



**TU**ELECTRIC

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October 9, 1989

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

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)  
DOCKET NOS. 50-445 AND 50-446  
VENTILATION EXHAUST DAMPERS  
SDAR: CP-84-27 (SUPPLEMENTAL REPORT)

Gentlemen:

On March 6, 1985, TU Electric notified the NRC via report logged TXX-4409 of a reportable deficiency involving the designed failure modes of certain Primary Plant Ventilation System (PPVS) exhaust dampers and several other related issues. Our last report on this subject is logged TXX-6435, dated May 13, 1989. The purpose of this supplemental report is to provide the results of the final resolution and corrective action for SDAR CP-84-27. This report supersedes all previous correspondence on this issue.

Description

The issues included as part of SDAR CP-84-27 are the following:

- (1) It was observed that the designed failure mode (closed) of certain exhaust dampers in the nuclear safety-related PPVS was inconsistent with ensuring that air flow would be maintained from areas of lower to higher potential airborne radioactivity. Evaluation of this concern concluded that although airborne releases internal to the buildings could have been diverted, offsite releases would not have been significantly affected. As a conservative corrective measure, certain PPVS dampers were locked open with power/air supplies disconnected. Locking dampers open was consistent with maintaining exposure as low as reasonably achievable (ALARA), but was not required to maintain doses below acceptable levels.

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(2) The ability of the PPVS to ensure proper cooling (within qualification limits in accordance with NUREG-0588) of safety-related components during credible accident scenarios was evaluated. It was concluded that cooling could not be ensured under all conditions. The original approach to resolution of this concern made provisions to ensure that forced air from non-1E PPVS supply fans could be restored within 72 hours of the Design Basis Accident. This approach also required sealing open or removing 121 dampers, the addition of insulation, other reductions in heat loads, and relocation of equipment. These changes were essentially completed in 1986. Subsequently, during design validation as part of the Corrective Action Program, this approach was replaced with a more conservative approach that did not rely on locking open dampers and restoration of forced air ventilation within 72 hours. This new approach included the following elements:

- o Calculation of time-temperature profiles until steady state temperatures are reached within areas of the Safeguards, Auxiliary, Fuel, and Electrical and Control buildings, assuming total loss of all non-safety related ventilation.
- o Verification of impact of the above temperatures on equipment qualification and identification of unqualified components.
- o For identified components, establishment of an alternate bases for qualification (such as one-time operation immediately after an accident), component replacement, reduction of the heat loads additional cooling.

This evaluation has been completed and required the addition of safety-related ventilation for Room 100 in the Safeguards Building to assure operability of an essential Motor Control Center. Other actions required involve manually securing normal lighting within eight hours in selected rooms of the Electrical and Control, Auxiliary and Safeguards buildings.

(3) The potential for the liberation of hydrogen from process equipment as a result of failures from a seismic event was reviewed. The review identified the Boron Recycle Holdup Tanks as potentially susceptible to such a failure. These tanks are Safety Class 3 and seismically designed, however, a flexible bladder inside the tanks is utilized to prevent contact of the tank contents with the atmosphere, and this bladder is not seismically qualified. Relative to operation of the PPVS, the concern was that following a bladder failure due to a seismic event, the failure modes of certain dampers could allow a buildup of hydrogen in these rooms (207AN and 207AS) resulting in formation of an explosive mixture. To evaluate

the potential for this event, a conservative calculation was performed which demonstrated that the hydrogen concentration at the accessway elevation (810') and light fixture level (819') would not exceed the lower explosive limit for hydrogen. However, at elevations above 830', a potentially explosive mixture may have accumulated. As a result, the fire detection system above elevation 830' in rooms 207AN and 207AS has been upgraded to be explosion proof. The exhaust lamper for the room was sealed open to ensure exhaust flow into the ductwork. HVAC testing demonstrating the adequacy of this design will be completed prior to fuel load.

- (4) A concern involving Class 1E limit switches and solenoid valves mounted on Non-Nuclear Safety (NNS) dampers was evaluated with respect to potential degradation of the Class 1E power supply. The initial review had found the design acceptable because the NSS dampers and ductwork were designed and installed as Seismic Category I. During design validation, the dampers and ductwork were reclassified to seismic Category II. This change in classification is acceptable as seismic Category II design ensures structural integrity. Each damper including associated Class 1E actuators and appurtenances has been evaluated and found to be seismically qualified. The qualification records are contained in the seismic qualification packages for the dampers.

#### Safety Significance

The issue associated with potential diversion of radioactive gases would not have resulted in exceeding 10CFR100 limits, and would not have significantly impaired operator action. Therefore this issue does not meet the criteria for reportability pursuant to 10CFR50.55(e).

The PPVS as originally designed was not required to provide cooling for safety-related equipment during and after an accident. The assumed peak temperature for this condition was 122 degrees F. The evaluation of loss of ventilation, as required by NUREG-0588, demonstrated that this temperature could be exceeded in some areas containing safety-related electrical equipment. This deficiency could have adversely affected the environmental qualification of safety-related electrical equipment. As a result, this deficiency meets the criteria for reportability pursuant to 10CFR50.55(e).

The evaluation of hydrogen release from the Boron Recycle Holdup Tanks was conservative but demonstrated an explosive mixture could have formed in the tank rooms. As a result, we have conservatively concluded that the failure modes of these dampers was a deficiency in design that may have affected the safety of plant operations and is therefore reportable pursuant to 10CFR50.55(e).

The issue related to IE devices on NNS dampers was found to be acceptable. As a result, there is no safety significance associated with this issue and it does not meet the criteria for reportability pursuant to 10CFR50.55(e) or 10CFR21.

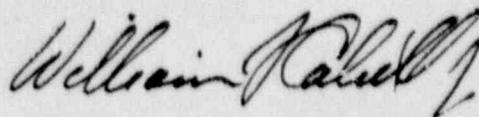
Corrective Action

The status of the Unit 1 corrective action for this issue is as follows:

- (1) No corrective action due to potential airborne radioactivity safety concerns was required for the designed failure modes of dampers. As previously discussed, damper changes were made in some cases for ALARA considerations.
- (2) In order to demonstrate environmental qualification with no credit for non-safety related ventilation, the plant modifications involving insulation, reduction of heat loads, relocation of equipment, and addition of safety-related ventilation were required. Design work to ensure proper cooling of ECCS equipment is complete. The addition of safety-related ventilation for Room 100 will be completed prior to Unit 1 fuel load. Procedures specifying which lighting systems need to be secured during post LOCA conditions coincident with a loss of offsite power are currently in place.
- (3) The changes to the Boron Recycle Holdup Tank exhaust damper requiring it to be locked open, with air and electrical power disconnected, have been completed. An explosion proof fire detection system above the 830' level of Rooms 207AN and 207AS is currently installed. The confirmatory HVAC test will be completed prior to fuel load.
- (4) No corrective action was required for the concern related to IE appurtenances in NNS dampers.

This issue is considered reportable for Unit 2. Differences in corrective action, if any, will be described in future correspondence. All corrective actions necessary for Unit 2 will be completed prior to Unit 2 fuel load.

Sincerely,



William J. Cahill, Jr.

MCP/vld

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