New Hampshire
Yankee

NYE-92005

February 7, 1992

Mr. John Healey
United States EPA, Region I (WCC)
John F. Kennedy Federal Building
Boston, MA 02203

References: (a) NPDES Permit No. NH0020338

(b) EPA Letter dated January 9, 1992, D. A. Fierra, Director, Water Management Division, to T. C. Feigenbaum

Subject: Response to Request for Information

Dear Mr. Healey:

In a letter dated January 9, 1992 [Reference (b)], the United States Environmental Protection Agency (EPA) requested written information from New Hampshire Yankee (NHY) regarding the September 30, 1991 release of radionuclides from Seabrook Station to the Atlantic Ocean. Pursuant to Section 308 of the Clean Water Act, Enclosure 1 provides NHY's response to the EPA's specific requests for information.

As stated in the Enclosure, NHY has identified and quantified the radionuclides released as a result of the September 30, 1991 event and all subsequent decontamination activities. At no time during or after this event were any radionuclides released to the Atlantic Ocean in excess of the limits stipulated by the Nuclear Regulatory Commission and the Seabrook Station Operating License. Additionally, at no time were any radionuclides released to the Browns River. During and after this event, NHY undertook conservative measures to ensure impact on the environment was minimized. It is noted that an NRC inspection at Seabrook Station subsequent to September 30, 1991, documents NHY's compliance with NRC regulations regarding radioactive release limits. The NRC also concluded that there was no negative impact on the environment or to the public health and safety as a result of this event.

If you have any questions regarding the enclosed response, or should you wish to meet with NHY to further discuss the enclosed information, please contact Mr. James M. Peschel, Regulatory Compliance Manager, at (603) 474-9521, extension 3772.

Very truly yours,

R. Jeb DeLoach

R. Jeb DeLoach
Executive Director -
Engineering and Licensing

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RESPONSE TO EPA REQUEST FOR INFORMATION

In a letter dated January 9, 1992, the United States Environmental Protection Agency (EPA) requested information from New Hampshire Yankee (NHY) regarding the September 30, 1991 monitored but unplanned release of radioactivity from Seabrook Station to the Atlantic Ocean. The following provides the EPA's specific questions and NHY's responses.

Question No. 1

Specify the type(s) of radioactive pollutants(s) discharged into the Atlantic Ocean, or other receiving waters, from NHY's outfalls at the Seabrook power plant as a result of the above-identified problems that took place on or around September 30, 1991. In specifying the type(s) of radioactive pollutants discharged, NHY should also identify whether such pollutant(s) are considered to be source, byproduct or special nuclear materials under the Atomic Energy Act, or some other type of radioactive material.

Response No. 1

Table 1 lists the types of radionuclides that were discharged into the Atlantic Ocean (Outfall 001) as a result of the September 30, 1991 event and all subsequent decontamination activities. No radionuclides were released to the Browns River or any other receiving waters as a result of this event or any of the clean up activities. The radionuclides listed in Table 1 are all byproduct materials. 10 CFR 20.3 defines byproduct materials as any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material. Source materials are defined as uranium or thorium, or any combination thereof. Special nuclear materials are defined as plutonium, uranium 233, uranium enriched in the isotope 233 or in the isotope 235. No source materials or special nuclear materials were released as a result of this event.

Question No. 2

As to the radioactive pollutants identified in No. 1 above, specify the amounts and concentrations of each type of radioactive pollutant discharged on or around September 30, 1991 as a result of the above-identified problems that took place on that date. Include in your response any monitoring data that may have been collected documenting such amounts or concentrations of radioactive pollutants.

Response No. 2

Table 1 provides the total number of Curies (Ci) of radionuclides that were released to the Atlantic Ocean (Outfall 001) during the event on September 30, 1991, and the amounts that were released during subsequent decontamination activities conducted in October, November and December 1991. Tables 2, 3, 4, 5 and 6 provide the same information for each of the individual release paths to the Circulating Water System and hence the Atlantic Ocean. Specifically, Table 2 contains the total amount of radionuclides released through the Waste Test Tanks; Table 3 for the Steam Generator Blowdown Holdup Sump; Table 4 for

the Turbine Building Sump; Table 5 for the Demineralized Water Storage Tanks; and Table 6 for the Oil/Water Separator Vault No. 2. The sum of the amounts of radionuclides presented in Tables 2, 3, 4, 5 and 6 are the total amounts presented in Table 1.

Table 7 provides the average concentrations of radionuclides (microcuries/ml) that were released to the Atlantic Ocean (Outfall 001) during the event on September 30, 1991, and during the subsequent decontamination activities. The average radionuclide concentrations presented in Table 7 were obtained by dividing the total amount of each radionuclide that was released during the subject period by the total volume of water discharged through the Circulating Water System for the same period. It should be noted, however, that the concentrations presented in Table 7 are mathematical averages of the total release for the period, and that individual batch releases during the same period each had specific concentrations. For example, concentrations of certain radionuclides may have been higher when a specific system was flushed or when a hold-up tank was drained, and lower when these activities were not being performed. Notwithstanding this, as described below, at all times during this event, and during the subsequent decontamination activities, NHY was in full compliance with the radionuclide concentration limits stipulated by the Nuclear Regulatory Commission.

The radionuclides released via the above stated flow paths were measured by extensive sampling and analysis at each specific location. During the period of September 30 through December 12, 1991, it is estimated that over 500 samples were analyzed for radionuclide content. The sampling data are maintained in a coded format on magnetic computer tape at Seabrook Station. Due to the voluminous nature and coded format of the subject data, hard copies are not provided with this response. This data is available for review at Seabrook Station.

Question No. 3

As to the types of radioactive pollutants identified in No. 1 above, specify which, if any, of such pollutants are subject to regulation by the Nuclear Regulatory Commission (NRC). If any such NRC regulation applies, specify the discharge limitations imposed on that pollutant by the NRC and the legal basis for such limitations. Also provide copies of any applicable license(s) issued by the NRC to NHY through which such limitations are imposed.

Response No. 3

All of the radionuclides identified in Response No. 1 above, are subject to regulation by the Nuclear Regulatory Commission (NRC). The Seabrook Station Unit No. 1 Facility Operating License (NPF-86), contains as Appendix A thereto the Seabrook Station Technical Specifications. Technical Specification 3.11.1.1 contains the Limiting Conditions for Operation regarding the concentration of radioactive liquid effluents. This specification states that the concentration of radioactive materials released in liquid effluents at the point of discharge from the multiport diffusers in the Atlantic Ocean (Outfall 001) shall be limited to those concentrations specified in 10 CFR Part 20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, Technical Specification 3.11.1.1 states that the concentration shall be limited to 2×10^{-4} microcuries/ml total activity. This latter concentration limit is not applicable since

no noble gases were released as part of this event. A copy of the Seabrook Station Unit No. 1 Facility Operating License (NPF-86), and applicable excerpts from the Seabrook Station Technical Specifications are included as Attachment A.

The radionuclide concentration limits specified in 10 CFR Part 20, Appendix B, Table II, Column 2, have been listed on Table 7. As stated above, Table 7 contains the average concentrations of radionuclides released during the September 30, 1991 event, and the averages during each month of the decontamination process. Comparison of each of these average effluent radionuclide concentrations with those of the limits stated in 10 CFR Part 20, Appendix B, demonstrate that the liquid effluent releases resulting from this event were in full compliance with, and in all cases were several orders of magnitude lower than the radionuclide concentration limits stipulated by the NRC.

The Seabrook Station Technical Specifications also contain dose limits pertaining to radioactive liquid effluent releases. Technical Specification 3.11.1.2 states that the dose or dose commitment to a member of the public from radioactive materials in liquid effluents released to unrestricted areas (i.e., areas outside the site boundary) shall be limited 1) during any calendar quarter to less than or equal to 1.5 mrems to the whole body and to less than or equal to 5 mrems to any organ; and, 2) during any calendar year to less than or equal to 3 mrems to the whole body and to less than or equal to 10 mrems to any organ. The cumulative dose contributions from liquid effluents for calendar quarters and calendar years are determined in accordance with the methodology and parameters contained in the Seabrook Station Offsite Dose Calculation Manual, which has been reviewed and approved by the NRC.

Table 8 provides the cumulative doses from liquid releases that hypothetically could have been received by a member of the public in unrestricted areas on September 30, 1991 and during the months of October, November and December 1991. This table provides both the total body dose and the maximum organ dose. Table 8 also provides the same information for the fourth quarter of 1991 and for calendar year 1991. These calculated cumulative doses are all less than one one-thousandth of the dose limits mandated by the NRC and Technical Specification 3.11.1.2.

The NRC performed an assessment of the September 30, 1991 event in Inspection 91-29. This assessment, which is documented in NRC Inspection Report 91-29 (Attachment B hereto), specifically included the offsite effects from this event. In Section 3.1 of this report, the NRC noted that they had reviewed NHY's results of sampling analyses and radiological dose assessment. The NRC stated that all measurement results for liquid effluent samples including storm drain water, settling basin water, Browns River water, and ocean water were all less than the lower limits of detection. The NRC also reviewed NHY's dose assessment as of the time of inspection and stated that the projected doses were less than one percent of the monthly Technical Specification limits.

Based on the review of NHY's radiation measurement techniques, analytical results, and actions, the NRC determined that: 1) NHY has an excellent capability to accurately measure gamma emitters; 2) NHY's actions to monitor the possible leakage to the environment was excellent; and 3) NHY has the capability to perform the necessary radiological dose assessment. The NRC concluded that there was no negative impact on the environment or to the public health and safety as a result of this event.

Question No. 4

Describe in detail the events that caused the discharges of radioactive pollutants to the Atlantic Ocean, and any other receiving waters, on or around September 30, 1991. Include in this description an explanation of why the radioactive pollutants were discharged to the Atlantic Ocean or other receiving waters and a description of any treatment which the contaminated water received prior to discharge.

Response No. 4

The following provides a description of the September 30, 1991 event and subsequent decontamination activities, and a summary of pertinent plant conditions at the time of the event.

A. Description of the Event

On Monday, September 30, 1991 at 1830 the Control Room was notified that the Demineralized Water (DM) System was potentially contaminated. Two workers who had been cleaning in the Radiologically Controlled Area (RCA) using water drawn from the emergency shower station at the north end of the Primary Auxiliary Building (PAB), had come to the Health Physics control point where they were determined to be contaminated. One worker was contaminated on his shoes and hands while the other worker was contaminated on his shoes and clothes. Health Physics surveys indicated that the bucket of water was reading 8 mR/hr and the shower head was reading 10 mR/hr.

The Demineralized Water System had been contaminated by reactor coolant at the letdown radiation monitor skid (RM SKID-88). Specifically, the contamination flow path was the Letdown Gross Activity Monitor (RM-6520) purge line. This purge line normally provides a DM backflush of the radiation detectors following any build up of radioactivity on the detectors. Confirmation that this flow path was the source of contamination was provided by the 12 mR/hr. reading at the DM supply line to the Letdown Radiation Monitor. This was the highest reading found on the DM System. It was discovered that the DM isolation valve (DM-V-301) to RM SKID-88 was in the open position. This manual isolation valve was immediately closed on September 30, 1991 at 2000.

Two conditions must occur to allow the aforementioned contamination flow path to be established. First, DM manual isolation valve DM-V-301 has to be open, and second, reverse flow has to occur past solenoid valve RM-RV-6520-2. Solenoid valve RM-RV-6520-2, which is located on the RM SKID-88, is normally closed in a deenergized state and prevents DM from entering the Reactor Coolant System (RCS). As to the first condition necessary to establish this flow path, it was determined that DM manual isolation valve DM-V-301 was placed in the open position during the restoration of a tagout on September 18, 1991. The tagging restoration was performed following maintenance on the Chemical and Volume Control System (CVCS) letdown line radiation monitor. The tagging restoration sheet was completed solely by reference to valve position information contained in a computerized tagging database. At this time the database was under development, and not intended to be used to determine system restoration valve position. The appropriate valve lineup procedure should have been used to determine correct valve position.

As stated above, the second condition necessary to establish the contamination flow path was reverse flow past solenoid valve RM-RV-6520-2. In order to determine the conditions that would allow flow past this solenoid valve, the NHY I&C Department tested two identical solenoid valves to determine the amount of reverse differential pressure that would cause the valve to open. The maximum differential pressure was 1.1 psi. Therefore, for reverse flow to occur either the RCS pressure has to increase above the DM System header pressure or the DM System pressure has to be lower than the RCS fluid pressure. The pressure downstream of CS-PCV-7493 (pressure control valve to the skid) was subsequently measured to be 88 psi with a flow of 7.8 gpm with the Residual Heat Removal (RHR) and RCS letdown system in the configuration described in the initiating conditions described in Section B below. The DM System pressure at DM-V-301, with the DM pumps throttled to 60 psi discharge pressure, was calculated to be 54 psig. This supports the conclusion that reverse flow was caused by a decrease in DM system pressure below the RCS letdown fluid pressure.

Utilizing the above data the possible RCS letdown flow into DM System was calculated for the event. Based on a DM System pressure of 60 psig, measured at DM-PI-3445, a letdown flow of 3.1 gpm into the DM System and 4.7 gpm into the Volume Control Tank (VCT) was calculated for the event. This resulted in a calculated total flow of 1116 gallons of letdown into the DM System. This value corresponds to the volume of RCS that was lost during this event as estimated by make up volume and a comparison of VCT and Pressurizer level changes during the 6 hour time frame.

B. Initiating Conditions

The following provides a summary of the pertinent plant conditions at the time of this event:

- Mode 5 (Cold Shutdown), RCS pressure 250 psig, RCS Temperature 170°F
- Residual Heat Removal (RHR) Train B in service
- Charging and letdown are shutdown
- Feed and bleed on Secondary Component Cooling Water (SCCW) in progress
- On September 28, 1991 at 1830, Centrifugal Charging Pump CS-P-2B is placed in service with the RHR system providing RCS letdown. In this configuration the RHR system takes a suction on the RCS and supplies letdown flow to the Chemical and Volume Control System. The charging pump takes a suction on the Volume Control Tank (VCT) and discharges back to the RCS.
- On September 30, 1991, one of the plant tasks was to refill the A and C steam generators. This task was completed by the use of the Startup Feedwater Pump FW-P-113 by taking a suction on the Condensate Storage Tank (CST) and discharging to the steam generators. At 1050 the DM System was aligned to refill the CST to compensate for the steam generator fill. This was accomplished by throttling DM-V-517 and maintaining 60 psig on DM-PI-3445. This fill lineup was continued until 1616 when it was secured.

- At 1223 the Turbine Building sump radiation monitor went into alert and at 1228 it went into alarm. The monitor reading at this point was 4.53×10^{-6} µCi/ml. The abnormal procedure was entered and a sample of the Turbine Building sump was taken. The chemistry results identified no detectable activity in the Turbine Building sump. The abnormal procedure was exited and the Technical Specification ACTION statement was entered to allow the radiation monitor to be inspected. At this time Chemistry began monitoring the Turbine Building sump by taking grab samples.

- At 1830 the Control Room was notified by Health Physics of potential DM System contamination.

- At 1915 the Turbine Building sump radiation monitor went into alarm again. At 1925 Chemistry reported a Turbine Building sump sample of 2.83×10^{-5} µCi/ml. The radiation monitor setpoints were adjusted to reflect the radioactivity analysis of the sample taken from the sump. This allowed the Turbine Building sump pumps to be run.

- During the time period that the Steam Generators were being filled, the DM System pressure was 60 psig with the letdown fluid pressure at 88 psig. This was sufficient differential pressure to provide motive force to contaminate the DM System back to the Turbine Building.

C. Effluent Treatment and Discharges

All discharges of radionuclides on September 30, 1991, and during decontamination activities which continued until December 14, 1991, were made to the Atlantic Ocean (Outfall 001) via the Circulating Water System. No radionuclides were discharged to the Browns River (Outfall 002), or the Sewage Treatment Facility (Outfall 021). The EPA release points that directed radionuclides to the Atlantic Ocean included Oil/Water Separator Vault No. 2 (Outfall 023), Oil/Water Separator Vault No. 1 (Turbine Building Sump; Outfall 022), and the Steam Generator Blowdown Recovery Regeneration Sump and the Liquid Waste System (Outfall 025). These discharges are further defined in the Offsite Dose Calculation Manual (ODCM) as follows:

ODCM Release Point	EPA Pathway
Oil/Water Separator Vault No. 2	023 to 001
Turbine Building Sump	022 to 001
Demineralized Water Storage Tank No. 2	001
Steam Generator Blowdown Waste Holdup Sump	025 to 001
Waste Test Tank	025 to 001

The source of radioactivity and the treatment provided for each of these specific pathways is described below.

1. Oil/Water Separator Vault No. 2 (Outfall 023)

Oil/Water Separator Vault No. 2 receives influent from drains in the Auxiliary Boiler Room. This influent was contaminated by the DM header and by flushing operations conducted during cleanup activities. The effluent from Oil/Water Separator Vault No. 2 was redirected to the Turbine Building Sump and discharged through Oil/Water Separator Vault No. 1 (Outfall 022), which incorporates an in-line radiation monitor. At the direction of NHY management all effluent in this flow path was limited to a maximum concentration of 1×10^{-5} µCi/ml. Effluent exhibiting activity above this limit was redirected to the Liquid Radioactive Waste System for further treatment and release through the Waste Test Tanks (Outfall 025).

2. Turbine Building Sump (Outfall 022)

The Turbine Building Sump receives influent from secondary plant drains. This influent was contaminated by the DM header and by flushing operations conducted during cleanup activities. The Turbine Building Sump had also received some influent from Oil/Water Separator Vault No. 2 (Outfall 023) as a result of this event and the subsequent decontamination activities. The effluent from the Turbine Building Sump was released through Oil/Water Separator Vault No. 1 (Outfall 022) unless activity exceeded 1×10^{-5} µCi/ml, at which point it was diverted to the Liquid Radioactive Waste System for further treatment and release through the Waste Test Tanks (Outfall 025).

3. Demineralized Water Storage Tanks (Outfall 025)

The Demineralized Water Storage Tanks received contaminated influent directly from the DM System header. Due to the volume of water in these tanks (445,000 gallons), and the ability to isolate these tanks from the DM System without affecting system operations, a vendor skid was utilized to reduce tank activity from 1×10^{-5} to 1×10^{-7} µCi/ml prior to release to the Circulating Water System (Outfall 001).

4. Steam Generator Blowdown Waste Holdup Sump (Outfall 025)

Steam Generator Blowdown Waste Holdup Sump received contaminated influent when the DM System headers in the Primary Auxiliary Building were flushed. Effluent from the Steam Generator Blowdown Waste Holdup Sump was continuously monitored by an in-line radiation monitor and was released to the Circulating Water System (Outfall 001).

5. Waste Test Tanks (Outfall 025)

The Waste Test Tanks received contaminated influent when the DM System headers in the Primary Auxiliary Building were flushed. Flow from the Turbine Building Sump was also redirected to the Waste Test Tanks when the activity was greater than 1×10^{-5} µCi/ml. These flows were in addition to those received during normal plant operation. Effluent from the Waste Test Tanks was treated before entering the tanks by a Chem-Nuclear skid that employed both filtration and ion exchange. Effluent from the Waste Test Tanks also passed a continuous radiation monitor and was discharged to the Circulating Water System (Outfall 001).

In addition to the in-plant discharge radiation monitoring activities discussed above, NHY conservatively had Yankee Atomic Electric Company analyze ocean water samples taken

near the offshore discharge diffuser nozzles. This analysis did not identify any detectable radioactivity in the ocean above what is normal and expected from natural background.

There are a total of four discharge flowpaths that have the potential to discharge effluent into the Browns River (Outfall 002). These flowpaths, which include the Sewage Treatment Facility (Outfall 021), Stormwater Runoff, Oil/Water Separator Vault No. 3 (Outfall 024), and Chemical Cleaning (Outfall 026), are all directed to the Settling Basin prior to discharge to the Browns River. Of these four flowpaths only the Stormwater Runoff had the potential to become contaminated by the DM System. The Sewage Treatment Facility is supplied by the Potable Water System, the Chemical Cleaning System has not yet been utilized during power operation, and Oil/Water Separator Vault Number 3 receives influent from systems supplied by the Potable Water System. Specifically, Oil/Water Separator Vault Number 3 receives influent from the Auxiliary Boiler Fuel Oil Storage Tank area, the Fire Pump House Day Tank area, and the Fire Pump House drainage trench. Sample analysis of water from Oil/Water Separator Vault Number 3, during this event and the subsequent decontamination activities, indicated that no contamination was received from these sources.

On October 10, 1991, NHY took an additional conservative measure by diverting the Unit 1 Protected Area stormwater system flow to the Circulating Water System via a temporary pump and hoses. As stated above, the normal flowpath for this stormwater flow is to the Settling Basin. This bypass was implemented to ensure that the Settling Basin would continue to remain contamination-free by isolating it from any potential sources of slightly contaminated DM water within the Unit 1 Protected Area. The Unit 1 Protected Area stormwater was also periodically sampled to ensure that NRC radionuclide limits were not exceeded. The EPA was informed about the aforementioned bypass via teleconference on October 11, 1991 and via letter on October 18, 1991 (NYE-91021).

NHY also analyzed effluent samples from the Settling Basin and the results indicated that radionuclide concentrations were less than the lower limits of detection. This confirmed that Oil/Water Separator Vault Number 3, as well as the other flowpaths that discharge into the Settling Basin did not receive any contaminated flow, and hence no radionuclides were directed to the Browns River. NHY also had Yankee Atomic Electric Company analyze samples from the Browns River as an additional conservative measure to ensure that no radionuclides were discharged to that flow path. The results show no evidence of radioactivity in the Browns River.

TABLE 1

TOTAL AMOUNT OF RADIONUCLIDES RELEASED TO THE ATLANTIC OCEAN

ACTIVITIES IN CURIES	SEPTEMBER 30 1991	OCTOBER 1991	NOVEMBER 1991	DECEMBER* 1991
ANTIMONY-124	ND	8.39E-04	4.64E-05	ND
ANTIMONY-125	ND	4.44E-03	8.00E-04	ND
CESIUM-137	ND	ND	6.85E-05	ND
COBALT-57	6.64E-06	ND	ND	ND
COBALT-58	5.13E-03	6.78E-02	8.05E-03	1.74E-03
COBALT-60	1.46E-04	1.84E-03	6.04E-04	1.87E-04
IRON-55	5.99E-05	ND	1.64E-03	4.81E-04
IRON-59	ND	2.59E-04	2.82E-04	1.82E-06
MANGANESE-54	9.72E-05	3.60E-03	1.05E-04	2.92E-05
NIOBIUM-95	ND	3.67E-05	2.53E-05	ND
TRITIUM	7.58E-03	3.15E+01	1.16E+01	2.46E+00

ND = NONE DETECTABLE
* 12/1 THROUGH 12/12

NOTE: 8.39E-04 = .000839

TABLE 2

RADIONUCLIDES RELEASED FROM THE WASTE TEST TANKS

ACTIVITIES IN CURIES	SEPTEMBER 30 1991	OCTOBER 1991	NOVEMBER 1991	DECEMBER* 1991
ANTIMONY-124	NR	8.39E-04	4.64E-05	ND
ANTIMONY-125	NR	4.44E-03	8.00E-04	ND
CESIUM-137	NR	ND	ND	ND
COBALT-57	NR	ND	ND	ND
COBALT-58	NR	5.87E-03	1.15E-03	1.33E-04
COBALT-60	NR	1.61E-04	1.15E-04	1.72E-05
IRON-55	NR	ND	1.45E-03	3.89E-04
IRON-59	NR	5.26E-05	2.82E-04	1.82E-06
MANGANESE-54	NR	2.42E-03	5.43E-05	3.68E-06
NIOBIUM-95	NR	ND	2.53E-05	ND
TRITIUM	NR	2.90E+01	1.06E+01	1.97E+00

TABLE 3

RADIONUCLIDES RELEASED FROM THE STEAM GENERATOR HOLDUP SUMP

ACTIVITIES IN CURIES	SEPTEMBER 30 1991	OCTOBER 1991	NOVEMBER 1991	DECEMBER* 1991
ANTIMONY-124	NR	ND	ND	ND
ANTIMONY-125	NR	ND	ND	ND
CESIUM-137	NR	ND	ND	ND
COBALT-57	NR	ND	ND	ND
COBALT-58	NR	2.88E-03	7.19E-05	9.48E-06
COBALT-60	NR	8.69E-05	ND	ND
IRON-55	NR	ND	1.89E-04	9.19E-05
IRON-59	NR	ND	ND	ND
MANGANESE-54	NR	3.63E-05	ND	ND
NIOBIUM-95	NR	ND	ND	ND
TRITIUM	NR	2.40E+00	9.81E-01	4.78E-01

ND = NONE DETECTABLE
NR = NO RELEASE
* 12/1 THROUGH 12/12

TABLE 4

RADIONUCLIDES RELEASED FROM THE TURBINE BUILDING SUMP

ACTIVITIES IN CURIES	SEPTEMBER 30 1991	OCTOBER 1991	NOVEMBER 1991	DECEMBER* 1991
ANTIMONY-124	ND	ND	ND	ND
ANTIMONY-125	ND	ND	ND	ND
CESIUM-137	ND	ND	6.85E-05	ND
COBALT-57	6.64E-06	ND	ND	ND
COBALT-58	2.19E-03	5.72E-02	5.21E-03	7.88E-04
COBALT-60	5.42E-05	1.52E-03	4.89E-04	5.27E-05
IRON-55	2.10E-05	ND	ND	ND
IRON-59	ND	2.06E-04	ND	ND
MANGANESE-54	2.42E-05	1.07E-03	2.54E-05	1.40E-05
NIOBIUM-95	ND	3.67E-05	ND	ND
TRITIUM	3.86E-03	1.10E-01	ND	1.11E-02

TABLE 5

RADIONUCLIDES RELEASED FROM THE DEMINERALIZED WATER STORAGE TANKS

ACTIVITIES IN CURIES	SEPTEMBER 30 1991	OCTOBER 1991	NOVEMBER 1991	DECEMBER* 1991
ANTIMONY-124	NR	NR	NR	ND
ANTIMONY-125	NR	NR	NR	ND
CESIUM-137	NR	NR	NR	ND
COBALT-57	NR	NR	NR	ND
COBALT-58	NR	NR	NR	5.18E-04
COBALT-60	NR	NR	NR	4.34E-05
IRON-55	NR	NR	NR	ND
IRON-59	NR	NR	NR	ND
MANGANESE-54	NR	NR	NR	1.15E-05
NIOBIUM-95	NR	NR	NR	ND
TRITIUM	NR	NR	NR	1.95E-03

ND = NONE DETECTABLE
NR = NO RELEASE
* 12/1 THROUGH 12/12

TABLE 6

RADIONUCLIDES RELEASED FROM OIL/WATER SEPARATOR VAULT NO. 2

ACTIVITIES IN CURIES	SEPTEMBER 30 1991	OCTOBER 1991	NOVEMBER 1991	DECEMBER* 1991
ANTIMONY-124	ND	ND	ND	ND
ANTIMONY-125	ND	ND	ND	ND
CESIUM-137	ND	ND	ND	ND
COBALT-57	ND	ND	ND	ND
COBALT-58	2.94E-03	1.81E-03	1.62E-03	2.88E-04
COBALT-60	9.22E-05	6.39E-05	ND	7.38E-05
IRON-55	3.89E-05	ND	ND	ND
IRON-59	ND	ND	ND	ND
MANGANESE-54	7.30E-05	7.16E-05	2.52E-05	ND
NIOBIUM-95	ND	ND	ND	ND
TRITIUM	3.72E-03	ND	ND	ND

ND = NONE DETECTABLE
* 12/1 THROUGH 12/12

TABLE 7

AVERAGE CONCENTRATIONS OF RADIONUCLIDES

ACTIVITIES IN MICROCURIES/ml	SEPTEMBER 30 1991	OCTOBER 1991	NOVEMBER 1991	DECEMBER* 1991	10CFR20 APPENDIX B
ANTIMONY-124	NR	1.30E-11	6.94E-13	ND	2E-05
ANTIMONY-125	NR	6.87E-11	1.20E-11	ND	1E-04
CESIUM-137	ND	ND	1.02E-12	ND	2E-05
COBALT-57	6.49E-12	ND	ND	ND	4E-04
COBALT-58	5.01E-09	1.04E-09	1.20E-10	6.50E-11	9E-05
COBALT-60	1.43E-10	2.84E-11	9.03E-12	6.98E-12	3E-05
IRON-55	5.85E-11	ND	2.45E-11	1.79E-11	8E-04
IRON-59	ND	4.00E-12	4.21E-12	6.79E-14	5E-05
MANGANESE-54	9.51E-11	5.57E-11	1.57E-12	1.09E-12	1E-04
NIOBIUM-95	ND	5.68E-13	3.78E-13	ND	1E-04
TRITIUM	7.41E-09	4.87E-07	1.72E-07	9.18E-08	3E-03

ND = NONE DETECTABLE
NR = NO RELEASE
* 12/1 THROUGH 12/12

TABLE 8

CUMULATIVE DOSES FROM LIQUID RELEASES

PERIOD	TOTAL BODY DOSE (mrem)	MAX ORGAN DOSE (mrem)
SEPT. 30, 1991	4.92E-05	2.19E-04
OCTOBER 1991	4.03E-04	1.69E-03
NOVEMBER 1991	1.16E-04	5.52E-04
DECEMBER 1991	4.16E-05	2.04E-04
4TH QUARTER 1991 DOSE TOTALS	5.61E-04	2.45E-03
1991 ANNUAL TOTALS	9.56E-04	4.47E-03

TECHNICAL SPECIFICATION 3.11.1.2 LIMITS

QUARTERLY: TOTAL BODY DOSE: 1.5 mrem
MAX ORGAN DOSE: 5.0 mrem

YEARLY: TOTAL BODY DOSE: 3.0 mrem
MAX ORGAN DOSE: 10.0 mrem

ATTACHMENT A TO NYE-92005

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE, ET AL.*

DOCKET NO. 50-443

SEABROOK STATION, UNIT NO. 1

FACILITY OPERATING LICENSE

License No. NPF-86

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for a license filed by Public Service Company of New Hampshire, acting for itself and as agent and representative of the 11 other utilities listed below and hereafter referred to as licensees, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations set forth in 10 CFR Chapter I, and all required notifications to other agencies or bodies have been duly made;

   B. Construction of the Seabrook Station, Unit No. 1 (the facility) has been substantially completed in conformity with Construction Permit No. CPPR-135 and the application, as amended, the provisions of the Act, and the regulations of the Commission;

   C. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the regulations of the Commission (except as exempted from compliance in Section 2.D below);

   D. There is reasonable assurance: (i) that the activities authorized by this operating license can be conducted without endangering the health and safety of the public and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I (except as exempted from compliance in Section 2.D below),

   E. Public Service Company of New Hampshire is technically qualified to engage in the activities authorized by this license in accordance with the Commission's regulations set forth in 10 CFR Chapter I;

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*Public Service Company of New Hampshire is authorized to act as agent for the: Canal Electric Company, Connecticut Light and Power Company, EUA Power Corporation, Hudson Light & Power Department, Massachusetts Municipal Wholesale Electric Company, Montaup Electric Company, New England Power Company, New Hampshire Electric Cooperative, Inc., Taunton Municipal Lighting Plant, The United Illuminating Company, and Vermont Electric Generation and Transmission Cooperative, Inc., and has exclusive responsibility and control over the physical construction, operation and maintenance of the facility.

F. The licensees have satisfied the applicable provisions of 10 CFR 140, "Financial Protection Requirements and Indemnity Agreements," of the Commission's regulations;

G. The issuance of this license will not be inimical to the common defense and security or to the health and safety of the public;

H. After weighing the environmental, economical, technical, and other benefits of the facility against environmental and other costs and considering available alternatives, the issuance of Facility Operating License No. NPF-86 subject to the conditions for protection of the environment set forth in the Environmental Protection Plan attached as Appendix B, is in accordance with 10 CFR 51 of the Commission's regulations and all applicable requirements have been satisfied; and

I. The receipt, possession, and use of source, byproduct, and special nuclear material as authorized by this license will be in accordance with the Commission's regulations in 10 CFR 30, 40, and 70.

2. Based on the foregoing findings and the Commission's Memorandum and Order, CLI-90-03 (March 1, 1990), Facility Operating License No. NPF-67 is superseded by Facility Operating License No. NPF-86, which is hereby issued to Public Service Company of New Hampshire, et al. (the licensees), to read as follows:

A. This license applies to the Seabrook Station, Unit 1, a pressurized water nuclear reactor and associated equipment (the facility), owned by the licensees. The facility is located in Seabrook Township, Rockingham County, on the southeast coast of the State of New Hampshire, and is described in the licensees' "Final Safety Analysis Report," as supplemented and amended, and in the licensees' Environmental Report, as supplemented and amended.

B. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses:

(1) Public Service Company of New Hampshire (PSNH), pursuant to Section 103 of the Act and 10 CFR 50, to possess, use and operate the facility at the designated location in Rockingham County, New Hampshire, in accordance with the procedures and limitations set forth in this license;

(2) The licensees to possess the facility at the designated location in Rockingham County, New Hampshire, in accordance with the procedures and limitations set forth in this license;

(3) PSNH, pursuant to the Act and 10 CFR 70, to receive, possess, and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;

(4) PSNH, pursuant to the Act and 10 CFR 30, 40, and 70, to receive, possess, and use at any time any byproduct, source, and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

(5) PSNH, pursuant to the Act and 10 CFR 30, 40, and 70, to receive, possess, and use in amounts as required any byproduct, source, or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

(6) PSNH, pursuant to the Act and 10 CFR 30, 40, and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility authorized herein.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

PSNH is authorized to operate the facility at reactor core power levels not in excess of 3411 megawatts thermal (100% of rated power).

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. PSNH shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) Human Factors Engineering (Section 18, SSER 7)*

Before startup following the first refueling outage, PSNH shall resolve the following remaining Safety Parameter Display System issues:

(a) Perform system availability calculations including Reactor Vessel Level Indication System and Radiation Data Management System and provide a report to the staff.

(b) Perform system load test under heavily loaded plant conditions and provide a report of the evaluation to the staff.

D. Exemptions

PSNH is exempted from the Section III.D.2(b)(ii) containment airlock testing requirements of Appendix J to 10 CFR 50, because of the special circumstances described in Section 6.2.6 of SER Supplement 5 and authorized by 10 CFR 50.12(a)(2)(ii) and (iii) (51 FR 37684 October 23, 1986).

NRC Materials License No. SNM-1963, issued December 19, 1985, granted an exemption pursuant to 10 CFR 70.24 with respect to requirements for criticality alarms. PSNH is hereby exempted from provisions of 10 CFR 70.24 insofar as this section applies to the storage and handling of new fuel assemblies in the new fuel storage vault, spent fuel pool (when dry), and shipping containers.

These exemptions, authorized by law, will not present an undue risk to the public health and safety and are consistent with the common defense and security. These exemptions are hereby granted pursuant to 10 CFR 50.12. With the granting of these exemptions, the facility will operate, to the extent authorized herein, in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission.

E. Physical Security

PSNH shall fully implement and maintain in effect all provisions of the physical security, guard training and qualification, and safeguards contingency plans, previously approved by the Commission and all amendments and revisions to such plans made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p) including amendments and revisions made pursuant to provisions of the Miscellaneous

*The parenthetical notation denotes the section of the Safety Evaluation Report (SER) and/or its supplements (SSER) wherein the license condition is discussed.

Amendments and Search Requirements of 10 CFR 73.55. The plans which contain Safeguards Information protected under 10 CFR 73.21, are entitled: "Seabrook Station Physical Security Plan," with revisions submitted through June 9, 1988; "Seabrook Station Security Training and Qualification Plan," with revisions submitted through November 4, 1987; and "Seabrook Station Safeguards Contingency Plan," with revisions submitted through May 19, 1987. Changes made in accordance with 10 CFR 73.55 shall be implemented in accordance with the schedule set forth therein.

F. Fire Protection

PSNH shall implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report, the Fire Protection Program Report, and the Fire Protection of Safe Shutdown Capability Report for the facility, as supplemented and amended, and as approved in the Safety Evaluation Report, dated March 1983; Supplement 4, dated May 1986; Supplement 5, dated June 1986; Supplement 6, dated October 1986; Supplement 7 dated October 1987; and Supplement 8 dated May 1989 subject to the following provisions: PSNH may make changes to the approved fire protection program without prior approval of the Commission, only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

G. Reporting to the Commission

Except as otherwise provided in the Technical Specifications or Environmental Protection Plan, PSNH shall report any violations of the requirements contained in Section 2.C of this license in the following manner: Initial notification shall be made within 24 hours to the NRC Operations Center via the Emergency Notification System, with written followup within 30 days in accordance with the procedures described in 10 CFR Part 50.73(b), (c), and (e).

H. Financial Protection

The licensees shall have and maintain financial protection of such type and in such amounts as the Commission shall require in accordance with Section 170 of the Atomic Energy Act of 1954, as amended, to cover public liability claims.

I. Effective Date and Expiration

This license is effective as the date of issuance and shall expire at midnight on October 17, 2026.

FOR THE NUCLEAR REGULATORY COMMISSION

Thomas E. Murley, Director
Office of Nuclear Reactor Regulation

Attachments/Appendices:
1. Appendix A - Technical Specifications (NUREG-1386)
2. Appendix B - Environmental Protection Plan

Date of Issuance: MAR 15 1990