

UNC NUCLEAR INDUSTRIES



A **UNC RESOURCES** Company

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Memorandum

To: G. L. Smith Date: October 28, 1986

From: *AP Larrick*
A. P. Larrick

Subject: PLANT EVENT REPORT D/T 86-01 CLOSEOUT

Corrective actions as designated in the subject PER have been completed and the closeout line on the PER can be signed off by you. Corrective actions taken are as follows:

1. We have decided to use the epoxy as little as possible to evaporate the laboratory and pilot plant wastes. Instead, we are installing a spare K Basin ion exchange column and will process the waste from the storage tank through the column. This should take out essentially all the salts, ions, and chemicals from the waste water and convert them to a solid, immobile form on the ion exchange resin suitable for burial. The purified water will be analyzed for impurities to see if it can be directly released. If it cannot be released, it will be placed in the epoxy evaporation drum, without epoxy, and evaporated to residual solids.

On the rare circumstance that the epoxy must be used, we will provide continuous attendance during operation to monitor epoxy temperature and shut the system down and/or add extra water for cooling. We will also limit the number of reheats on the epoxy to as low as practicable as we feel only aged, reheated epoxy gives us problems.

2. The material data sheets were reviewed, and one component of the epoxy formulation was stated to exhibit exothermic reactions with a variety of other chemicals. We tried to simulate an exothermic excursion in the laboratory using small quantities of waste from our waste collection tank and epoxy from the solidification system. We were unable to achieve an exothermic reaction when operated at normal conditions. However, when we increased the epoxy temperature to above 500°F, we were able to make dense white fumes come out of the laboratory test glassware and it continued to react even without external heating. The fumes resembled those observed in the solidification system when it overheated.

APL:cab

cc: KC Oberg
APL:File/LB

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PLANT EVENT REPORT DISTRIBUTION

TITLE: "EPOXY OVERHEAT IN 1706-KER 100K"

REPORT REVIEWED BY: S.W. Heaberlin REVIEW DATE: 9-25-86

PLANT REPORT No.: D/T 86-01

REPORT REVIEW FROM OUTSIDE SECTION NEEDED: Yes [] No [X]

IS FURTHER ACTION REQUIRED: Yes [X] No []

CORRECTIVE ACTION ASSIGNMENT

Action assigned to C|WTT, Technology, Development|Technology by 10-30-86

REPORT DISTRIBUTION

Table listing report distribution to various departments and individuals, including HAC, MAP, CAJ/BBW, OPERATIONS PLANNING & CONTROL, 105/109 OPERATIONS, AUXILIARY OPERATIONS, and others.

FINAL DISPOSITION: [] Referred To: _____ Date: _____

[] Recommendation Received: Satisfactory [] Unsatisfactory []

If Unsatisfactory What Is The Final Disposition Of The PER? _____

[] Corrective Action Taken. _____

[] Verified Complete By: _____ Date: _____



PLANT EVENT REPORT

D/T 86-01

TO: MANAGER, N-PLANT OPERATIONS AND/OR N-PLANT MAINTENANCE
DIRECTOR, REACTOR PLANT DEPARTMENT AND/OR REACTOR MAINTENANCE DEPARTMENT.

FROM: A. P. Larrick TIME OF EVENT: 12:35 p.m.

JOB TITLE: Manager, C&WTT DATE OF EVENT: 08-18-86

WORK AREA: 1706-KER 100K SHIFT: A B C D E

N-PLANT STATUS AT TIME OF INCIDENT:
Shutdown Startup Operating Power Level: NA

1. DESCRIPTION OF INCIDENT

Waste solutions were being added to 12 gallons of epoxy in a 30 gallon vessel in a purchased waste solidification system. The epoxy was being heated with external heaters to evaporate the waste solution to residual salts prior to solidifying the epoxy. After about a hour of operation the operator left for lunch. At about the time of returning, the fire alarm sounded and thick white vapors were observed coming from the room containing the heated epoxy resin. Some resin was ejected through an observation port onto the ceiling and adjoining wall. There was no property damage and no fire. The waste was slightly radioactively contaminated and there was no release of contamination outside the radiation zone. During the system heatup and the first hour of systme operation all functions were operating normally and smoothly. During previous operating periods all functions also performed normally.

2. WITNESSES

K. C. Oberg

3. APPARENT REASON FOR, OR CAUSE OF INCIDENT

The epoxy overheated causing emission of the thick, white vapors. The resin ejection was probably due to formation of a steam pocket within the epoxy from evaporation of the water. The epoxy was being stirred. The cause of the overheating is unknow but could have been due to an exothermic reaction between the epoxy and the salts. the waste was a mixture of laboratory wastes collected and neutralized in a storage tank over many months of time. The external heaters were determined to be operating properly following the incident.

4. CORRECTIVE ACTION TAKEN AND RESULTS

1. Electricity to the waste solidification system was shutoff.
2. The fire department personnel entered the area and determined there was no fire. They did not fill out a fire report.
3. Air samples of the white fumes were taken at two locations and were free of radioactivity.
4. The epoxy expelled from the container was cleaned up.
5. The equipment was checked and was working properly and there was no damage.
6. Checked with manufacturer for advice and if the correct resin had been used. He knew of no reason why the resin behaved as it did and verified that the PNS-01 resin used was that supplied with the system.

5. SUGGESTED PERMANENT CORRECTIVE ACTION

1. Provide continuous attendance during operation to monitor epoxy temperature. If temperature starts to rise above operating point, shut system down and add extra water for cooling. The type of overheating found occurs slowly and sufficient time is available to take corrective action.
2. Check Material Safety Data Sheets to see if any mention of exothermic reactions are possible and any corrective action. Run a laboratory test with actual waste to see if an exothermic reaction can be obtained.

6. REPORTED TO NPO/NPM MANAGER AS A POTENTIAL UNUSUAL OCCURRENCE:

Yes No



PLANT EVENT INVESTIGATION REPORT

PER No.: D/T 86-01

INVESTIGATION RESULTS

The incident involved the overheating of epoxy in a waste solidification vessel at 1706-KER 100K. This caused the area to be filled with thick smoke. The investigation showed the responsible operators took the proper action in shutting off the power and obtaining fire department assistance. The exact cause of the overheating has not been discovered.

2. SIGNIFICANCE OF OFF-NORMAL EVENT

(Discuss frequency of occurrence, similar past events, impact on schedules and operations, maintenance time required for repair, repair costs involved, etc.)

No equipment damage occurred and there was no release of radioactivity outside the radiation zone. The waste involved was only slightly contaminated. The significance of the event was that an unknown and as yet unexplained phenomenon occurred.

3. CORRECTIVE ACTIONS (Include Responsible Organization and Due Dates)

1. Provide continuous attendance during operation to monitor epoxy temperature. If temperature starts to rise above operating point, shut system down and add extra water for cooling. The type of overheating found occurs slowly and sufficient time is available to take corrective action. C and WTT|next operating period
2. Check Material Safety Data Sheets to see if any mention of exothermic reactions are possible and any corrective action. Run a laboratory test with actual waste to see if an exothermic reaction can be obtained. C and WTT|10-30-86

4. DESIGNATION OF APPARENT CAUSE BASED ON RESULTS OF THE INVESTIGATION OF THIS OFF-NORMAL EVENT REPORT.

Design Material Personnel Procedure Other

5. APPROVALS

Originator: *W P Linnick* Date: 9-25-86
 Section Manager: *M J ...* Date: 9/25/86
 Action Approvals: *W P Linnick* Date: 9-25-86
 (Managers)

CORRECTIVE ACTION CLOSEOUT

Actions completed - PER closeout: _____ Date: _____
Section Manager