Planning.

Audits will be performed on all radiation protection procedures including those such as emergency procedures and instrument storage, 1.29 calibration, and maintenance procedures, in addition to the procedures specifically required by Regulatory Guide 1.33, Revision 2.

TABLE 12.5-1

MILLSTONE STATION PORTABLE HEALTH PHYSICS EQUIPMENT

DETECTOR TYPE	INSTRUMENT NAME	RADIATION DETECTED	SENSITIVITY RANGES	ACCURACIES	QUANTITY (IN FIELD USE)	STORED LOCATION	NOTES
Ion Chamber							
	RO-2	Beta/Gamma	0-5 R/hr	±20% full scale	46	Health Physics	(3 extra) emergency use
	RO-2A	Beta/Gamma	0-50 R/hr	±20% full scale	40	Health Physics	(23 extra emergency use
	RO-7	Beta/Gamma	0-20,000 R/hr	±20% full scale	1	Health Physics	
	CPMU	Gamma	0-1,000,000R/h	±20% full scale	3	Health Physics	
Geiger Mueller							
	E-130	Gamma	0-1 R/hr	±20% full scale	85	Health Physics	
	E-520	Gamma	0-2 R/hr	±20% full scale	35	Health Physics	(1 extra) emergency use
	E-530	Gamma	0-20 R/hr	±20% full scale	2	Health Physics	
	Teletector	Gamma	0-1000 R/hr	±20% full scale	36	Health Physics	(8 extra) emergency use
	Xetec	Gamma	0-1000 R/hr	±20% full scale	12	Health Physics	
	RM-14/HP210	Beta/Gamma	0-50,000 cpm	±20% full scale	41	Health Physics	(3 extra) emergency use

TABLE 12.5-1

MILLSTONE STATION PORTABLE HEALTH PHYSICS EQUIPMENT

DETECTOR TYPE	INSTRUMENT NAME	RADIATION DETECTED	SENSITIVITY RANGES	ACCURACIES	QUANTITY (IN FIELD USE)	STORED LOCATION	NOTES
●	L-177/HP210	Beta/Gamma	0-500,000 cpm	±20% full scale	31	Health Physics	(4 extra) emergency use
	E140N/HP210	Beta/Gamma	0-50,000 cpm	±20% full scale	12	Health Physics	(25 extra) emergency use
Pocket Ion Chambers							
	0-200 mR	Gamma	0-200 mR	±10% full scale	2000	Health Physics	
	0-500 mR	Gamma	0-500 mR	±10% full scale	1650	Health Physics	
	0-1 R	Gamma	0-1 R	±10% full scale	165	Health Physics	(50 extra) emergency use
	0-1.5 R	Gamma	0-1.5 R	±10% full scale	325	Health Physics	
●	0-2 R	Gamma	0-2 R	±10% full scale	575	Health Physics	
	0-5 R	Gamma	0-5 R	±10% full scale	90	Health Physics	
	0-100 R	Gamma	0-100 R	±10% full scale	60	Health Physics	
Portal Monitors							
	Gamma - 10	Gamma	~ 150 nCi	N/A	10	Controlled Access Areas	6-10 extra to be purchased

MNPS F.S.A.R.

TABLE 12.5-1

MILLSTONE STATION PORTABLE HEALTH PHYSICS EQUIPMENT

DETECTOR TYPE	INSTRUMENT NAME	RADIATION DETECTED	SENSITIVITY RANGES	ACCURACIES	QUANTITY (IN FIELD USE)	STORED LOCATION	NOTES
Cadmium Telluride							
	PR	Gamma	0-5 R/hr	±20% full scale	4	Health Physics	
	PR-2	Gamma	0-500 R/hr	±20% full scale	6	Health Physics	
	PR-2	Gamma	0-50,000 R/hr	±20% full scale	4	Health Physics	
Scintillation							
	43-2	Alpha	0-50,000 cpm	±20% full scale	30	Health Physics	
Proportional							
	PNR-4	Neutron	0-5 R/hr	±20% full scale	6	Health Physics	
Cadmium Telluride							
	Alarming Dosimeters	Gamma	Variable	±20% full scale	67	Health Physics	
Air Samplers							
	Various	- - -	- - -	- - -	95	Health Physics	

TABLE 12.5-1

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MILLSTONE STATION PORTABLE HEALTH PHYSICS EQUIPMENT

DETECTOR TYPE	INSTRUMENT NAME	RADIATION DETECTION	SENSITIVITY RANGES	ACCURACIES	QUANTITY (IN FIELD USE)	STORED LOCATION	NOTES
TLD							
	Beta/Gamma	Beta/Gamma	~10-2,000,000 mrem	Approx. ± 10% (Laboratory 2σ)	Approx. 1000/month (non outage) Approx. 4000/month outage	Dosimetry Issue Bldg.	
	Neutron	Neutron	~10-100,000 mrem	Approx. ± 20% (Laboratory 2σ)	As required	Dosimetry Issue Bldg.	
	Finger Ring	Gamma	~10-500,000 mrem	Approx. ± 20% (Laboratory 2σ)	As required	Dosimetry Issue Bldg.	

TABLE 12.5-2

HEALTH PHYSICS AND CHEMISTRY LABORATORY EQUIPMENT
MILLSTONE UNIT 3

Instrument	Radiation Detected	Detector	Quantity	Location
Gamma-spectroscopy system	Gamma	Ge(Li)	2	Counting room
Liquid scintillation counter	Beta	Photomultiplier tube	1	Counting room
Alpha-beta proportional counter	Alpha, beta	-	1	Health physics office
Scalers	Alpha, beta, gamma	Alpha probe, GM tube	2	Health physics and chemistry laboratories, and counting room
Pocket dosimeter charger	-	-	15	Health physics office and Calibration Repair Facility
Spectrophotometer	-	Photomultiplier tube	1	Chemistry laboratory
Gas chromatograph	-	Thermal conductivity cells	1	Chemistry laboratory
Ion analyzer	-	Specific ion electrodes	1	Chemistry laboratory
GM counter	Beta, gamma	GM tube	2	Counting room

TABLE 12.3-2

RADIATION MONITORING SYSTEM - AREA RADIATION DETECTOR LOCATION

Mark Number	Name	Building	Elevation	Range (mR/h)	Detector Type
3RMS-RE01	Sigma Refueling Machine	Containment	51' 4"	1 mR/h-1.0E+05mR/h	Gamma Scintillation (1)
3RMS-RE02	Fuel Transfer Tube	Containment	51' 4"	1 mR/h-1.0E+05mR/h	Gamma Scintillation (1)
3RMS-RE03	Incore Inst. Transfer Area	Containment	24' 6"	1 mR/h-1.0E+05mR/h	Gamma Scintillation (1)
3RMS*RE04	Containment High Range Internal	Containment	51' 4"	1 R/h-1.0E+07R/h	Ion Chamber (5)
3RMS*RE05	Containment High Range Internal	Containment	51' 4"	1 R/h-1.0E+07R/h	Ion Chamber (5)
3RMS-RE06	Decontamination Area	Fuel	24' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE07	Calibration Room	Auxiliary	66' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE08	Spent Fuel Pit Bridge/Hoist	Fuel	52' 4"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE09	Auxiliary Bldg General (A)	Auxiliary	18' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE10	Auxiliary Bldg General (B)	Auxiliary	4' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE11	Auxiliary Bldg General (C)	Auxiliary	4' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE12	Auxiliary Bldg General (D)	Auxiliary	24' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE13	Auxiliary Bldg General (E)	Auxiliary	24' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE14	Auxiliary Bldg General (F)	Auxiliary	24' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE15	Auxiliary Bldg General (G)	Auxiliary	43' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE16	Auxiliary Bldg General (H)	Auxiliary	43' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE17	Waste Disposal Bldg (A)	Waste Disp.	4' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE18	Waste Disposal Bldg (B)	Waste Disp.	4' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE19	Solid Waste Storage Area	Waste Disp.	24' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE20	Sample Room	Auxiliary	43' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE21	Laboratory	Service	24' 6"	0.01 mR/h-1.0E+03mR/h	Gamma Scintillation (3)
3RMS-RE22	Control Room	Control	47' 6"	0.01 mR/h-1.0E+03mR/h	Gamma Scintillation (3)
3RMS-RE23	Equipment Decon. Area	Service	24' 6"	0.01 mR/h-1.0E+03mR/h	Gamma Scintillation (3)

471.20

TABLE 12.3-2 (Cont)

Mark Number	Name	Building	Elevation	Range (mR/h)	Detector Type
3RMS-RE24	Waste Disposal Bldg (C)	Waste Disp.	24' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE25	Waste Disposal Bldg (D)	Waste Disp.	24' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS*RE26	RHR Cubicle "A" High Range	ESF	4' 6"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)
3RMS*RE27	RHR Cubicle "B" High Range	ESF	4' 6"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)
3RMS-RE28	Fuel Building Pipe Rack	Fuel	11' 0"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE29	Spent Fuel Cask Area	Fuel	52' 4"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS*RE30	Fuel Transfer Canal	Fuel	52' 4"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)
3RMS-RE31	Fuel Transfer Tube	Containment	24' 6"	1.0 mR/h-1.0E+05mR/h	Gamma Scintillation (1)
3RMS-RE32	Containment Air Compressor	Containment	24' 6"	1.0 mR/h-1.0E+05mR/h	Gamma Scintillation (1)
3RMS-RE33	RHR Cubicle "A" Normal Range	ESF	4' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE34	RHR Cubicle "B" Normal Range	ESF	4' 6"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE35	Incore Inst.Thimble Area	Containment	3' 8"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE36	Fuel Pool Monitor	Fuel	52' 4"	0.1 mR/h-1.0E+04mR/h	Gamma Scintillation (2)
3RMS-RE37	Condensate Demineralizer	Cond. Polishing	14' 6"	0.01 mR/h-1.0E+03mR/h	Gamma Scintillation (3)
3RMS-RE38	Regeneration Area	Cond. Polish	38' 6"	0.01 mR/h-1.0E+03mR/h	Gamma Scintillation (3)
3RMS*RE39	Personnel Access Hatch	Auxiliary	24' 6"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)
3RMS*RE40	Equipment Access Hatch	HRB	52' 4"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)
3RMS*RE41	Fuel Drop Monitor	Containment	51' 4"	0.1 R/h-1.0E+05R/h	Ion Chamber (5)
3RMS*RE42	Fuel Drop Monitor	Containment	51' 4"	0.1 R/h-1.0E+05R/h	Ion Chamber (5)
3RMS*RE43	Auxiliary Bldg Penetration	Auxiliary	4' 6"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)
3RMS*RE44	Containment Purge Penetration	Auxiliary	66' 6"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)
3RMS*RE45	RSS Cubicle "A"	ESF	-10' 0"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)
3RMS*RE46	RSS Cubicle "B"	ESF	-10' 0"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)
3RMS*RE47	Turbine Pump Steam Supply	ESF	21' 6"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)

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TABLE 12.3-2 (Cont)

Mark Number	Name	Building	Elevation	Range (mR/h)	Detector Type
3RMS*RE48	MS/Feedwater Penetrations	MSVB	49' 0"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)
3RMS*RE49	MS/Feedwater Penetrations	MSVB	49' 0"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)
3RMS*RE50	Recombiner Cubicle "A"	HRB	24' 6"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)
3RMS*RE51	Recombiner Cubicle "B"	HRB	24' 6"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)
3RMS*RE52	Recombiner Control Room	HRB	24' 6"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)
3RMS*RE53	Recombiner Sample Room	HRB	24' 6"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)
3RMS*RE54	Motor Control Center "A"	Auxiliary	24' 6"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)
3RMS*RE55	Motor Control Center "B"	Auxiliary	43' 6"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)
3RMS*RE56	Motor Control Center "C"	Auxiliary	24' 6"	0.1 R/h-1.0E+05R/h	Gamma Scintillation (4)

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NOTES:

1. Group 1 Area Monitors (Section 12.3.4.4.1)
2. Group 2 Area Monitors (Section 12.3.4.4.2)
3. Group 3 Area Monitors (Section 12.3.4.4.3)
4. Group 4 Area Monitors (Section 12.3.4.4.4)
5. Class 1E Area Monitors (Section 12.3.4.3)

SEALED SOURCE LEAK TEST PROCEDURE

Millstone Unit No. 3 will leak test sealed sources containing more than 100 microcuries of beta or gamma emitters or 5 microcuries of alpha emitters at 6 month intervals.

Each category of sealed sources (excluding start-up sources and fission detectors previously subjected to core flux) shall be tested as described below:

a. Source in Use

At least once per 6 months for all sealed sources containing radioactive material

1. Greater than 100 uCi beta/gamma emitters or greater than 5 uCi alpha emitters

2. With a half-life greater than 30 days (excluding Hydrogen-3)

3. In any form other than a gas

b. Stored Sources Not in Use

Each sealed source and fission detector shall be tested prior to use or transfer to another licensee unless tested within the previous 6 months. Sealed sources and fission detectors transferred without a certificate indicating the last test date shall be tested prior to being placed in use.

c. Start-Up Sources and Fission Detectors

Each sealed start-up source and fission detector shall be tested within 31 days prior to being subjected to core flux or installed in the core and following repair or maintenance to the source.

Sealed sources are classified into 3 groups according to their use, with surveillance requirements commensurate with the probability of damage to a source in that group. Those sources which are frequently handled are required to be tested more often than those which are not. Sealed sources which are continuously enclosed within a shielded mechanism (i.e., sealed sources within radiation monitoring or boron measuring devices) are considered to be stored and need not be tested unless they are removed from the shielded mechanism.

The sealed source leak test on by-product material will consist of rubbing paper disc swipes over an area of approximately 100 cm^2 per swipe along accessible surfaces of by-product source material and storage containers. The leak test is performed by Health Physics Technicians qualified to ANSI 18.1-1971.

For beta/gamma contamination assessment the paper swipes are read at a distance of 1/4" - 1/2" with a thin window (1.4 - 2.0 mg/cm^2) pancake GM instrument (i.e., RM-14/HP210T) with a typical efficiency of 10%. To be considered free of beta/gamma activity these swipes are required to be less than 1,000 dpm (i.e., 1,000 dpm/100 cm^2). Alpha surface contamination is determined by counting the paper swipes at a distance of approximately 1/8" using a thin window (1 mg/cm^2) zinc sulfide (Hg) scintillation probe connected to a count

rate meter (e.g., Eberline RM-14/Ludlum 43-2) with a typical efficiency between 25 - 30%. The alpha containment limit is 20 dpm/100 cm^2. Additional laboratory equipment such as multichannel gamma spectrometers and alpha surface barrier detectors are available to perform radionuclide spectrum analysis if required on contamination swipes.

Contamination measurements above the Northeast Utilities limits (1,000 dpm/100 cm^2 beta/gamma and 20 dpm/100 cm^2 alpha) on by-product material are immediately forwarded to the Health Physics Supervisor for appropriate action to assure the surveyed items are properly posted and controlled. If sealed sources are discovered to have removable contamination, Millstone Unit No. 3 will either decontaminate and repair the sealed source, or dispose of the sealed source in accordance with NRC regulations.

11. WASTE DISPOSAL

Northeast Utilities (NU), owner/operator of Connecticut Yankee (CY) and Millstone Unit Nos. 1, 2, and 3:

1. Maintains a current set of DOT and NRC regulations concerning the transfer, packaging and transport of low-level radioactive waste material.

2. Maintains a current set of requirements (license) placed on the waste burial firm by the agreement state of Nevada, South Carolina and Washington before packaging low-level radioactive waste material for transfer and shipment to the agreement state license.

3. Millstone Unit Nos. 1, 2, 3 has designated the Radiological Services Supervisor and Health Physics Supervisor for responsibility in ensuring safe transfer, packaging and transport of low-level radioactive material. The names of these individuals, their training, qualifications, and job description are listed in Part 7 of this application.

4. NU provides management approved, detailed operating procedures to all personnel involved in the transfer, packaging and transport of low-level radioactive material. Attention is given to the controls on the chemical and physical form of the low-level radioactive material and on the containment integrity of the packaging. NU, as owner/operator of 4 large commercial nuclear/electrical generator reactors, has over 17 years of nuclear experience (CY - commercial January 1968) in the preparation, packaging, waste classification, and safe transport for radioactive waste material. In 1984 NU shipped over 45,000 cubic feet of solid waste for burial and disposal.

5. NU provides initial training and periodic retraining in DOT and NRC regulatory requirements, the waste burial license requirements and company operating procedures for personnel involved in the transfer, packaging and transport of radioactive materials. Records of training dates, attendees and subject matter is retained on file.

6. NU provides initial training and periodic retraining to those employees who operate the processes that generate waste to ensure that the volumes of low-level radioactive waste are minimized. NU is committed to reduce the volume of rad-waste requiring land burial. The NU rad-waste reduction program includes:

   (a) Reduction in physical size of radiologically controlled areas on-site. This is done through decontamination of previously contaminated areas, better leak-path integrity control, more frequent surveillance, and increased training/awareness.

   (b) Minimization of amount of materials and supplies brought into radiologically controlled (contaminated) areas.

(c) Tradescraft segregation and Health Physics monitoring programs to distinguish rad material from non-rad material as it is being removed from radiologically controlled areas.

(d) Storage and reuse of "fixed" contaminated tools, equipment and supplies. Millstone Station maintains a contaminated tool warehouse for this purpose.

(e) The use of mechanical compressing and solidifying possesses on rad-waste materials is used to minimize rad-waste volume generation.

7. NU has established a management controlled audit program of all facets of rad-waste handling. The Millstone Station Quality Assurance Department, Corporate Auditing Branch and NU contracted outside contractor/vendor audit team maintain a periodic surveillance audit of the Millstone rad-waste program. The NRC and INPO also perform routine audits of the Millstone rad-waste program. The records of these audits are maintained on file for inspection.

REFERENCE 1

J.L. SHEPARD MANUFACTURER NOTES

FOR

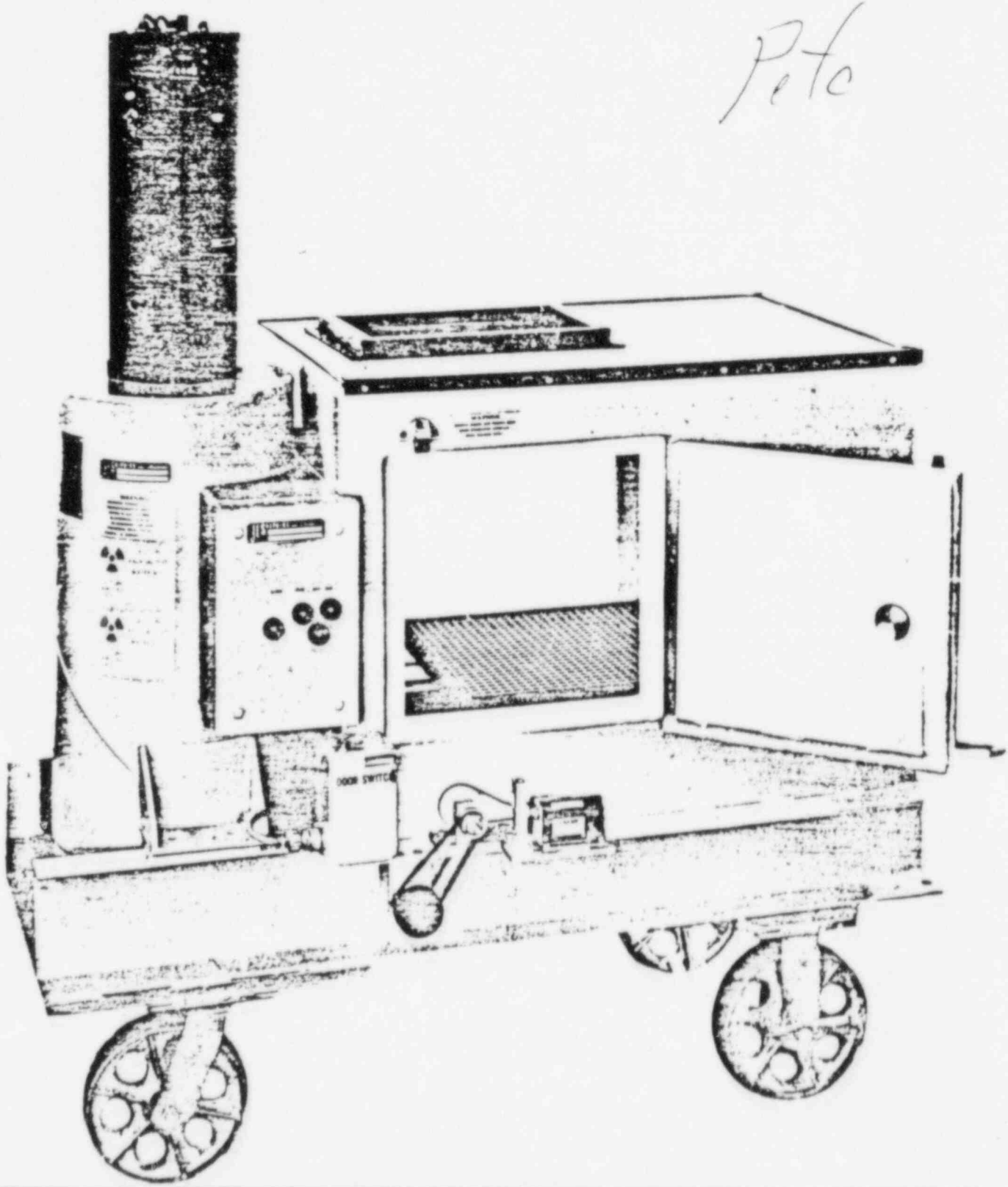
MODEL 89-400 CESIUM CALRIBRATOR

AND

MODEL 28-5 CESIUM BEDIN CALIBRATOR

MODEL 89 SHIELDED CALIBRATION RANGE

Pete



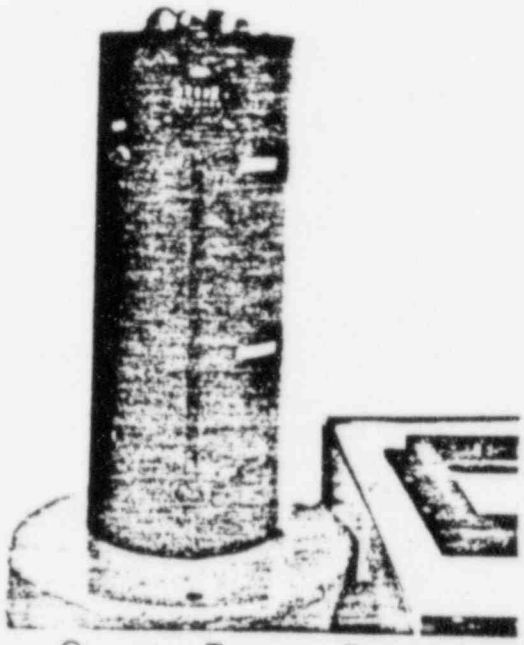
JL SHEPHERD and Associates
740 Salem St., Glendale, CA 91203
(213) 245-0187

MODEL 89 SHIELDED CALIBRATION RANGE

The Model 89 is a completely self-contained Shielded Calibration Range, designed to calibrate all types of portable radiation detection instruments, as well as remote area and other types of probes, with gamma radiation.

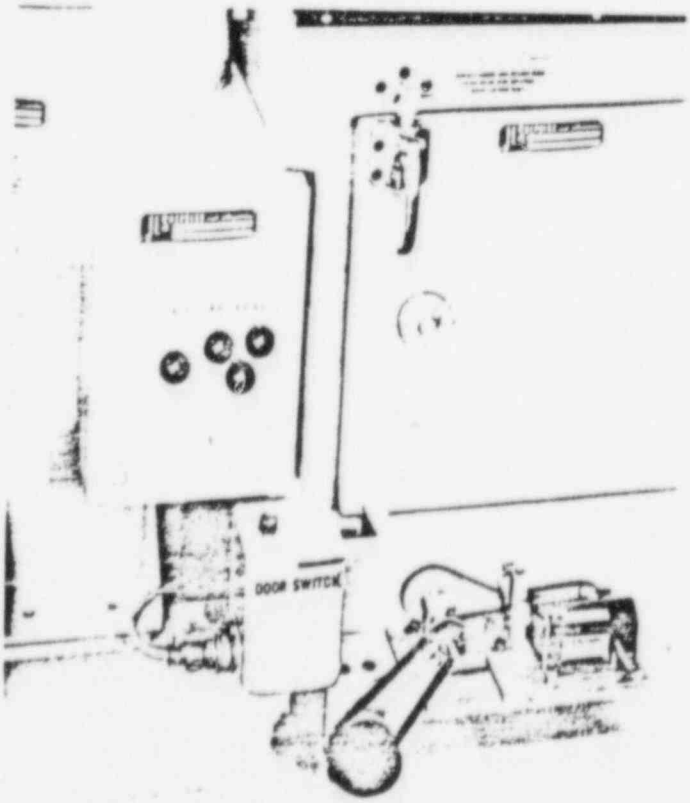
Two ^{137}Cs sources provide continuous calibration points; between 0.1 mR/hr and 20,000 R/hr, or greater, dependent upon the size of the primary source.

The unit is mounted on casters and may be used in any room without additional shielding. Radiation levels on the exterior of the device are $\leqslant$ 2 mR/hr average, $\leqslant$ 5 mR/hr maximum, in any operation mode.



Operating Tower — Detail

DESCRIPTION



Attenuator, Door Interlock,
Instrument Table Drive — Detail

The Model 89 consists of a dual source, manually operated, beam Calibrator with built-in attentuator system, which is mounted to a completely shielded calibration range equipped with a viewing window and access door. The sources and door are completely interlocked.

An engraved instrument table is built into the range. It provides both vertical adjustment to center the detector in the beam and longitudinal adjustment to vary source centerline between 300 mm and 500 mm to the center of the table. An external hand crank controls the longitudinal adjustment. A digital position indicator shows the position of the table centerline to $\pm$ 1 mm.

Access tubes, with removable lead shielding plugs, are provided for the calibration of Teletector type instruments, as well as to accomodate cables and plugs from probes used with Remote Area Monitoring Systems and other line-operated instruments. Standard location for access tubes is in the rear wall of the calibration box. They may be located in the front wall (door) on request.

MODEL NUMBERS, WITH ASSOCIATED SOURCE LOADINGS, AVAILABLE

All models incorporate a secondary source of 130 mCi. ^{137}Cs. Access tubes in all units, except Model 89-130, are located to deliver unattenuated dose rates of approximately 1100 R/hr and 800 R/hr, plus attenuated dose rates. The highest dose rate available in the Model 89-130, at this location, is 800 R/hr.

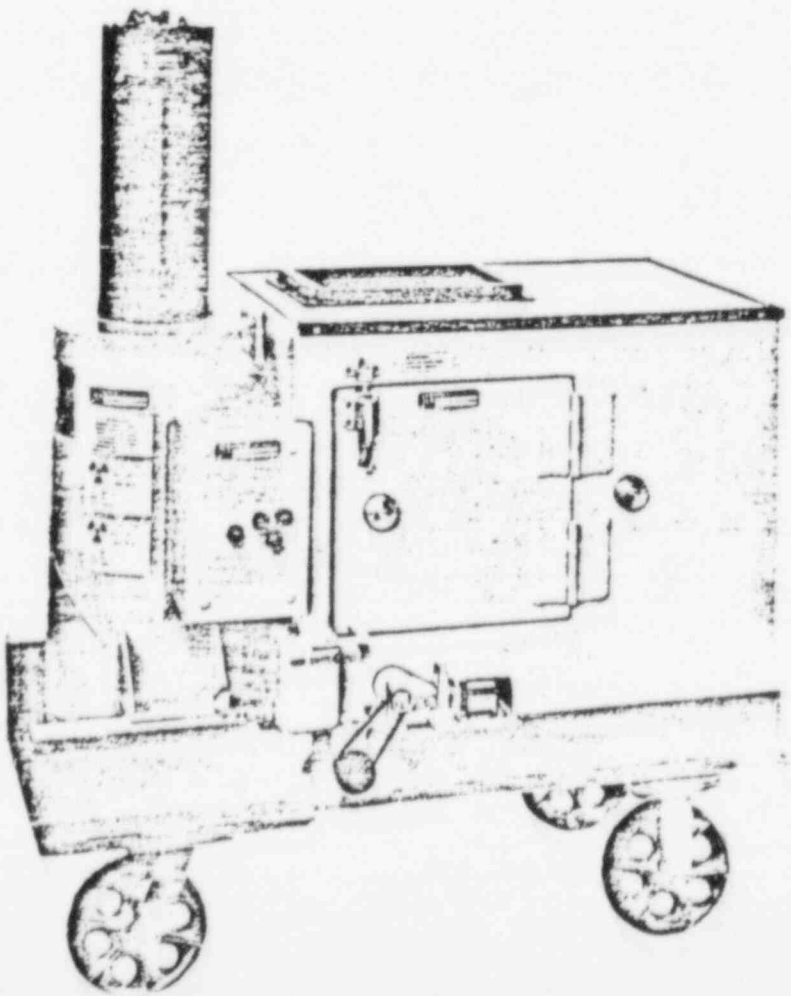
Complete calibration curves are provided with these units. All curves are taken at the source centerline.

The primary source has two sets of curves, one covering the 50-300 mm distance (0-0 on the calibration table), and the other including the 300-500 mm distance at the 0-0 point on the calibration table. The secondary source (130 mCi.) curves cover the 300-500 mm distance at the 0-0 point on the calibration table.

Note: The 50-190 mm calibration distance is within the collimator/beam port. A typical set of calibration curves for the Model 89-260 and a composite curve, showing typical calibration data in the 50-300 mm range, for all models are included in this data sheet.

MODEL	PRIMARY ^{137}Cs SOURCE*	DOSE RATE AT 305 mm POSITION**	20,000 R/hr CALIBRATION DISTANCE
89-130	130 Ci.	450 R/hr	42 mm
89-200	200 Ci.	700 R/hr	53 mm
89-260	260 Ci.	900 R/hr	61 mm
89-400	400 Ci.	1400 R/hr	79 mm

*All sources certified "Special Form".
**Continuous calibration points, 0.1 mR/hr to the 305 mm value, are provided in all models.



OPERATION AND SAFETY

With the source rod in the "Off" position, the operator opens the door of the calibration box, places the instrument to be calibrated on the instrument plate (with the center of the detector at the 0-0 location), adjusts the locating stops and turns the elevating handle (to center the detector in the beam, as shown by the scale built into the box). The door is then closed and the attenuators to be used are pushed forward to the "Attenuate" position; all other attenuators are pulled backward to the "Open" position. Source-detector distance is adjusted by a handle below the door, read on the digital indicator.

To expose either source, the operator presses the "Source Release" switch, raises the source operating handle and rotates it 15° to engage either source slot in the operating tower of the source-shield.

Both sources and the calibration box door are interlocked so that neither source can be raised when the door is open, and the door cannot be opened when either source is raised. Position of both sources is indicated by lights on top of the operating tower of the source-shield.

SPECIFICATIONS

ACCESS PORTS: 2 each, 1¾" diameter, with reducers to 1⅛" diameter, mounted in the rear wall (or door), at the dose rate positions shown in the Model Number Chart.

ATTENUATORS: A set of four sliding attenuators, nominal values X-2, X-4, X-10 and X-100, are built into the source-shield assembly. They may be operated individually, or in any combination.

BEAM ANGLE: The radiation field is 6½" × 6½" at the 306 mm calibration distance.

DOOR: Chamber door opening is 12" high × 12" wide.

ELAPSED TIMER: An elapsed timer, range 9999.9 seconds, accuracy ± 0.1 second, is engaged whenever either source is exposed.

INSTRUMENT PLATE: 14" × 15½", with engraved lines at 1 cm intervals. Two adjustable instrument locating stops are provided to precisely reposition instruments.

INSTRUMENT TABLE: The table is driven on roller bearings, by means of a stainless steel roller chain which also drives the five digit position indicator, which has ¼" readout and accuracy of ± 1 mm.

RING STAND: A ring stand is provided to hold Teletector type instruments, with probe inserted through the access port.

WINDOW: A lead glass viewing window, 8" × 12", is located in the top of the calibration box. A flourescent lamp, built into the calibration box, provides illumination.

DIMENSIONS: 24" wide × 48" long, with top of calibration range 36" above floor. Suggested working area is 36" × 60". Inside dimensions of the calibration box are 16" wide × 18" high × 25" long.

FABRICATION: The source-shield has a steel exterior, stainless steel source tube, all welded construction and meets DOT 7A specifications. The calibration box has a steel exterior and interior. All shielding is void free lead. All external surfaces are primed and painted blue. The interior of the calibration box is primed and painted white.

MOBILITY: The Calibrator is mounted on four heavy duty casters, with locks, and may be moved over any hard surface.

POWER: 115 volts, 60 Hz, rated at 5 amps.

WEIGHT: 3,200 pounds/1454 killograms.

MODEL 28-5 AND 28-6 BEAM CALIBRATORS FOR CALIBRATING INSTRUMENTS TO 4,000 mR/hr

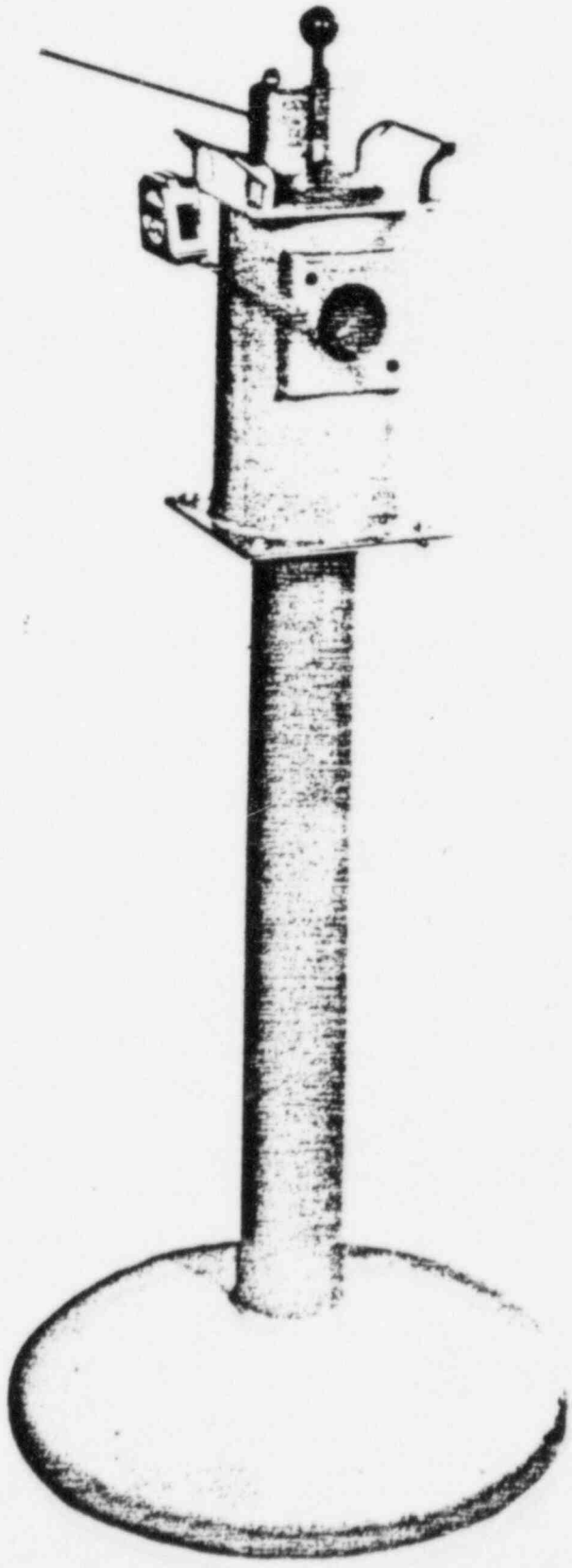
Model 28-5 and 28-6 are manually operated, Beam Calibrators, for calibrating all types of radiation detection instruments. Model 28-5 incorporates either a 120 or a 200 mCi. ^{137}Cs source. Model 28-6 incorporates either a 600 mCi. or a 1.2 Ci. ^{137}Cs source. A slip-on attenuator (X-10) is provided with all units. For additional details on Model 28's with loadings up to 130 Ci. ^{137}Cs, see the Beam Calibrator/Irradiator Catalog.

LOW EXTERNAL RADIATION LEVELS: ≤5 mR/hr (typically ≤ 2 mR/hr) at one foot from the surface, with the source in the "Off" position, and behind the Calibrator with the source in the "On" position.

OPERATION: The source is fixed to the end of the shielded operating rod; moved from the completely shielded "Off" position to the exposed "On" position by means of an operating handle, located on top of the unit. Source position indicating lights and a padlock to lock the source in the "Off" position, are provided for all units.

STAND: All units include a stand to provide a 36" beam height.

CC-6 COLLIMATOR OPTION: For use with Model 28-6A Calibrator. Provides constancy checks for 0.6 cc ionization/therapy chambers placed in contact with source-tube. Dose rate is approximately 10 R/min.



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