Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381

JUL 29 1991

WBRD-50-390/91-32
WBRD-50-391/91-32

10 CFR 50.55(e)

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

Gentlemen:

In the Matter of the Application of) Docket Nos. 50-390
Tennessee Valley Authority) 50-391

WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2 - VIOLATION OF SINGLE FAILURE CRITERIA FOR CONTROL BUILDING NORMAL PRESSURIZING SUBSYSTEM - WBRD-50-390/91-32 AND WBRD-50-391/91-32 - INTERIM REPORT

The subject deficiency was initially reported to the NRC Operations Center on June 28, 1991, in accordance with 10 CFR 50.55(e) as Problem Evaluation Report (PER) WBP 900366PER. This deficiency was determined reportable as a result of reevaluating the original reportability determination under TVA's commitment in response to Notice of Violation 50-390, 391/90-30-02. Subsequently, the deficiency was upgraded to Significant Corrective Action Report (SCAR) WBSCA910234. Enclosed is our interim report. We expect to submit our final report on or about October 31, 1991.

If there are any questions, please telephone P. L. Pace at (615) 365-1824.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

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Enclosures
cc: See page 2

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U.S. Nuclear Regulatory Commission

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ENCLOSURE 1
WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2
VIOLATION OF SINGLE FAILURE CRITERIA FOR CONTROL BUILDING
NORMAL PRESSURIZATION SUBSYSTEM
SIGNIFICANT CORRECTIVE ACTION REPORT WBSCA910234
WBRD-50-390, 391/91-32 - 10 CFR 50.55(e) INTERIM REPORT

Description of Deficiency

During an evaluation of a Sequoyah Nuclear Plant (SQN) design deficiency (SQP871126, LER 87-039) for applicability to WBN, it was determined that the potential existed for a single failure of the normal Control Building (CB) pressurization subsystem, when operating during a control room isolation (CRI), to violate General Design Criteria (GDC)-19 of 10 CFR 50 Appendix A, "Control Room," and FSAR Section 9.4.1, "Control Room Area Ventilation System." A single failure in the control system for inlet modulating dampers FCO-31-1A or FCO-31-2A associated with normal pressurizing fans A-A or B-B could result in an excessive air supply to the lower floors of the CB. Given this condition, it is possible that pressure in the lower floors of the control building could exceed the pressure in the main control room habitability zone (MCRHZ)[1] thereby allowing unfiltered, potentially contaminated air to enter the Main Control Room (MCR) or Technical Support Center during accident conditions.

During normal operation, one redundant CB normal pressurizing fan supplies approximately 8200 cubic feet per minute (CFM) of outside, unfiltered air to the control building, of which, 3200 CFM is supplied to the MCRHZ and 5000 CFM is supplied to the lower CB floors (elevations 729, 708, and 692) (See Attachment 1). The building is thus pressurized relative to atmosphere to minimize inleakage. The quantity of air is automatically controlled by the modulating dampers, FCO-31-1A or FCO-31-2A, to maintain approximately 1/8-inch water gauge (wg) positive pressure in the MCRHZ and a slight positive pressure in the remainder of the building. Following a CRI, normal pressurizing fan air flow is isolated from the MCRHZ and the fan operates to divert a reduced quantity (8200 CFM to 3000 CFM) of air to the CB lower floors in order to provide a slight positive pressure relative to atmosphere and to provide make up air to the battery room exhaust fans. During the CRI, pressurization of the MCRHZ is accomplished using redundant emergency pressurizing fans to supply approximately 325 CFM filtered (via air cleanup fans) air flow to the MCRHZ. A malfunction of modulating dampers FCO-31-1A or FCO-31-2A or their attendant control elements (pressure differential transmitters, differential controllers, differential pressure operators, or solenoid valves) could result in the modulating dampers failing in a full open position or otherwise failing to modulate properly such that air pressure in the CB lower floors could exceed the 1/8-inch wg pressure in the MCRHZ

Safety Implications

As a result of this deficiency, the increased air flow to the CB lower floors could result in higher than designed air pressures in the lower CB resulting in exceeding the 1/8 inch wg pressure in the MCRHZ. Normal leakage around stairwell doors and wall penetrations could result in unfiltered and potentially contaminated air to infiltrate the MCR and potential radiological exposure to MCR/Technical Support Center personnel in excess of allowable limits specified in GDC-19.

1. The MCRHZ includes all Control Building rooms on elevation 755'-0" including the Unit 1 and 2 Main Control Room.

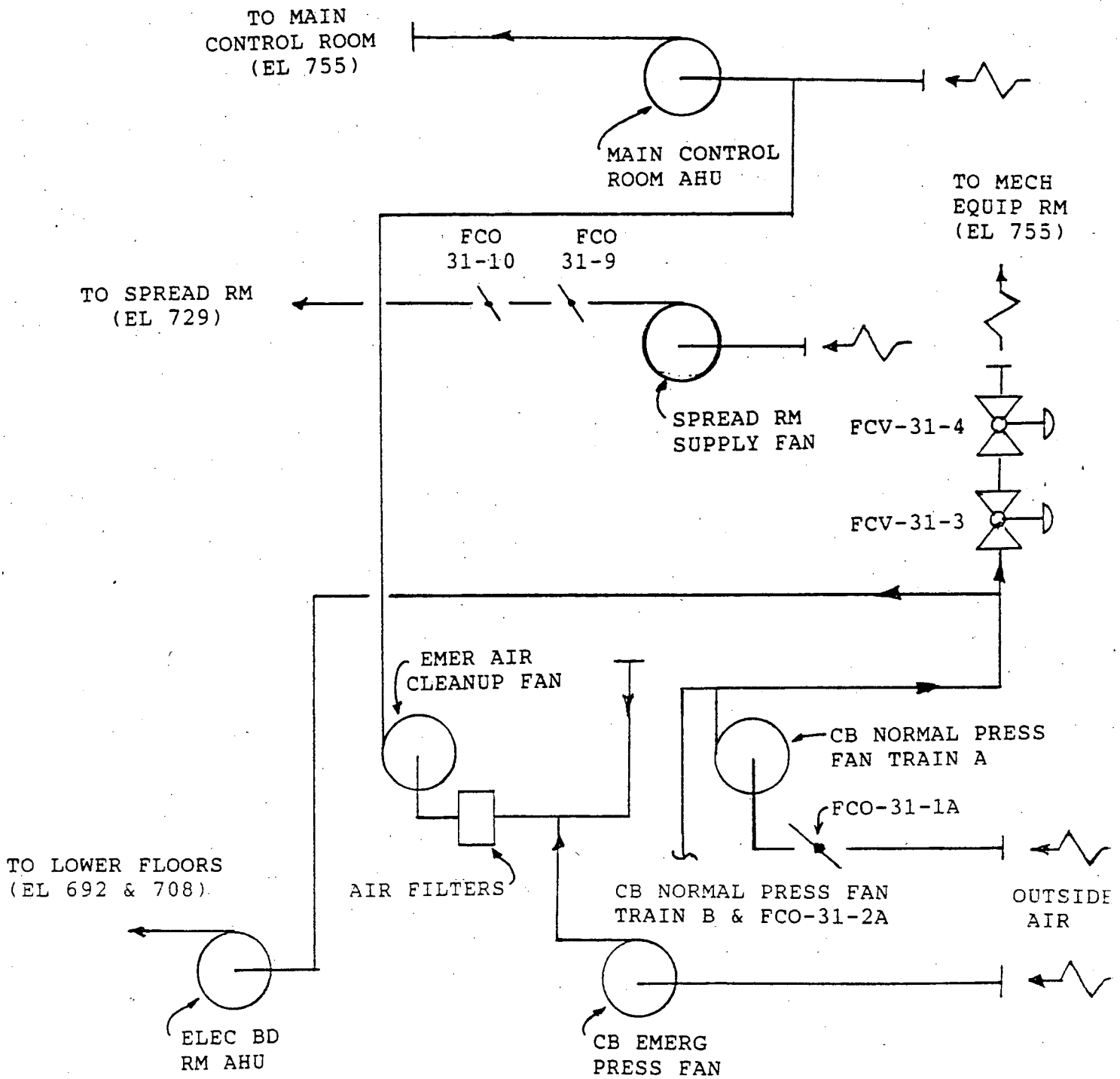
Interim Progress

The cause of this deficiency is under evaluation, but appears to be a failure of the original design to adequately consider all failure modes of the pressurizing fan/inlet damper in the FSAR single failure analysis. Specifically, the design did not consider the effect of excess air flow to the CB lower floors resulting from failed equipment and provide a means to prevent CB lower floor air pressure from exceeding that of the MCRHZ. A similar single failure deficiency resulting from inadequate consideration of the failure modes and effects analysis for the Auxiliary Building Gas Treatment System (ABGTS) was reported to NRC under 10 CFR 50.55(e) on January 30, 1991 (WBRD-50-390, 391-90-07 - CAQR WBP900432). In that report, the consequence of failure to adequately address single failure requirements was reviewed for other filtration systems (Control Room Emergency Cleanup, Containment Purge Air, and EGTS) and found isolated to the ABGTS vacuum relief dampers.

Further evaluation is necessary to determine the cause and extent of condition for the subject deficiency and whether the final report for CDR-90-07 requires revision.

The current design of the CB pressurizing subsystem is being upgraded under DCN-M-10706-A from a pneumatic to an electronic control system to eliminate system inaccuracies. TVA anticipates that under this design change, a differential pressure control system will be installed which will start the redundant normal pressurizing fan/damper assembly upon excess or insufficient pressure conditions. TVA will finalize the cause evaluation, corrective action plan, and schedule for this issue in a final report to be submitted by October 31, 1991.

ATTACHMENT 1



SIMPLIFIED CONTROL BUILDING VENTILATION SCHEMATIC

ENCLOSURE 2

LIST OF COMMITMENTS

TVA will provide a final report for this issue by October 31, 1991. The report will summarize the cause evaluation, corrective action plan, and schedule for this issue including a determination as to whether CDR-90-07 requires revision.