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 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 89-017-00: on 890811, transfers of contaminated resins to onsite CTP result in Tech Spec violations.

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DUKE POWER

December 18, 1989

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287
LER 269/89-17

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report (LER) 269/89-17 concerning transfers of contaminated resins to onsite chemical treatment pond resulting in Technical Specification violations due to inappropriate action and failure to follow procedure.

This report is being submitted in accordance with 10 CFR 50.73 (a)(2)(i)(b). This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

M. S. Tuckman
Station Manager

/ftr

Attachment

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Oconee Nuclear Station, Unit 1										DOCKET NUMBER (2) 0 5 0 0 0 2 6 9 1				PAGE (3) 1 OF 0 8		
TITLE (4) Transfers of Contaminated Resins to Onsite Chemical Treatment Pond Result in Tech. Spec. Violations Due to Inappropriate Action, Failure to Follow Procedure																
EVENT DATE (6)			LER NUMBER (8)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)						
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES				DOCKET NUMBER(S)			
0 8	1 1	8 9	8 9	0 1 7	0 0	1 2	1 8	8 9					0 5 0 0 0			
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)														
N		20.402(b)				20.408(a)				80.73(a)(2)(iv)				73.71(b)		
POWER LEVEL (10)		20.408(a)(1)(i)				80.38(a)(1)				80.73(a)(2)(vi)				73.71(a)		
1 0 0		20.408(a)(1)(ii)				80.38(a)(2)				80.73(a)(2)(vii)				OTHER (Specify in Abstract below and in Text, NRC Form 308A)		
		20.408(a)(1)(iii)				80.73(a)(2)(ii)				80.73(a)(2)(viii)(A)						
		20.408(a)(1)(iv)				80.73(a)(2)(iii)				80.73(a)(2)(viii)(B)						
		20.408(a)(1)(v)				80.73(a)(2)(iii)				80.73(a)(2)(ix)						
LICENSEE CONTACT FOR THIS LER (12)																
NAME										TELEPHONE NUMBER						
										AREA CODE						
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC						
SUPPLEMENTAL REPORT EXPECTED (14)												EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)												X NO				

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

ABSTRACT

On August 11, 1989, at 1330 hours, a batch transfer of Polishing Demineralizer (Powdex) resins, performed in violation of procedure requirements, resulted in the violation of Technical Specification (TS) 3.9.4.b. The transfer of Powdex resins to the Chemical Treatment Pond (CTP) was prohibited by TS due to the high activity level of the preceding resin batch transfer. Oconee Unit 1 was undergoing a start-up following a Reactor trip on August 10. On August 21, 1989, at 1045 hours, with Unit 1 at 100% Full Power, Powdex resins were again transferred to CTP 1 in violation of the procedure and TS 3.9.4.b. In addition, due to isotope activity levels in the batch, the total 13-week transfer activity limit of TS 3.9.4.c was also violated as a result of this transfer. On November 17, 1989, these events were discovered by a station Chemistry Section Engineer while attempting to de-bug the computer program which compiles and prints reports of Powdex transfers and activity levels. The Root Cause of these events is Inappropriate Action, failure to follow procedure. Chemistry section management took immediate action and prohibited further transfers of Powdex resin to the CTP. This report shall serve to satisfy the reporting requirements of TS 3.9.4.c and 6.6.3.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED ONS NO 3150-0104
EXPIRES 8/31/95

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Oconee Nuclear Station, Unit 1	0 5 0 0 0 2 6 9	8 9	- 0 1 7	- 0 0	0 2	OF	0 8

TEXT (If more space is required, use additional NRC Form 388A's) (17)

BACKGROUND

To help control secondary system chemistry, Condensate System [EIIS:SD] water is cleaned in Polishing Demineralizer [EIIS:SF] (Powdex) cells. There are five cells per Unit. Powdered resin is used to pre-coat the elements in each cell. Condensate System water is cleaned as impurities are removed by the resins.

As the resin bed performs its function of removing impurities the resins become expended. When the cell is expended it is taken out of service, the expended resins are backwashed to a powdex backwash sump, and the elements are pre-coated with a new resin bed prior to placing the cell back in operation.

During operation of the powdex cells the resins can become contaminated, due to primary-to-secondary leaks, and the contents of the backwash sumps are therefore treated as radioactive waste. Backwash sump pumps are used to transfer the sump contents to either the Chemical Treatment Ponds (CTP) or the Radwaste Facility [EIIS:NE] Backwash Receiving Tank.

There are three onsite CTPs. Resins can be pumped to either CTP 1 or 2. A sample of the expended resins is taken as the contents of the sump are being transferred to the CTPs, and therefore, the actual isotope activity levels are not known prior to transfer of the resin. Resins settle to the bottom and controlled releases allow water decanted from CTP 1 and 2 to drain to CTP 3. Technical Specification 3.9.4 establishes radionuclide inventory limits for the CTPs as well as for individual batch transfers to implement various Code of Federal Regulation requirements regarding the handling of radioactive effluents, and also specifies reporting requirements for instances when pond or batch transfer activity limits are exceeded. The total activity limit for all transfers made during a 'running' 13 week period is intended to ensure that total pond lifetime activity limits are not exceeded before the end of the expected 40 year life of the station.

EVENT DESCRIPTION

Prior to April 1989, Station Sciences General-Supervisor 'A' (GS-A) had routinely performed periodic reviews of reports generated by the Chemical Treatment Pond Isotope Inventory Program (CTP-IIP). Reports generated by this program were the 'Weekly Powdex Backwash Summary', 'CTP Radionuclide Inventory', and '13-week Activity' reports.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Oconee Nuclear Station, Unit 1	05000269	89	-017	-00	03	OF	08

TEXT (If more space is required, use additional NRC Form 368A's) (17)

During April of 1989, the position of Station Sciences-General Supervisor was in the process of turnover. During this time CTP-IIP was not working and Powdex cells were being backwashed to the Radwaste Facility and not to the CTP.

On the morning of August 11, 1989, startup of Unit 1 was in progress following a Reactor trip the previous day. At 1030 hours, a batch of resins (Batch-A) from Powdex cell 1 'E' was backwashed to CTP 1. The transfer was performed by Nuclear Chemistry Specialists (NCS) 'A' and 'B'. Procedure CP/O/B/3002/16, 'Polishing Demineralizer Operating Procedure', was used, and, as required by procedure, a sample of resins was taken for analysis as Batch-A was being transferred.

At approximately 1330 hours on August 11, 1989, NCS-A and NCS-B were preparing to backwash Powdex cell 1'D' (Batch-B) to CTP 1. Step 2.14.1 of procedure CP/O/B/3002/16 states, in part, "... no batch of used Powdex resin shall be transferred to the CTP unless the sum of the ratios of the activity ... in the preceding batch ... is less than 0.1% of the CTP inventory limit." The 13-Week activity inventory limit, for all transfers in a given 13 week period, is 0.4% of the CTP inventory limit. Step 2.14.1 implements the requirements of Technical Specification (TS) 3.9.4.b.

At 1330 hours, Batch-B was backwashed to CTP 1 even though the sample of the preceding batch had not yet been analyzed; this violated both procedure and TS requirements. The results of the analysis for the sample taken from Batch-A were not available until 1545 hours.

The results of the analysis (the 'gamma-spectra' report) performed on the sample of Batch-A indicated that the sum of the ratios of activity were 2.5 times the limit of 1.0×10^{-3} microcuries per milliliter (uCi/ml). The results of the analysis of the sample taken from Batch-B indicated that this cell was also $> 1.0 \times 10^{-3}$ uCi/ml and had high isotope activity levels.

NCS-A and NCS-B completed Enclosure 7.4 (activity worksheet) of procedure CP/O/B/3002/16 for each cell backwashed using results of the gamma-spectra analysis and gave the completed worksheets and attached gamma-spectra reports to Chemistry Section Clerk 'A' (CC-A). CC-A inputs information from these documents into the CTP-IIP program and this program compiles the information into the Weekly Summary, CTP Activity Inventory and 13-week inventory printouts.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMS NO. 3150-0104
EXPIRES 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Oconee Nuclear Station, Unit 1	0 5 0 0 0 2 6 9	8 9	- 0 1 7	- 0 0	0 4	OF	0 8

TEXT (If more space is required, use additional NRC Form 306A's) (17)

On August 21, 1989, at 1045 hours, NCS-B and NCS-C backwashed Powdex cell 1'C' (Batch-C) to CTP 1. The analysis of the sample taken during the transfer indicated that the sum of the ratios for the batch activity was five times the limit and the quantity of activity for Iodine-131 (I-131) was 244 microcuries (uCi). The 13 week limit of TS 3.9.4.c, for total I-131 activity transferred in a 13 week period, is 204 uCi. In addition, TS 3.9.4.b was again violated since the sum of the ratios of the preceding batch (Batch-B) had been $> 1.0 \times 10E-3$ uCi/ml. NCS-C and NCS-B completed the activity worksheet and sent it and the attached gamma-spec to CC-A. Data was entered into CTP-IIP. No reviews of the activity worksheets or gamma-spectras for Batch 'A', 'B', or 'C' were performed prior to entry into the CTP-IIP program.

In November of 1989, CC-A noted that some data on reports generated by CTP-IIP were being printed out in the wrong fields. CC-A identified the errors to Chemistry Section Engineer 'A' (CSE-A). CSE-A determined that the error in the program dated back to July 5, 1989 and subsequently had a corrected Transfer Summary printout made for the period from July 5th through November 16th. During his review of this Transfer Summary printout, on November 17, 1989, CSE-A noted that the Powdex cell transfer made to CTP 1 on August 21 appeared to exceed the 13-Week transfer limits of TS 3.9.4.c.

CSE-A notified Chemistry Section management of the apparent TS violations. At approximately 1500 hours CSE-A manually calculated pond activity inventory limits to verify the Transfer Summary report results. In addition, the activity worksheets and gamma-spectra reports for Powdex cell transfers from July 5th to November 16th were reviewed. During the review, the August 11th violation of TS 3.9.4.b, due to the transfer of Batch-B, was identified.

Immediate corrective action taken by Chemistry Section management was to prohibit the transfer of Powdex cells to the CTPs. Subsequent corrective action was to review records of Powdex cell to CTP transfers back to January 1, 1989. This review identified the following additional violations;

On August 22 and 27, 1989, Powdex cells were backwashed to CTP 1. Since CTP activity limits of TS 3.9.4.c were already exceeded, due to Batch 'B' and 'C', these transfers were also in violation of the procedure requirements which prohibit backwashing of cells to the CTP under these conditions. The transfer on August 22 was also a violation of TS 3.9.4.b.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (6)

PAGE (3)

YEAR

SEQUENTIAL
NUMBERREVISION
NUMBER

Oconee Nuclear Station, Unit 1

0 5 0 0 0 2 6 9 8 9 - 0 1 7 - 0 0 0 5 OF 0 8

TEXT (If more space is required, use additional NRC Form 306A's) (17)

CONCLUSIONS

The violations of Technical Specification (TS) 3.9.4.b, identified in this report, are due to Inappropriate Action, failure to follow procedure by Nuclear Chemistry Specialists. The procedure and activity worksheets are clear in the TS requirements and limits, for release of Polishing Demineralizer (Powdex) cells to the Chemical Treatment Pond (CTP). In violation of these requirements, the NCSs did not obtain or review the results of the analysis of the preceding sample prior to the transfer of subsequent batches. In addition, Chemistry Management was not informed of the violation even after the NCSs had received the analysis results and completed the activity worksheets. NCS-C did inform the Secondary Chemistry Supervisor (SCS), who had been on vacation, that a 'hot' cell had been transferred to the CTP on August 21, but the SCS did not realize that the August 21 transfer had been preceded by other 'hot' cells. This is attributed to poor communication between NCS-C and SCS.

A review of the completed documentation revealed that no independent reviews of completed activity worksheets and gamma-spectra reports were performed prior to input of the data into the CTP-IIP by Chemistry Section Clerk 'A' (CC-A). This is a violation of Procedure Completion Review requirements of the Administrative Policy Manual and Station Directive.

Procedure CP/O/B/3002/16 step 7.11.1 requires that the NCS ensure CTP activity inventory limits are low enough to allow the transfer of additional activity. However, due to the errors in the CTP-IIP it is possible that had the CTP Activity Inventory report been reviewed it would not have indicated that 13-Week inventory limits had been exceeded. Some of the data was printed out in the wrong field and some isotope activity levels were indicated as being as much as 100 times lower than actual activity. It should also be noted that, due to the fact that Powdex cells are transferred without first sampling and analyzing the resin activities, it is possible for a single cell transfer to violate the 13-Week transfer activity limit of TS 3.9.4.c. The NCSs who were responsible for transferring the cells to the CTP were familiar with the procedure requirements. However, no cells had gone to the CTP since February 1989. In addition, normally, 'hot' cells are the result of a primary to secondary leak. Unit 1 was not experiencing a leak during this time, however NCS 'A' and 'B' failed to consider that cells are also often highly contaminated following a plant transient, and resulting crud burst, such as Unit 1 had on August 10. Also, the procedure stresses the importance of getting cells back in service. It is concluded that poor judgement on the part of NCS 'A' and 'B' led to their failure to follow procedure. Subsequent transfers were done relying on information from the CTP-IIP, which was in error.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (8)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Oconee Nuclear Station, Unit 1	0500026989	-01	7	-010	06	OF	08

TEXT (If more space is required, use additional NRC Form 286A's) (17)

It is also concluded that inadequate programs existed to allow the timely identification and reporting of TS CTP and 13-Week transfer activity limit violations. The poor communication between SCS and NCS-C was a contributing factor in the delay, however, procedure reviews performed and programs in place were generally inadequate to allow the timely identification and reporting of TS violations.

It is further concluded that there was a less than adequate turnover between General Supervisor (GS) A and GS-B. While GS-A had routinely performed reviews of CTP-IIP printouts which might have allowed timely identification of events in this report, these review responsibilities were not adequately communicated to GS-B during the turnover process. This was due, in part, to the facts that no Powdex cells were backwashed and CTP-IIP reports were not generated during the turnover period. Again, it should be noted that it is by no means sure that, if GS-B had performed routine reviews of CTP-IIP, these reviews would have detected the violations, since the printouts during this time mislocated information and also gave erroneous activity levels.

The subsequent and planned corrective actions appear to be adequate to prevent recurrence; appropriate personnel received disciplinary action; Powdex transfers will no longer be permitted to go directly to the CTP and supervisory approval will be required prior to allowing transfers to the CTP from other sources. In addition, sampling prior to transfer from these other sources is possible. To help ensure the timely identification of violations of CTP activity limits, procedure and CTP-IIP review requirements will be enhanced.

The events in this report are recurring. LER 269/89-07 documents an inadvertent transfer of a Powdex cell to the CTP as a result of, in part, Inappropriate Action, failure to follow procedure. In this instance, the failure to follow procedure resulted in an incorrect valve line-up. The corrective actions resulting from the previous LER would not be expected to prevent the events in this report.

There were no equipment failures involved, and therefore, this report is not NPRDS reportable.

CORRECTIVE ACTIONSIMMEDIATE

1. Chemistry Section Management prohibited further backwashes of Polishing Demineralizer (Powdex) resins to the Chemical Treatment Pond (CTP).

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES 8/31/86

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Oconee Nuclear Station, Unit 1	05000269	89	-017	-00	07	OF	08

TEXT: If more space is required, use additional NRC Form 366A's (117)

SUBSEQUENT

1. Reviewed records of all Powdex cell to CTP transfers made during 1989.
2. Appropriate personnel received disciplinary action.
3. CP/O/B/5200/42, "Resin Recovery System Operation" has been revised to prohibit the transfer of Powdex cell resins directly to the CTP. All future cells will be backwashed to the Backwash Receiving Tank in the Radwaste Facility (RWF). All future transfers to the CTP will be from sources which can be sampled and analyzed prior to sending. In addition, all transfers from the RWF will require a supervisor's approval prior to resin transfer. The supervisor's approval will constitute an additional review of transfer activity levels and should help ensure that CTP 13-Week activity limits are not exceeded.

PLANNED

1. Chemistry Section Management will review this report with their Supervisors noting the deficiencies identified by this report.
2. CP/O/B/3002/16, "Polishing Demineralizer Operating Procedure" will be revised as necessary, to reflect the changes made to Procedure CP/O/B/5200/42.

SAFETY ANALYSIS

The inventory limits of the Chemical Treatment Ponds are based on limiting the consequences of an uncontrolled off-site release from the CTPs. Batch limits are intended to provide assurance that activity input to the CTP will be minimized.

The 13-week activity limit for all batches of resin transferred during a running quarterly period is 0.4% of the total pond inventory limit. As a result, even though the 13-week transfer limit was exceeded, the CTP total activity limit was not exceeded.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (3)

PAGE (3)

Oconee Nuclear Station, Unit 1

0 5 0 0 0 2 6 9 8 9 - 0 1 7 - 0 0 0 8 OF 0 8

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

A release from CTP 1 was made on August 29, 1989 however, as indicated, CTP activity was below limits at the time. In addition, CP/O/B/4002/6, "Operation of the Conventional Waste System" was used and controlled the release of CTP inventory to the environment. This procedure requires the sampling of the CTP prior to release. The sample results must indicate that maximum permissible concentration limits are not exceeded before releases are allowed.

There were no radiological releases to the environment or personnel injuries as a result of these events and the health and safety of the public was not affected.