

TXX-3124

ATTACHMENT

April 21, 1980  
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COMANCHE PEAK STEAM ELECTRIC STATION  
CONCRETE HONEYCOMBING  
UNIT 2 - STEAM GENERATOR COMPARTMENTS  
CONCRETE PLACEMENT NO. 201-4812-007

Description of the Deficiency

The subject concrete placement was completed on June 21, 1979 between approximate Elevations 819' and 846'-6" and involved approximately 950 cubic yards of concrete. Due to construction sequencing, formwork remained in place until the first part of October 1979 pending completion of subsequent concrete placements for the core walls to approximately Elev. 860.

Following form removal for the subject placement, routine Quality Control inspection efforts identified and documented areas of the exposed concrete surfaces which did not fully comply with the governing specification in that honeycombed conditions per CPSES procedural definitions were visible following form removal. The horizontal and perpendicular extent of the defects varied from relatively small areas of limited depth (suitable for repair by conventional dry pack techniques) to large areas (on the order of 150 sq.ft.) extending several feet into the walls, the maximum estimated volume of repair concrete being on the order of 3.5 cubic yards.

Following engineering review of the documented deficiencies, the construction forces were authorized in early December 1979 to begin repair of the concrete in one of the compartments. During the process of chipping to sound concrete, Engineering and Senior Quality Control personnel simultaneously expressed concern to site management over the integrity of the inaccessible portions of the placement, particularly that portion of the placement adjacent to the stainless steel liner for the refueling pool. Considering the difficulty of the placement and the results of the repair work to date, site management decided that some additional investigation was required to fully resolve the above stated concerns. The matter was then promptly verbally reported to the NRC Resident Inspector as an item under evaluation for formal reportability within the requirements of 10 CFR 50.55(e).

In early January 1980, the services of a consultant were retained for the purpose of microseismically evaluating the inaccessible portions of the subject placement to identify and correct any internal defects which might be present and not visible from the compartment walls. The non-destructive method employed utilizes pulse echo and resonant frequency techniques and includes the following basic equipment:

- (1) Impactor for the creation of a mechanical stress wave and the energy for an air cavity standing wave.
- (2) A piezoelectric/accelerometer transducer for converting the mechanical energy into electrical energy.
- (3) A signal processor.
- (4) A storage oscilloscope for data presentation and recording.

A series of measurements were taken over a four-day span on a grid pattern within the subject placement from both the liner face towards the exposed compartment walls and from the compartment walls toward the stainless steel liner. The results of these measurements were summarized and subsequently submitted for review by Engineering. Following review, Engineering directed some physical investigations to better ascertain the nature of certain anomalies revealed by the microseismic investigation. These investigations included:

- (1) Removal of small patches of the stainless steel liner at locations determined to represent the more critical anomalies.
- (2) Coring of selected critical areas to evaluate the nature of minor internal defects thought to be present as the result of the microseismic investigation.

On February 14, 1980 and following completion of the above mentioned physical investigations, the consultant returned to the site to review the results of those investigations and to obtain additional microseismic information in areas of Engineering concern. The results of all these investigations have been compiled in an Engineering Report relative to the subject placement, which is available for review at the CPSES site. This report concludes that the inaccessible portions of the subject placement, excluding the honeycombed portions described separately above, meets or exceeds design requirements and contains no hidden internal defects which would be detrimental to the safety or utility of the structure.

Analysis of Safety Implications

Had the honeycombed conditions described previously gone uncorrected, the compartment walls would not have performed structurally under postulated loading conditions and would not have provided the necessary shielding inherent in the design of the compartment walls.

Corrective Action

The honeycombed conditions described above have been or will be repaired using the following basic repair methods as appropriate to the conditions present at specific locations.

- (1) Dry-Pack Mortar
- (2) Non-Shrink Grout
- (3) Replacement Concrete

The repair work is currently scheduled for completion on or before May 2, 1980.