



Boston Edison

10 CFR 50.73

Pilgrim Nuclear Power Station
Rocky Hill Road
Plymouth, Massachusetts 02360

E. T. Boulette, PhD

Senior Vice President — Nuclear

November 4, 1996
BECo Ltr. #96-093

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Docket No. 50-293
License No. DPR-35

The enclosed Licensee Event Report (LER) 96-010-00, "Technical Specification Required Composite Analysis not Always Performed for Neutralizing Sump Discharges", is submitted in accordance with 10 CFR Part 50.73.

In this letter, the following commitment is made:

- Revise applicable procedures to require all Neutralizing Sumps to be sampled for radioactivity prior to release.

Please do not hesitate to contact me if there are any questions regarding this report.


E.T. Boulette, PhD

RLC/dmc/9601000

cc: Mr. Hubert J. Miller
Regional Administrator, Region I
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475 Allendale Road
King of Prussia, PA 19406

Sr. NRC Resident Inspector - Pilgrim Station

Standard BECo LER Distribution

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LICENSEE EVENT REPORT (LER)

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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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PILGRIM NUCLEAR POWER STATION

DOCKET NUMBER (2)

05000-293

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TITLE (4)

Technical Specification Required Composite Analysis not Always Performed for Neutralizing Sump Discharges

EVENT DATE (5)			LER NUMBER (6)		REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
10	03	96	96	010	00	11	04	96	N/A	05000
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR: (Check one or more) (11)										
OPERATING MODE (9)		N	20.402(b)		20.45(c)		50.73(a)(2)(iv)		73.71(b)	
POWER LEVEL (10)		100	20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)	
			20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER	
			20.405(a)(1)(iii)		x 50.73(a)(2)(i)(B)		50.73(a)(2)(viii)(A)		(specify in Abstract below and in Text, NRC Form 366A)	
			20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)			
			20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)			

LICENSEE CONTACT FOR THIS LER (12)

NAME

Robert L. Cannon - Senior Compliance Engineer

TELEPHONE NUMBER (Include Area Code)

508-830-8321

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	NO	EXPECTED SUBMISSION DATE(15)	MONTH	DAY	YEAR
X					

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On October 3, 1996, it was determined that certain Neutralizing Sump liquid discharges were made from March 1986 to September 1994 without certain analyses being performed as specified by Technical Specification 4.8.A.1 (liquid effluents concentration) and Table 4.8-1 (radioactive liquid waste sampling and analysis program). Composite analyses from each batch discharge are specified to be performed monthly and quarterly. Before September 1994, the composite analyses were performed only if gamma radiation was detected in Neutralizing Sump samples that were taken prior to discharge to the discharge canal.

The root cause of not performing the specified composite analyses was a programmatic deficiency. Specifically, the scope of the procedure was not sufficient to ensure meeting the technical specification requirements that apply to the post-discharge composite analyses of non-treatable liquids from the Neutralizing Sump. Composite analyses were performed only if gamma radiation was detected in a liquid sample taken from the Neutralizing Sump prior to discharge.

A corrective action program document was written on October 4, 1996, to document that the Neutralizing Sump discharges did not always have the analyses performed as required by technical specifications. This was discovered by an NRC inspector during an effluents program inspection conducted during the period September 30, 1996, to October 4, 1996.

Immediate corrective action was taken to issue a standing order to require all Neutralizing Sumps to be sampled for radioactivity prior to release. To preclude recurrence, the applicable procedures will be revised to require all Neutralizing Sumps to be sampled for radioactivity prior to release.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

BACKGROUND

The Technical Specification 4.8.A.1 requires that the radioactive content of each batch of radioactive liquid waste to be discharged be determined prior to release by sampling and analysis in accordance with Table 4.8-1. For non-treatable releases, e.g., the Neutralizing Sump, the table specifies sampling for each batch, a composite for each batch, and a composite from each batch. For each batch, the table specifies analysis for principal gamma emitters, iodine (I-131), and dissolved and entrained gases prior to release. For the composite for each batch, the table specifies a monthly composite analysis for H-3 (tritium) and gross alpha. For the composite from each batch, the table specifies a quarterly composite analysis for Sr-89, Si-90 and Fe-55. Technical Specifications 4.8.A.1 and Table 4.8-1 were part of license amendment 89 that added radiological effluents and environmental monitoring to the Pilgrim Station technical specifications in March 1986. The specification and table have not been changed since 1986.

Procedure 7.9.2 (currently rev. 36), "Liquid Radioactive Waste Discharge," governs the preparation of a discharge permit for treatable or non-treatable liquid radioactive wastes from Pilgrim Station. Procedure 7.9.5 (currently rev. 11), "Waste Neutralizing Sump Discharge Procedure," governs the discharge of the Neutralizing Sump (used in conjunction with 7.9.2 if required).

From the time of license amendment 89 (March 1986) through August 1994, the determination of Neutralizing Sump radioactivity was based solely on gamma activity. Past data indicated that the appearance of non-gamma emitters would only be expected if detectable gamma activity was present.

On August 24, 1994, it was discovered that tritium levels in a Neutralizing Sump that had been discharged as radioactive were higher than expected. The source of the elevated tritium was surmised to be from a previously documented reactor feed pump (RFP) seal leak (PR94.9201). During plant operation, the leak allowed feedwater to enter the turbine building closed cooling water (TBCCW) system. In order to maintain TBCCW system surge tank level, excess water was drained to the Neutralizing Sump. This, in turn, resulted in detectable tritium levels in the Neutralizing Sump. Because the source of the tritium was then realized and a previous problem report had been written for the RFP seal leak, no additional problem report was written. We recognize that this was a missed opportunity to identify the deviation from required technical specification requirements. At the time of the discovery in August 1994 it was recognized that:

- As a result of the elevated tritium, the additional tritium activity and corresponding doses resulting from previous discharges that occurred during the time frame of the RFP seal leak(s) would need to be evaluated and documented in the "Semiannual Radioactive Effluent and Waste Disposal Report."
- The previous practice of determining if the Neutralizing Sump liquid was radioactive based on gamma results could not be used in these new conditions. As a result, all subsequent Neutralizing Sump discharges were considered radioactive and sampled in accordance with Procedure 7.9.2

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Assuming all subsequent Neutralizing Sump discharges were radioactive (due to the RFP leak) resulted in full compliance with technical specifications. It was not recognized at the time of the RFP seal leak that the previous assumption for determining if the Neutralizing Sump was radioactive, i.e., gamma radiation in liquid sample, was not in full compliance with technical specifications.

During the period of September 30, 1996, to October 4, 1996, a scheduled NRC inspection of the Pilgrim Station radiological effluents program was conducted.

EVENT DESCRIPTION

On October 3, 1996, the NRC inspector questioned whether certain liquid discharges from the Neutralizing Sump from March 1986 to September 1994 were made without performing composite analyses specified by Technical Specification 4.8.A.1 and Table 4.8-1. Specifically, the composite analyses were performed only if gamma radiation was detected in a sample taken from the Neutralizing Sump prior to discharge. Conversely, the composite analyses were not performed if gamma radiation was not detected in a sample taken from the Neutralizing Sump prior to discharge. As a result of the inspection finding, the problem was documented via a corrective action program document (PR 96.9525) on October 4, 1996.

At the time of discovery on October 3, 1996, the plant was operating at 100 percent power with the reactor mode switch in the RUN position. The reactor vessel pressure was 1029 with the reactor vessel water temperature at the saturation temperature for the reactor pressure.

CAUSE

The cause of not performing the specified composite analyses was a programmatic deficiency. The deficiency was caused by the insufficient translation of Technical Specification Table 4.8-1 into the procedure(s) when the specifications were added in March 1986. The deficiency was due to a belief that if gamma radiation was not detected in the liquid sample, then the sample, and hence, the Neutralizing Sump did not contain radioactive material. Tritium (H-3), gross alpha, strontium (Sr-89 and Sr-90) and iron (Fe-55) are listed in Table 4.8-1 for composite analysis. These are not gamma emitters but are listed in 10 CFR Part 20 Appendix B table II column 2 as radionuclides, i.e., radioactive materials.

EXTENT OF THE PROBLEM

Since September 1994, composite sampling and analyses for non-gamma radioactivity as required by Technical Specifications Table 4.8-1 has been performed on all Neutralizing Sump discharges. However, this was done as a matter of practice and was not a procedural requirement.

Between April 1993 and September 1994, neutralizing sump discharges were made which contained tritium, but did not have composite analyses performed. All such releases were re-evaluated and the resulting doses were assessed. These subsequent dose assessments concluded that doses actually decreased due to additional dilution flow. The conclusion of negligible dose impact was included in the July - December 1994 semi-annual radioactive effluent and waste report.

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Between March 1986 (when the technical specifications table was implemented) and April 1993 (prior to the reactor feed pump leaks), composite analyses were not performed on those Neutralizing Sump batch releases considered clean (non-radioactive). This raises the question of whether there was any significant dose from the tritium (or other non-gamma emitting radionuclides) that may have been present in those releases. Because no composite analyses were made on clean Neutralizing Sump batch releases, there are no definitive analytical results with which to answer this question.

However, when accounting for the additional activity from the tritium that may have been present in the discharges thought to be clean, the dilution flow which accompanied them must also be included. This additional dilution flow volume would offset any calculated increase in activity due to tritium. The net result is that the overall concentration of all radionuclides, and therefore dose, over the release period would be expected to decrease.

Verification of Chemistry Program compliance with technical specifications requirements is being addressed by Chemistry action item PR 95.9509.03 "Technical Specification to MSTP Review Project", which is in progress.

CORRECTIVE ACTION TAKEN

Corrective action taken upon discovery of elevated tritium in mid-1994 consisted of evaluating the dose effect of elevated tritium levels and issuing corrections to the semi-annual radioactive effluent waste and disposal reports. All subsequent Neutralizing Sumps were considered as radioactive.

PR96.9525 was written on October 4, 1996, to document that the Neutralizing Sump discharges did not always have the composite analyses performed that are required by technical specifications.

CORRECTIVE ACTION PLANNED TO PRECLUDE RECURRENCE

A standing order was issued on October 25, 1996 to re-communicate the practice which has been in existence since September 1994 to require all Neutralizing Sump discharges to be considered radioactive. This interim measure will be incorporated into procedures 7.9.2 and 7.9.5. These procedural changes are a formalization of the standing order and are not required to achieve full compliance.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Full compliance was achieved in September 1994 when all Neutralizing Sump discharges were treated as radioactive and composite analyses were conducted.

SAFETY CONSEQUENCES

The failure to perform the specified analyses on certain Neutralizing Sump discharges for which gamma radiation was not detected in samples taken prior to discharge in the period March 1986 through August 1994 posed no threat to public health and safety.

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Batch analyses were performed prior to Neutralizing Sump discharges, and composite analyses were performed if gamma radiation was detected in Neutralizing Sump samples taken prior to discharge. For those liquid discharges for which the samples taken did not detect gamma radiation during the time of the RFP leak, dose impact was evaluated using the highest tritium concentration for that period. Even though these additional discharges resulted in a slight increase in the amount of tritium released, the additional dilution water volume resulted in lower concentrations of all radionuclides. Since dose is proportional to radionuclide concentration, additional Neutralizing Sump discharges caused a decrease in radiological impact. Similar reductions in dose impact resulting from additional dilution flow during Neutralizing Sump discharges would have occurred during the period of 1986 to 1993.

The Neutralizing Sump discharges are made to the discharge canal. Liquid samples are taken from the discharge canal as part of the environmental monitoring program and are included in the annual environmental reports. No radioactivity attributable to PNPS operations has been detected in discharge canal water samples collected as part of the environmental monitoring program.

Therefore, there were no public health and safety consequences as a result of not performing certain composite analyses from March 1986 to mid-1994.

This report is submitted in accordance with 10 CFR 50.73(a)(2)(i)(B) because certain Neutralizing Sump discharges were made in 1986 to 1994 without performing the specified composite analyses.

SIMILARITY TO SIMILAR EVENTS

A review for similarity was conducted of Pilgrim Station licensee event reports (LERs) submitted since January 1984. The review focused on LERs submitted in accordance with 10 CFR 50.73(a)(2)(i)(B) that involved analysis of a similar cause. The review identified LER 85-020-00.

LER 85-020-00 involved a three day delay in notifying Operations personnel that the test results of samples of emergency diesel generator (EDG) 'A' fuel oil did not meet the acceptance criteria of Technical Specification 4.9.A.1.e. As a result of the notification, EDG 'A' was declared inoperable and the actions specified by Technical Specification 4.5.F.1 for an inoperable EDG were initiated. The cause of the delay was an inadequacy in procedure 7.1.36, "Diesel Generators' Fuel Oil Sampling and Quality Analyses." The procedure was inadequate in that it did not state that the nuclear watch engineer (NWE), i.e., the senior on-shift licensed operator, must be notified if the fuel oil test results were not within specification. Corrective action taken included a revision of procedure 7.1.36. The focus of the revision (to rev. 6) was to immediately notify the NWE if test results of EDG fuel oil do not meet the acceptance criteria.

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ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) CODES

The EIIS codes for this report are as follows:

COMPONENTS

CODES

Reservoir (Neutralizing Sump)

RVR

Sink (Neutralizing Sump)

SNK

Tank (Neutralizing Sump)

TK

SYSTEMS

CODES

Liquid waste management system

WD