U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No.	50-443/94-01
Docket No.	50-443
License No.	NPF-86
Licensee:	North Atlantic Energy Service Corporation (NAESCO) Post Office Box 300 Seabrook, New Hampshire 03874
Facility Name:	Seabrook Station
Inspection Period:	January 3-7 through February 10, 1994

Inspectors: for Robert J. Bores 3/04/94
L. Eckert, Radiation Specialist — Date
Facilities Radiation Protection Section

Approved By: Robert J. Bores 3/04/94
Dr. R. Bores, Chief — Date
Facilities Radiation Protection Section

Areas Inspected: Changes in the radwaste organization; changes in the radiological controls organization; training and qualifications of personnel; implementation of the solid radwaste program; review of radioactive material shipping records; review of interim radwaste storage; scaling factor analysis; and contamination control.

Results: Radwaste and Radiological Controls staffing was sufficient to implement responsibilities. The solid radwaste and transportation programs were well implemented. The training program and scaling factor development program were good. Contamination control was good and helped the Dry Active Waste (DAW) minimization program to be a success. No radiological safety concerns or violations of NRC regulatory requirements were identified.

DETAILS

1.0 Personnel Contacted

1.1 Station Personnel

* M. Anderson, Radwaste Department Supervisor
R. Bergeron, Electrical Engineering Manager
* B. Cash, Health Physics (HP) Department Supervisor
B. Clark, Radiation Services Supervisor
D. Covill, Nuclear Quality Surveillance Manager
* W. DiProfio, Station Manager
* B. Drawbridge, Executive Director Nuclear Production
* S. Dodge, Radiation Services Department Supervisor
* R. Donald, Auditor
* T. Grew, Technical Training Manager
J. Grillo, Operations Manager
* M. Harvey, Staff Engineering Analyst
* J. Kwasnik, Principal Radiation Scientist
* W. Leland, Manager Chemistry and HP
G. McDonald, Nuclear Quality Manager
J. Peschel, Regulatory Compliance Manager
* J. Peterson, Maintenance Manager
* J. Rafalowski, Chemistry and HP Projects Supervisor
* P. Richardson, Director of Training
* D. Robinson, Senior Chemist
* J. Sobotka, NRC Coordinator
F. Straccia, Senior Health Physicist
L. Tardif, Senior Chemist
J. Tarzia, Senior Health Physicist
* R. Thompson, Technical Training Supervisor
* W. Walker, Radwaste Operations Shipping Supervisor
J. Warnock, NSA Manager

Other licensee personnel were contacted during the inspection.

1.2 NRC Personnel

* N. Dudley, Senior Resident Inspector
* R. Laura, Resident Inspector

* Denotes attendance at the exit meeting.

2.0 Audits and Appraisals

The most current audit (QA Audit 92-A03-01) and independent appraisal (February 11, 1993) were reviewed and discussed in NRC Inspection Report 50-443/93-04. This inspection report noted that the resolution of audit findings was thorough and prompt. Another audit of the licensee's process control program will be conducted later this year and will be reviewed in a future inspection. Since the licensee had not utilized shipping casks, there was no need (requirement) to conduct audits of vendor supplied services, programs, or facilities.

3.0 Chemistry and Health Physics Group Staffing/Organization and Management Control of the Radwaste Program

Since the last radiological controls program inspection, a new individual took the position of Radiation Protection Manager (RPM). This individual had served in the Radiation Protection Supervisor and Health Physics Supervisor positions for about fourteen years in addition to other health physics positions at other facilities. The inspector concluded that this individual met the licensee's technical specifications (TS) qualification requirements for the RPM position.

A Chemistry and Health Physics Projects Section has been created. This group is headed by the Chemistry and Health Physics Projects Supervisor. This individual had previously served as the RPM and is supported by two individuals. This group will assist the Chemistry and Health Physics Manager in the coordination of group commitments, business objectives, corrective actions, and goals.

The following personnel changes have occurred since the last inspection of this area.

- The Radwaste Coordinator was moved to Chemistry and HP Projects. Another individual, the Radiological Technical Specialist, was moved to this section from emergency preparedness.

- The HP Analyst who supports Planning and Scheduling now reports to the ALARA Supervisor. The change is intended to improve preparation for radiological work on both a short and long-range basis, improve the quality of job history files, and improve support of HP operations.

Otherwise, there was no turn-over of personnel within the radiological controls and radwaste organizations. These organizations have remained stable over the last several years. Attachments 1 and 2 provide organizational charts for the Chemistry and HP organization and Radwaste Department, respectively.

The RPM planned to make additional changes in program responsibilities and the inspector was informed that these changes would not likely take place until after the outage. One of the RPM's goals was to encourage professionalism among the HP technician staff.

While substantive support from upper level management was evident and the volume of generated radwaste was notably small during 1993, the inspector did not find evidence that senior level management had disseminated their expectations concerning the radwaste program to all personnel at the station. That is, a management goal was established for 1993, but the radwaste generation/minimization goal for 1993 was not disseminated, at least in written form, to station staff. The Chemistry and HP Manager informed the inspector that a Radwaste Minimization Steering Committee had been established with members outside the Chemistry and HP group to help provide better visibility to the Radwaste Department. The Chairman of this committee is the Director of Engineering and Licensing. The Chemistry and HP Manager conveyed that he expected greater senior level management attention to this program area as this committee will address radwaste processing and disposal issues and seek management support to enact solutions. This matter will be reviewed in future inspections.

In summary, the licensee radiological controls and radwaste organizations were stable and remained sufficiently staffed to carry out their assigned functions. Management control of the radwaste program was acceptable.

4.0 Training and Qualifications of Personnel

To determine if the licensee provides adequate training for those individuals responsible for preparing and certifying the adequacy of radioactive waste/materials shipments in accordance with 49 CFR 172, Subpart H, the inspector conducted interviews with Training Department and Radwaste Department personnel, and reviewed several pertinent lesson plans (LPs), and selected training records.

Licensee individuals who had the responsibility of verifying shipment adequacy attended a 56-hour contractor course (Waste Management Group {WMG}) on Department of Transportation (DOT) radioactive material transportation requirements. The inspector noted that Radwaste Department personnel continued to be provided with a good mix of in-house and vendor training. Training staff have attended a vendor-supplied Chem Nuclear Systems, Incorporated (CNSI) radwaste and transportation "train the trainer" course.

The draft Rad Waste Training Program Description was reviewed. This document provides a better-defined initial training program and delineates initial qualification courses, lessons, and job performance measures. The sequence of initial courses is also laid out in flow chart format. This document provides for three radwaste organization position levels, Assistant Radwaste Technician, Radwaste Technician, and Senior Radwaste Technician.

The licensee held Radwaste Curriculum Advisory Committee (CAC) meetings in accordance with Seabrook Nuclear Training Procedure NT-5000, "Training Design," 12/3/93. These meetings were held to review, design, and approve topics to be taught, the training matrix, program descriptions, training schedules, and terminal objectives. In summary, one of the main functions of this committee was to establish the program for requalification each year. In

practice, the licensee has provided and intends to provide DOT requirements training on a biennial basis.

The inspector reviewed the following Qualification Guides.

- RW0024Q, "CNSI Demineralizer System", 12/22/93
- RW0010Q, "Spent Filter Transfer Cask Operations", 12/22/93

The inspector reviewed the following Lesson Plans (LPs).

- RW1015I, "Spent Filter Transfer Cask", 4/3/91
- RW1027I, "Replacement of CNSI Demineralizer System Filters", 5/9/91
- RW1026I, "Operation of CNSI Demineralizer System", 7/30/91

Training records were reviewed for a Senior Radwaste Technician and a Radwaste Technician. These two individuals were properly qualified in accordance with existing Seabrook Station procedures.

This program area was assessed as being well implemented.

5.0 Implementation of the Radwaste Program

5.1 Description

NRC Inspection Report 50-443/93-04 provided a description on the radwaste processing equipment/capabilities. At the time of this inspection, no major modifications to radwaste processing systems had been completed.

NRC Inspection Report 50-443/93-04 noted that there was no permanent piping which would allow sluicing of spent resins from the condensate system demineralizer beds or from the steam generator blowdown system demineralizer bed to the Waste Handling Building. The licensee had also noted this condition as less than fully optimal. At the time of this inspection, the licensee had initiated a modification to install permanent piping to an Advanced Liquid Processing System (ALPS) demineralizer system. The modification will add an Area Radiation Monitor (ARM), and provide for automatic system shutdown on high radiation and overpressure. Also, an in-line sampler will be installed. This modification will be reviewed in greater detail upon its completion.

The licensee continued to utilize the services of Chem Nuclear Systems, Incorporated (CNSI) to demineralize water from Floor Drain Tanks (FDT). The Process Control Plan (PCP) for cement solidification has expired. No major changes to the resin dewatering PCP were noted.

5.2 Scaling Factors

To determine if 10 CFR 61.55(a)(8), "Determination of Concentrations in Wastes," had been met, the inspector conducted interviews, reviewed procedures, and reviewed relevant licensee documentation in this area.

As part of this inspection, the following procedures were reviewed by the inspector.

- CP 5.1, Revision 13, 11/1/93, "Isotopic Characterization of Radwaste"
- HD0958.38, Revision 20, 1/1/94, "Evaluation of Isotopic Mix"

No procedural inadequacies or major changes to these procedures were noted.

Licensee document, Chemistry Study/Technical Information Document (CHSTID) 92-0006, "Evaluation of 10 CFR 61 Data For Dry Active Waste", was previously reviewed and discussed in NRC Inspection Report 50-443/93-04.

Chemistry Procedure CP 5.1 specifies the methods to be utilized for isotopic characterization of radwaste streams. The procedure directs that scaling factors for Class B and Class C waste should be re-evaluated annually; Class A waste biennially. The licensee sent the 1992 samples to the Yankee Atomic Environmental Laboratory (YAEL) for the 10 CFR 61 analysis. The 1992 sample results showed detectable levels of Co-60 for the first time.

5.3 Radwaste Volume Reduction/Decontamination Efforts

Attachment 3 provides the volumetric amounts of wastes stored (after processing such as compaction) at Seabrook Station each year beginning with 1990. This information was gathered from licensee records. As noted in this attachment, 6,366 ft^3 of DAW, spent resin, and spent filters have been accumulated and stored. This is a notably small volume of generated waste.

The accumulation of Dry Active Waste (DAW) has been minimized by the radwaste department's volume minimization program. Attachment 4 summarizes the results of the licensee's DAW minimization program between 1991-1993. The licensee defines "pounds processed" as that material practical to sort, i.e., it is not the weight of material generated. "Percentage released" is the amount of material that meets the established monitoring criteria and is free- released.

Licensee document, Health Physics Study/Technical Information Document (HPSTID) 91-009, "Radiological Evaluation of Re-locating the Bartlett DAW Trailer", established criteria for DAW sorting. This study is the basis for establishing that the background in the DAW sorting trailer be maintained less than 25 micro-R/hour. In other words, if a bag of DAW is greater than this criterion, all of the items in that bag would be considered contaminated and no action to sort the bag of DAW would be taken. This study also provides the licensee's justification for moving the DAW sorting trailer to the protected area yard. No inadequacies in this study were noted.

One of the primary functions of the Seabrook Station Radwaste Department was contamination control. The inspector noted that the efforts taken in regards to minimizing RCA contaminated area square footage were good and had the added benefit of helping the DAW waste generation minimization program to be successful.

The inspector reviewed the licensee's painting program and the painting plan. The licensee's study was conducted to prioritize painting efforts at the station. Currently, the station painting program was the responsibility of the Maintenance Department. At this time, the impacts on decommissioning have not been studied. The study balanced ALARA, probability of becoming a high contamination area, and component degradation. The inspector suggested that the licensee should initiate a scoping review of a few areas that are contaminated or have a potential for high contamination to determine whether decommissioning impact is a valid input into the painting program/plan. Previous observations on the status of the licensee's painting program were noted in Section 4 of NRC Inspection Report 50-443/89-05.

5.4 Implementation of the Radwaste Program Summary

This program area was assessed as being well implemented.

6.0 Interim Radwaste Storage

6.1 Storage of Spent Resins

Information on the content of the polyethylene liners containing watered resins was readily available as required by 10 CFR 20. These records were maintained at the Health Physics access control point and Radwaste Department office.

NRC Inspection Report 50-443/93-04 noted that the storage of watered resins was not consistent with Updated FSAR (UFSAR) Section 11.4.2.6, "Storage Facilities". In summary, the licensee's safety analysis had addressed storage of processed wastes which differed from the practice of storing unprocessed wastes in the Waste Processing Building (WPB). The licensee has chosen to store resins unprocessed until shipping plans can be made. Also, the licensee found that storing resin in water allowed the polyethylene liners to be maintained in a vented configuration thereby precluding hydrogen gas buildup within the liners and providing an additional measure of safety regarding airborne contamination. In response to that inspection, the licensee initiated a 10 CFR 50.59 safety review to determine whether the noted storage of watered resins was bounded by past safety reviews. UFSAR Change Request (UFCR) No. 94-003 was initiated to better reflect licensee practice on the storage of unprocessed waste. The following change was made by UFCR 94-003; "Polyethylene plastic high integrity containers (HIC's) in steel overpacks are used to hold spent resins in the drum storage area of the Waste Processing Building. Because the HICs are contained in the steel overpacks the HICs are not a fire hazard and will not add to the combustible loading of the building."

The conclusion of the licensee's studies was that storage of non-processed resins did not involve an unreviewed safety question. HPSTID 93-008, "Radiological and Safety Evaluation for Storage of Spent Resin in Water in the Waste Processing Building", was reviewed. This document provided the licensee's evaluation in support of the study conclusions on this issue. The inspector stated that this action closed previously identified unresolved item (URI 50-443/93-04-01) relative to the storage of unprocessed resins.

6.1.1 Evaluation of Dose from Direct Radiation

The licensee's source term was based on 60 polyethylene liners (195 ft^3 each) whose radionuclide concentrations were based on 0.125% failed fuel. The licensee chose three receptor locations for the dose rate calculations including outside the WPB wall, the public education center, and the closest site boundary point. The licensee's calculation assumed 8,670 hours of exposure per year for the site boundary and 2,000 hours per year for the on-site areas with an occupancy factor of unity. Generic Letter 81-38 states that if off-site doses from on-site storage are sufficiently low, i.e., < 1 mrem/year, it is unlikely that the limits of 10 CFR 190 will be exceeded. Using the assumptions noted above, the dose rates at the public education center and site boundary were calculated to be less than 1 mrem/year in accordance with 10 CFR 20.1301. Attachments 5 and 6 are excerpts from HPSTID 93-008 summarizing the licensee's results.

6.1.2 Evaluation of Radioactive Material Release Potential

HPSTID 93-008 has recommended that actions be taken to minimize the likelihood of resin being introduced into the floor drain system. The inspector was informed in a February 22, 1994, telephone call that this recommendation would be implemented by placing a sock filter in the drain line.

HPSTID 94-001, "Site Boundary Dose From A Resin Fire In the WPB", evaluated the impact of a fire affecting five unprotected polyethylene liners. At the time of the inspection, four polyethylene liners filled with spent resin had been stored in the WPB. The total inventory for release was calculated using the highest activity liner in the WPB. It was assumed that the resulting fire would cause the WPB roof to fall. The duration of release was assumed to be one hour. The licensee used a release fraction of 10%. This is a conservative estimate for the isotopes of interest and was checked against release fractions contained in NRC Response Technical Manual - 93, NUREG BR-0150, Revision 3. The dose assessment results of 1.98E-3 rem total effective dose equivalent and 5.67E-4 rem to the thyroid led the licensee to conclude that a fire in the WPB involving liners with spent resin was not an unreviewed safety question. In order to eliminate future impacts of a fire in the WPB storage area, the licensee management have stated their intention to place stored polyethylene liners in steel overpacks. Also, this study recommended that no more than five liners containing resin without overpacks should be permitted in the WPB. The Radwaste Department Supervisor stated that this recommendation would be implemented by administrative controls.

6.1.3 Evaluation of Engineering Criteria

Licensee calculations estimated that 60 full 195-ft^3 liners would slightly exceed the design floor load. The licensee stated that administrative controls would be used to ensure that floor loading limits of the WPB will not be exceeded. Administrative controls will also be employed to ensure that liners filled with watered resins are not directly lifted by the polyethylene liner lifting eye, to avoid damage to the internal dewatering latiice structure. Also, controls will be emplaced to ensure that liners will not be stacked without first being placed in steel overpacks. The licensee was informed by the vendor, CNSI, that it was not advisable to stack polyethylene liners directly on top of one another for greater than 10 years. This was another reason why the licensee has chosen to use steel overpacks for all liners which will be stored in the WPB.

6.1.4 Summary

No inadequacies were noted regarding the licensee's conclusion that storage of unprocessed resins did not pose an unreviewed safety question. Licensee administrative controls concerning the storage of unprocessed resins will be reviewed in a future inspection.

6.2 DAW Storage

The Unit 2 side of the Service Water Cooling Tower continued to be used for interim on-site DAW storage.

The licensee has experienced deformation of some B25 and B88 LSA containers (clip hold-down lid style). This deformation has potentially compromised these LSA containers as strong-tight packages. At the time of the inspection, the licensee felt that since the licensee compacts DAW, the container deformation was due to re-expansion of compacted material and noted that there was no compensating compressive force on the containers as would exist had these containers been buried. The Radwaste Department Supervisor stated that the material in the deformed containers would be repackaged. Also, the Radwaste Department Supervisor stated that in the interim, they would cease to use the LSA containers with clip hold-down lids and, stated simply, use LSA containers that are stronger (containers similar to the IP2 type described by proposed Department of Transportation rules). In a telephone call initiated on February 22, 1994, to the Radwaste Department Supervisor, the inspector was informed that an engineering review request had been initiated to ensure that an acceptable LSA storage container will be used in the future. This engineering request will be reviewed in a future inspection.

7.0 Transportation of Radioactive Materials

Waste generators in the State of New Hampshire did not have radwaste burial privileges at the time of the inspection. Seabrook Station continued to store on site all low level radwaste generated since start-up. A number of non-burial site Low Specific Activity (LSA), Limited Quantity (LQ), and Instrument and Articles (I&A) shipments were made such as chemistry

samples and survey meters with intrinsic sources. The following shipment records were selected and reviewed.

Shipment Number	Type of Shipment	Activity (mCi)
93-001	LQ, RCS[1] sample	5
93-002	LQ, fourth quarter samples	0.9
93-003	I&A, neutron survey meter	1
93-004	LQ, first quarter samples	1.9
93-005	I&A, two incore detectors	1.6E-5
93-006	LSA, laundry	19
93-007	LQ, three sources	2.2E-5
93-008	LQ, two glass spheres	168
93-009	LQ, sample	1.9E-2
93-010	LQ, second quarter samples	2.6
93-012	LSA, laundry	30
93-016	LQ, phantom parts	-

These records were found complete. The licensee maintained copies of the consignee's licenses as required. No discrepancies were noted.

8.0 Exit Meeting

The inspectors met with licensee representatives at the end of the inspection, on January 7, 1994. The inspectors reviewed the purpose and scope of the inspection and discussed the findings. Licensee representatives emphasized that management goals had been established for the radwaste program and indicated their intent to ensure dissemination of their expectations concerning this program area. Overall, the licensee stated that they would evaluate the findings and institute additional actions as appropriate.

The licensee was informed in a February 22, 1994, telephone call that Unresolved Item 93-04-01 had been closed.

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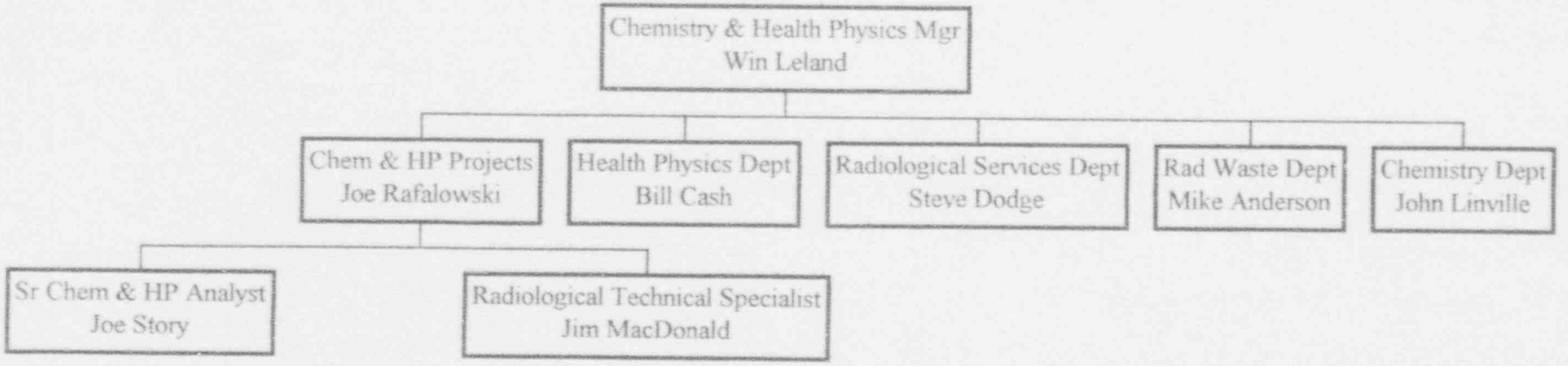
[1]Reactor Coolant System

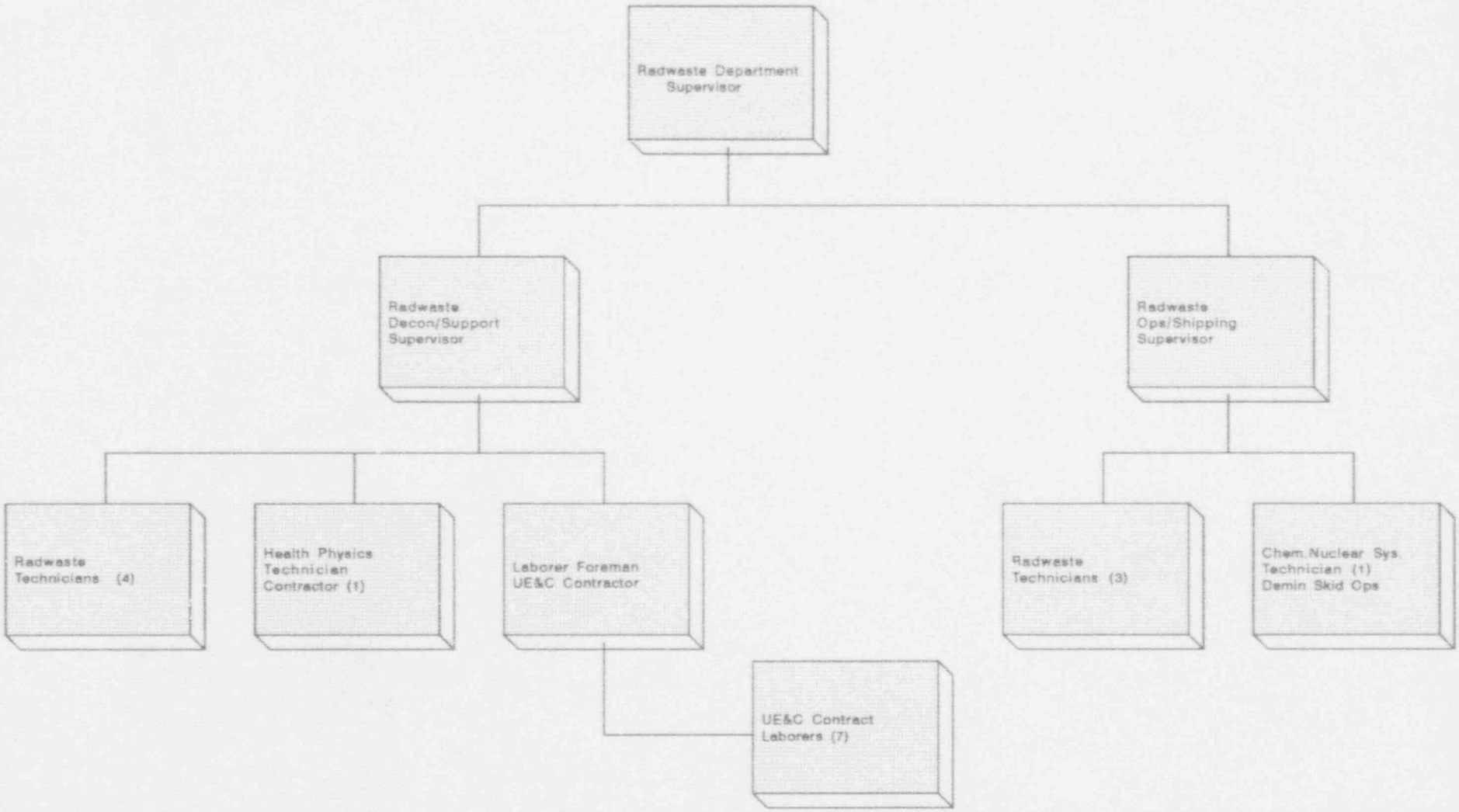
CHEMISTRY AND HEALTH PHYSICS GROUP

11/21/93



ATTACHMENT 1

Radwaste Department



ATTACHMENT 2

SEABROOK STATION

RADIOACTIVE WASTE GENERATION VOLUME

Type	1990		1991		1992		1993		Totals	
	Qty	Cu. Ft.	Qty	Cu.Ft.	Qty	Cu. Ft.	Qty.	Cu.Ft	Qty	Cu. Ft.
DAW	6	*576.0 ft3	21	*2016.0 ft3	24	*2304.0 ft3	5	*480.0 ft3	56	*5376. 0 ft3
Resin	1	205.8 ft3	2	411.6 ft3	1	205.8 ft3	0	0	4	823.2 ft3
Filters	0	0	1	83.4 ft3	1	83.4 ft3	0	0	2	166.8 ft3
Totals		781.8 ft3		2511. ft3		2593.2 ft3		480.0 ft3		6366.0 ft3

ATTACHMENT 3

Total Generation 6366 ft3 = 180.3 m3

*Material in Storage (Final Package and Classified) 5373.3 ft3/152.2 m3

1/6/94

DAW PROCESSING 1991 - 1993

YEAR	POUNDS PROCESSED	POUNDS RELEASED	PERCENTAGE RELEASED
1991	43,730	30,245	69%
1992	24,741	18,968	77%
1993	10,537	8,932	85%
TOTALS	79,008	58,145	74%

ATTACHMENT 4

January 6, 1994

ATTACHMENT F

MICROSHIELD DOSE RATE RESULTS
DUE TO CONTAINING SPENT RESINS
IN THE DRUM STORAGE AREA OF THE WPB

RECEPTOR	772-CENTIMETER SOURCE CONFIGURATION DOSE RATE (mr-hour^{-1})	965-CENTIMETER SOURCE CONFIGURATION DOSE RATE (mr-hour^{-1})
Outside WPB Wall	1.73×10^{-01}	2.28×10^{-01}
Public Education Center	3.46×10^{-05}	3.36×10^{-05}
Site Boundary	1.29×10^{-07}	1.25×10^{-07}

ATTACHMENT G

EXPECTED ANNUAL DOSES
DUE TO CONTAINING SPENT RESINS
IN THE DRUM STORAGE AREA OF THE WPB

RECEPTOR	772-CENTIMETER SOURCE CONFIGURATION ANNUAL DOSE (mr)	965-CENTIMETER SOURCE CONFIGURATION ANNUAL DOSE (mr)
Outside WPB Wall	3.46E2	4.56E2
Public Education Center	6.92E-2	6.72E-2
Site Boundary	1.13E-3	1.10E-3