

Log # TXX-901022 File # 10200 Ref. # 50.73(a)(2)(v)

December 6, 1990

William J. Cahill, Jr. Executive Vice President

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

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION DOCKET NO. 50-445 EVENT OR CONDITION THAT COULD HAVE PREVENTED FULFILLMENT OF THE SAFETY FUNCTION OF STRUCTURES OR SYSTEMS LICENSEE EVENT REPORT 90-039-00

Gentlemen:

Enclosed is Licensee Event Report 90-039-00 for Comanche Peak Steam Electric Station Unit 1, "Inadequate Design Implementation Leading to the Potential for Overpressurizaton of Containment Electrical Penetration Assemblies."

Sincerely,

William J. Cahill, Jr.

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Enclosure

c - Mr. R. D. Martin, Region IV Resident Inspectors, CPSES (3)

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existing project requirements regarding system design and implementation processes. Corrective actions included immediate isolation of the Nitrogen Pressurization System from the EPAs and changes to applicable design documents

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4. DESCRIPTION OF THE REPORTABLE EVENT

A. REPORTABLE EVENT CLASSIFICATION

An event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to control the release of radioactive material.

B. PLANT OPERATING CONDITIONS BEFORE THE EVENT

At 0930 CST on October 30, 1990, Unit 1 was operating at 100 percent in Mode 1, Power Operation.

C. STATUS OF STRUCTURES, SYSTEMS, OR COMPONENTS THAT WERE INOPERABLE AT THE START OF THE EVENT AND THAT CONTRIBUTED TO THE EVENT

There were no inoperable structures, systems or components that contributed to the event.

D. NARRATIVE SUMMARY OF THE EVENT, INCLUDING DATES AND APPROXIMATE TIMES

Containment Electrical Penetration Description

The electrical penetration assemblies (EIIS:(PEN)(BD)) (EPAs) consist of electric conductors, conductor seals, module seals, and aperture seals that provides the passage of the electric conductors through a single aperturc in the nuclear containment structure (EIIS:(NH)), while providing a pressure barrier between the inside and the outside of the containment structure. The electric penetration assembly includes terminal (junction) boxes, terminal blocks, connectors and cable supports, and splices which are designed and furnished as an integral part of the assembly. The original design utilized EPAs provided by Bunker Ramo. After 1985 all Bunker Ramo EPAs were replaced with Conax EPA feedthrough assemblies.

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provide maintenance trending surveillance of EPA seal leakage. Alarms are provided to notify the control room of low header pressure.

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Guidance from the current EPA supplier, Conax, indicates that the Nitrogen Pressurization System is not required during normal or accident conditions (EEQSP-ES-12A-01). The Nitrogen Pressurization system is provided with nitrogen cylinders at greater than 2000 psig full pressure. Two regulators are used to step down the header pressure to 60 psig. There are no relief valves, high pressure alarms, or rupture disks in the system. The entire Nitrogen Pressurization System in Non-Safety Related.

Event Description

A design basis review has determined that the Nitrogen Pressurization System for containment EPAs was designed and operated outside the FSAR design bases (ANSI N18.2 and Regulatory Guide 1.29). Additionally, based on a document review, the system had never been qualified for its intended use. Furthermore, this review identified inconsistencies between Specification ES-100 and Design Basis Document (DBD) EE-062, and that DBD-ME-243, "Plant Gas Supply System," was never issued. Specifically, ES-100 requires that upon completion of leak rate testing, the Nitroger, Pressurization System be isolated from the EPAs. This requirement is not reflected on the system drawing (I1-0080), nor is it captured in DBD-EE-062 regarding Containment Electric Penetration Assemblies. As a result, the Nitrogen Pressurization System was utilized as a continuous pressurization system for the EPAs per Station Operating Procedure with no isolation maintained. On October 30, 1990, potential for overpressurization of the EPAs with the resulting potential for loss of Containment Integrity was documented in accordance with station procedures. Immediate action was taken to isolate the Nitrogen Pressurization System from the EPAs, negating the potential for EPA overpressurization. Further review of this event resulted in a determination of reportability per 10CFR50.72(b)(2)(iii)(C) on November 6, 1990 at 1734 CST. The NRC was subsequently notified at 1935 CST.

E. THE METHOD OF DISCOVERY OF EACH COMPONENT OR SYSTEM FAILURE OR PROCEDURAL ERROR

A design basis review and a walkdown of containment penetrations was conducted (as part of the investigation for LER 90-032) to identify any special provisions or features regarding containment penetrations. Engineering review of the condition concluded that operation of the Nitrogen Pressurization System as a continuous

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		pressurization system could have, under ce overpressurization of one or more EPAs wi Integrity.	ertain conditions, resulted in th the potential for loss of Containment
R.	co	MPONENT OR SYSTEM FAILURES	
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		No failed components contributed to this ev	vent.
	В.	CAUSE OF EACH COMPONENT OR SYS	TEM FAILURE
		No failed components contributed to this ev	vent.
	C.	SYSTEMS OR SECONDARY FUNCTIONS FAILURE OF COMPONENTS WITH MULT	S THAT WERE AFFECTED BY TIPLE FUNCTIONS
		No failed components contributed to this ev	vent.
	D.	FAILED COMPONENT INFORMATION	
		No failed components contributed to this ev	vent.
ш.	AN	ALYSIS OF THE EVENT	
	Α.	SAFETY SYSTEM RESPONSES THAT O	CCURRED
		Not applicable - there were no safety syste	am actuations associated with this event.
	В.	DURATION OF SAFETY SYSTEM TRAIN	INOPERABILITY
		Not applicable - there were no safety syste to or during this condition.	ms which were rendered inoperable due

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C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

Primary containment integrity as discussed in Technical Specification 3/4.6.1, ensures that the release of radioactive materials from the containment atmosphere will be restricted to those leakage paths and associated leak rates assumed in the safety analysis. This restriction, in conjunction with the leakage rate limitation, will limit the exclusion area boundary radiation doses to within the dose guideline values of 10CFR100 during accident conditions.

During this condition the potential for failure of EPAs existed due to overpressurization from the Nitrogen Pressurization System. Failure of one or more EPAs could have resulted in potential leakage paths and associated leak rates in excess of those assumed in the safety analyses. As a result, the potential for exceeding 10CFR100 limits could have existed. Overall safety significance is minor, however, considering that for this to occur, a failure in the Nitrogen Pressurization System (specifically a regulator) must cause a failure of the EPA, and that this failure is not detected prior to a loss of coolant accident with elevated containment pressures.

It is concluded that at no time during operation of the plant in this condition did an actual condition exist that threatened the health or safety of the public.

IV. CAUSE OF THE EVENT

ROOT CAUSE

The root cause of this condition is a failure to conform to existing project requirements with regard to plant system design and implementation processes. Four specific instances of a failure to follow the appropriate design control procedures, which resulted in an inadequately designed Nitrogen Pressurization System for the EPAs, are outlined below:

1) The Architect-Engineer did not design or review the Nitrogen Pressurization System.

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- 2) In the process of converting the field sketches to a vital station drawing in 1985, interdisciplinary review identified design concerns which, if corrected, would have prevented the event. Because of turnovers in engineering responsibilities by TU Electric to the Architect-Engineer and from the A-E to an engineering contractor, the conversion process was not completed and the permanent plant drawings were not issued at that time.
- 3) The preparation of Design Basis Document, DBD-EE-062 was inadequate in that it contained incomplete design bases. ANSI N18.2 requirements were not identified. Additionally, DBD-EE-062 makes reference to another DBD (DBD-ME-243) which was never issued.
- Inadequate and incomplete conversion of field sketch FSI-0080 to a permanent plant drawing (I1-0080).

However, the event is believed to be an isolated occurrence because of the unique combination of field design of the Nitrogen Pressurization System and a safety related electrical system (the EPAs) imposing interface requirements on a process system (the Nitrogen Pressurization System). That is, the sequence of electrical system design followed by design of the supporting process system is the reverse of the traditional design sequence.

V. CORRECTIVE ACTIONS

A. IMMEDIATE

1. Valves were closed to isolate the EPAs from the high pressure nitrogen supply.

B. ACTION TO PREVENT RECURRENCE

- 1. Flow Diagram M1-0243 will be revised to include plant gas subsystems, including the Nitrogen Pressurization System.
- 2. The design of the Nitrogen Pressurization System will be validated. If required, a design modification will be implemented to ensure the system complies with the applicable design requirements.

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- 3. DBD-ME-243 will be written to document the design basis for plant gas systems.
- DBD-EE-062 will be revised to include applicable design bases and interface requirements.
- 5. ES-100 will be revised to clarify erection requirements.
- The need for revision to FSAR Sections 10.4.15, 8.3 and Appendix 17A will be considered.
- 7. I1-0080 will be converted to a flow diagram format (M1-200 series)

C. ACTION ON GENERIC CONCERNS

The following actions will be performed to confirm that the event was an isolated occurence:

- 1. It drawings will be reviewed (by I&C) to determine that information is appropriate for non-vital station drawings or that the proper vital station drawing exists.
- 2. DBD open items will be reviewed for appropriate resolution.
- "System interfaces" Sections of selected systems DBDs will be reviewed to ensure that they are complete and safety related interfaces are properly addressed.
- 4. It drawings will be reviewed to determine that information is appropriate for nonvital station drawings or that the proper vital station drawing exists.

VI. PREVIOUS SIMILAR EVENTS

CPSES Licensee Event Report 90-032-00 documents an event in which design requirements were not adequately identified and addressed in engineering and corrating documentation. As a result of the investigation conducted for LER 90-032-00, the event discussed in this LER was identified.