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DUKE POWER

January 12, 1990

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Washington, D. C. 20555

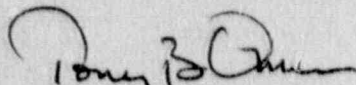
Subject: Catawba Nuclear Station
Docket No. 50-413
LER 413/89-30

Gentlemen:

Attached is Licensee Event Report 413/89-30, concerning TECHNICAL SPECIFICATION VIOLATION DUE TO SHIPMENT OF TWO LINES OF SECONDARY BEAD AND POWDEX RESIN MIXTURE IN VIOLATION OF THE PROCESS CONTROL PROGRAM.

This event was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,


Tony B. Owen
Station Manager

keb\LER-NRC.TBO

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Catawba Nuclear Station, Unit 1										DOCKET NUMBER (2) 0 5 0 0 0 4 1 3										PAGE (3) 1 OF 07	
TITLE (4) Technical Specification Violation Due to Shipment of Two Liners of Secondary Bead And Powdex Resin Mixture In Violation Of The Process Control Program																					
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 NAMES CNS, Unit 2						DOCKET NUMBER(S) 0 5 0 0 0 4 1 4						
07	26	89	89	013		00	01	12	89							0 5 0 0 0 1 1					
OPERATING MODE (9) 1		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)																			
POWER LEVEL (10) 110.0		20.402(b)				20.406(c)				50.73(a)(2)(iv)				73.71(h)							
		20.406(a)(1)(i)				50.36(a)(1)				50.73(a)(2)(v)				73.71(c)							
		20.406(a)(1)(ii)				50.36(a)(2)				50.73(a)(2)(vi)				OTHER (Specify in Abstract below and in Text, NRC Form 366A)							
		20.406(a)(1)(iii)				X 50.73(a)(2)(ii)				50.73(a)(2)(viii)(A)											
		20.406(a)(1)(iv)				50.73(a)(2)(iii)				50.73(a)(2)(viii)(B)											
		20.406(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(ix)											
LICENSEE CONTACT FOR THIS LER (12)																					
NAME R.M. Glover, Compliance Manager										TELEPHONE NUMBER 8 0 3 8 3 1 1 - 1 3 2 1 3 6											
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					
X YES (If yes, complete EXPECTED SUBMISSION DATE)												NO		04	15	90					

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

On July 26, 1989, with Units 1 and 2 in Mode 1, Power Operation, two carbon steel liners containing a mixture of powdex and bead resins were shipped to the Low Level Waste Repository in Barnwell, S.C. Verbal Vendor approval of this shipment had been obtained. On December 7, 1989, Duke Power Company (DPC) Nuclear Chemistry issued a letter to CNSI Engineering discussing the possibility of mixing of bead and powdex resins. This letter was copied to the CNS Chemistry Scientist who realized that these types of resin loadings had previously been shipped from CNS. CNSI Operations, Engineering and DPC Nuclear Chemistry were contacted. On December 15, 1989, it was determined that a Technical Specification violation had occurred due to the shipment of two mixed media resin liners in violation of the Process Control Program. Further shipments of mixed media secondary resin at CNS have been suspended until proper testing on dewatering effectiveness of mixed media resins has been determined. This incident is attributed to a Management Deficiency.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

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TEXT (If more space is required, use additional NRC Form 376A's) (17)

BACKGROUND

The Condensate [EIIS:SD] (CM) System takes Condensate from the Main Turbine Condenser Hotwell and purifies it to meet water chemistry specifications in the Condensate Polisher Demineralizers [EIIS:KD] (CPD) and after reheating delivers the Condensate to the Main Feedwater [EIIS:SJ] (CF) System for delivery to the Steam Generators [EIIS:HX] (S/Gs). The CPD's are used to remove ionic and particulate contaminants from the condensate to minimize corrosion products which could affect Unit performance. The CPD's utilize a powdered resin form and a precoat filter media. When a CPD cell reaches the end of its life the spent powder resins and filter aids are backwashed and drained to the CPD Backwash Tank. The spent resins are sampled and isotopically analyzed prior to discharge to insure the limits imposed by the State of S.C. and the NRC are not exceeded. This spent resin is not normally contaminated and is discharged via the Conventional Waste [EIIS:WH] (WC) System. If the limits are exceeded the spent resin is transferred to carbon steel liners for burial as Class A unstable waste at the Barnwell Low Level Waste Repository.

The S/G Blowdown [EIIS:WI] (BB) System assists in maintaining proper S/G shell side water chemistry by removing non volatile materials that would otherwise concentrate in the shell side of the S/G's. This is accomplished by bleeding saturated condensate from locations near the bottom of the S/G's to the BB tank. The BB tank receives the saturated bleed from the S/G's where part of the saturated condensate expands to steam and is delivered to the CF heaters for heat recovery. The remaining BB condensate normally flows through the BB Heat Exchangers, Prefilters and demineralizers to the Condenser Hotwell. The BB demineralizers use a bead type resin to remove ionic and particulate contaminants. The spent resins from the BB demineralizers can be discharged to the WC System if not contaminated or to a liner for burial at a Low Level Waste Repository if contaminated.

The Duke Power Company (DPC) Corporate Process Control Program (PCP) establishes "a set of requirements that shall be met at all Nuclear Stations to insure all solidification and dewatering activities are conducted in a manner and produce a final product that complies with all applicable Federal and State regulations and licensed burial site criteria". Station specific procedures have been developed to implement the requirements of the PCP. The station specific procedures incorporate the Chem-Nuclear Systems Incorporated (CNSI) procedures for dewatering carbon steel liners. CNSI is contracted by DPC to provide dewatering services and provide the liners used for burial at the Low Level Waste Repository in Barnwell, S.C. The liners are equipped with dewatering laterals designed for dewatering specific resin forms. The powdex resin liners are equipped with three to four drain laterals located at different elevations in the liner, whereas the bead resin liners are equipped with one dewatering lateral located at the bottom of the liner. CNSI also provides specific procedures for fill and dewatering of powdex and bead resin which are Enclosures

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4.5 and 4.6, respectively, of Chemistry Procedure OP/O/B/6500/09, Operating Procedure For The Control And Use Of Vendor Procedure. OP/O/B/6500/53, Operating Procedure For Transfer And Dewatering Of Secondary Resins is used to document the resin transfer and boundary conditions for liner dewatering. This procedure states that physical testing shall be performed if the PCP is not followed. The PCP states that boundary conditions will be established for all process parameters. The process parameters include waste form, settling time, drain (or pump) time and drying time. Waste form is not specifically addressed in OP/O/B/6500/53.

Technical Specification 3/4.11.3 states that radioactive waste shall be solidified or dewatered in accordance with the PCP to meet shipping and transportation requirements during transit, and disposal site requirements when received at the disposal site. This Technical Specification is applicable at all times and requires the following actions:

- With Solidification or dewatering not meeting the disposal site and shipping and transportation requirements, suspend shipment of the inadequately processed wastes and correct the PCP, the procedures and/or the Solid Radwaste System [EIS:WB] as necessary to prevent recurrence.
- With the Solidification or dewatering not performed in accordance with the PCP, test the improperly processed waste to insure that it meets burial ground and shipping requirements and take appropriate administrative action to prevent recurrence.
- The provisions of Technical Specification 3.0.3 are not applicable.

EVENT DESCRIPTION

In March 1989, the question of feasibility of loading of bead resin into powdex liners, at CNS, was first raised, after the Secondary Chemistry Supervisor noted that the amount of bead resin transferred into a bead resin liner from the CPD Backwash tank was less than the amount transferred from the BB demineralizers to the CPD Backwash tank. Further investigation by the Chemistry Supervisor found that bead resin would tend to settle in the bottom of the horizontal CPD Backwash tank during sluicing operations. This discovery led the Chemistry Supervisor to investigate handling of the possibly mixed media resins in the bottom of the CPD Backwash tank. The CNSI Site Operator was contacted with the question of the possibility of mixing bead and powdex resin in the same liner. The CNSI Site Operator contacted a CNSI Operations Supervisor in the Columbia, S.C. headquarters who indicated on March 7, 1989, that bead and powdex resin could be mixed in powdex liners and dewatered using the powdex dewatering procedure. A follow-up telephone conference with the CNS Radiation Protection (RP) Associate Scientist and the CNSI Barnwell Manager of Regulatory Affairs was made concerning the

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proper waste description to be used on the shipping manifest containing the mixed bead and powdex resin. The CNSI Regulatory Affairs Manager stated that such shipments should be labeled "dewatered filter media" on the waste descriptions when completing the radioactive shipment manifest. This conversation was also documented in a Memorandum To File by the RP Associate Scientist on March 9, 1989.

On March 22, 1989, a meeting between Station Chemistry and RP personnel was held to discuss secondary bead resin handling problems. Topics included mixing bead and powdex resins in the same liner, and bead resin sampling problems caused by residual resin in the CPD Backwash tank. The RP Associate Scientist explained that RP did not have a problem with mixing bead and powdex resin from a sampling standpoint, since the densities and waste streams were virtually the same. Also, a plan for preventing residual bead resins in the CPD Backwash tank from contaminating clean resin in the CPD Backwash tank was addressed. This meeting was documented in a Memorandum To File by the Chemistry Scientist on April 3, 1989 and copied to Station Chemistry management. The Corporate Nuclear Chemistry personnel were not involved in this meeting.

On April 21, 1989, 33 cubic feet (cf) of bead resin were added to liner serial number 451804-01. On May 2, 67 cf of powdex resin and 85 cf of bead resin were mixed in the backwash tank and transferred to liner 451804-01 and the liner was subsequently dewatered using the powdex dewatering procedure. On June 7, 18 cf of bead resin were added to the top of liner serial number 448885-28 which had previously been loaded with 88 cf and 79 cf of powdex on October 12, 1988 and February 10, 1989, respectively. Liner serial number 448885-28 was subsequently dewatered per the powdex dewatering procedure.

On July 19, 1989, CNSI Barnwell Regulatory Affairs personnel advised the RP Associate Scientist to use the description "dewatered powdex and bead resin" for the mixed media resin liner shipping manifest instead of using "dewatered filter media" as previously stated during the March 7 conversation. On July 26, 1989, the two mixed media resin liners were shipped to the Low Level Waste Repository in Barnwell, S.C.

In December of 1989, McGuire Nuclear Station (MNS) contacted Corporate Nuclear Chemistry and requested permission to dewater bead and powdex resin at MNS. On December 7, 1989, a letter from the DPC Corporate Nuclear Chemistry was sent to CNSI Engineering referring to previous telephone conversations, between Corporate Nuclear Chemistry and CNSI, concerning the possibility of loading powdex and bead resins in the same powdex liner. This letter was initiated after MNS Chemistry had notified Corporate Nuclear Chemistry that they were not able to completely fill bead resins liners due to the amount of water required to sluice bead resin. Shipments of mixed resin could eliminate this problem and better utilize storage space. The letter stated that DPC was interested in pursuing this for disposal of secondary powdex and bead resin and referred to testing required to determine if mixed loadings are feasible. This letter was

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also copied to the Chemistry Scientist at Catawba Nuclear Station (CNS). Upon receipt of this letter the Chemistry Scientist noted that two powdex liners consisting of bead and powdex resin had been previously shipped to the waste repository at Barnwell, S.C., on July 26, 1989. On December 12, 1989, the Chemistry Scientist promptly notified the CNSI Site Operator who was also aware of the prior shipment, to determine if there was a problem with the July 26, 1989 shipment. The CNSI Site Operator contacted the CNSI Operations Manager who stated that it was acceptable to dewater mixtures of bead and powdex resin in powdex liners using the powdex dewatering procedure. The issue of mixed resin liners, however continued to be pursued by the Chemistry Scientist and Corporate Nuclear Chemistry was notified of the problem.

On December 15, 1989, at 1630 hours, Problem Investigation Report (PIR) 0-C89-0381 was issued due to a violation of Technical Specification 3/4.11.3. This was due to two liners of mixed media (powdex and bead resin) being shipped in violation of the PCP. Since the boundary conditions for resin form were not met, a Technical Specification violation occurred. The conclusion, that Technical Specification 3/4.11.3 had been violated, was drawn following a telephone conference between Corporate Nuclear Chemistry, Station Chemistry and CNSI Operations and Engineering Departments.

Further shipments of mixed secondary resin liners have been suspended until testing of mixed media liners has been performed and the required procedure changes have been issued. Resin loading similar to the least conservative liner shipped, on July 26, are being tested to insure adequate dewatering.

CONCLUSIONS

Technical Specification 3/4.11.3 was violated due to two liners of bead and powdex resin mixtures being shipped to the Barnwell Low Level Waste Repository, after being dewatered using an inadequate procedure for the type of resin form. The CNSI procedure used (FO-OP-22, Ecodex-Precoat/Powdex/Solka-Floc/Diatomaceous Earth Dewatering Procedure For CNSI 14-215 or Smaller Liners), Enclosure 4.5 of OP/O/B/6500/09, specifies that "this procedure applies only to the dewatering of Ecodex-Precoat/Powdex/Solka-Floc/Diatomaceous Earth or equivalent base forms in CNSI 14-215 or smaller liners with less than 1% oil". The dewatering procedure used was inadequate for the liner loading since it did not include bead resin in the applicability statement. The CNS Chemistry personnel, however, interpreted the "or equivalent base forms" to include bead resin, since the bead resin and powdex resin are of the same chemical composition. Also the CNSI Operations and Barnwell Regulatory Affairs Personnel had indicated that bead and powdex resin mixtures could be dewatered in powdex liners using the FO-OP-22 procedure.

This incident is assigned a root cause of Management Deficiency, due to inadequate policy or directive, in that the PCP allowed a deviation from the normal practice of handling bead and powdex resin separately to be changed

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without the involvement of Corporate Nuclear Chemistry. The involvement of Corporate Nuclear Chemistry would have provided an additional level of review and would have probably led to consultation with CNSI Engineering. Chemistry will be directed to inform Corporate Nuclear Chemistry when any changes to the handling of radioactive waste are anticipated or required.

This incident is assigned a contributing cause of management deficiency, due to poor management interface, in that the CNSI Operations group, Barnwell Site Regulatory Affairs and the CNSI Engineering group had conflicting interpretations as to the applicability of Procedure FO-OP-22 to handle mixtures of bead and powdex resin. The discussions between station personnel and the CNSI Operations and Barnwell Regulatory Affairs personnel led to the misinterpretation of the procedure applicability.

This Technical Specification violation is also assigned a contributing cause of a possible procedure deficiency, in that the statement "or equivalent base forms" was misinterpreted by the CNSI Operations group, Barnwell Site Regulatory Affairs, and by the CNS Chemistry personnel. Also OP/O/B/6500/53, Enclosure 4.15, Dewatering Record does not specifically list the waste form as a process parameter for which boundary conditions are established. Although the Chemistry Supervisor was aware of the applicability statement in FO-OP-22, listing of the waste form in the boundary conditions may have instigated further review. If the boundary conditions are not met or are in doubt physical testing of the liner can be performed to insure proper dewatering per the PCP. Physical Testing, per OP/O/B/6500/09, consists of visual inspection and a probe penetrate test. OP/O/B/6500/09 will be evaluated to determine if clarification of the applicability statement is warranted. Also, OP/O/B/6500/53 will be evaluated to determine whether all process parameters are adequately addressed.

A review of the Operating Experience Program database for the past 24 months, does not yield any Technical Specification violations due to procedural or management deficiencies. Therefore, this incident is not considered to be a recurring problem or a recurring event.

CORRECTIVE ACTIONS

SUBSEQUENT

- 1) Shipments of mixed bead and powdex resins have been suspended until test loaded liners have been tested and any required procedure changes are issued.
- 2) Resin loadings similar to the least conservative liner shipped, on July 27, 1989, are being tested to insure adequate dewatering.

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PLANNED

- 1) The PCP and/or station procedures concerning radioactive waste shipments will be revised to require notification of Nuclear Chemistry when any changes or deviations in the solidification or dewatering of radioactive waste is anticipated or required and may affect the PCP.
- 2) A clearer term for equivalent base forms in the applicability statement for OP/O/B/6500/09, Enclosure 4.5 (FO-OP-22) will be evaluated and included in the procedure applicability statement.
- 3) OP/O/B/6500/53, Operating Procedure For Transfer And Dewatering Contaminated Secondary Resins, will be evaluated to determine whether all process parameters are adequately addressed.
- 4) Chemistry personnel will be made aware of this incident through the Significant Event Notification Training.
- 5) The Safety Evaluation for this LER will be re-evaluated pending the results of the dewatering tests of the test liner at Barnwell.

SAFETY EVALUATION

The two mixed resin liners (serial numbers 44885-28 and 451804-01) shipped, on July 26, 1989, have been buried at the Barnwell Low Level Waste Repository. These liners were dewatered using a procedure that was untested for the mixed resin loading, however, the top of the resin beds were visually inspected and the liners were sounded by the CNSI Site Operator prior to shipment. The visual inspection and sounding did not indicate the presence of freestanding liquid in either liner. Furthermore, visual inspection and probe penetrate testing performed on liner serial number 455979-03, which is being stored at CNS pending the Barnwell test results, was not found to contain free standing liquid. Test loadings must be completed on the test liner at Barnwell before the adequacy of the powdex dewatering procedure on the mixed resin liners can be proved. This Safety Analysis will be revised pending the results of the testing currently being performed at Barnwell.