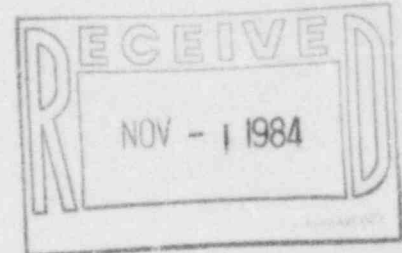


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October 31, 1984

W3P84-2964
Q-3-A35.07.90
3-A1.01.04

Mr. John T. Collins
Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011



Dear Mr. Collins:

Subject: Waterford 3 SES
Docket No. 50-382
SIGNIFICANT CONSTRUCTION DEFICIENCY NO. 90
"Electrical Conduit Overstressed"
Final Report

Reference: LP&L letter W3P84-2673 dated September 21, 1984

The referenced letter states that the final report on SCD-90 was scheduled for submittal by October 26. In accordance with 10CFR50.55(e)(3), enclosed are two copies of the LP&L final report on SCD-90 (R1) with a Justification for Interim Operation.

Very truly yours,

K.W. Cook
Nuclear Support & Licensing Manager

KWC:GEW:sms

Enclosure

cc: NRC, Director, Office of I&E (15 copies)
NRC, Director, Office of Management
G.W. Knighton, NRC-NRR
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FINAL REPORT OF

SIGNIFICANT CONSTRUCTION DEFICIENCY NO. 90 R1

"ELECTRICAL CONDUIT OVERSTRESSED"

INTRODUCTION

This report is submitted pursuant to 10CFR50.55(e). It describes a deficiency arising from the lack of complete installation records regarding verification of conduit and conduit supports installation in accordance with established installation criteria for span and support loading.

To the best of our knowledge, this deficiency has not been reported to the USNRC pursuant to 10CFR21.

DESCRIPTION OF PROBLEM

Electrical conduit installation at Waterford 3 was performed by Fischbach & Moore (F&M). F&M field fabricated and installed conduit supports in accordance with approved designs and their approve' procedure, and inspected them under their quality program. However, records documenting performance of load checks cannot be obtained.

As a result of Ebasco QA Field Surveillance on F&M conduit installation, a program (SCD-90) was developed to further evaluate these installations. This program was implemented by Ebasco and evaluated a large sample of installed conduits inside the RAB and RCB.

SCD No. 90 covers the safe shutdown conduits installed by Fischbach & Moore. A partial listing of these conduits was developed from cable and conduits takeoffs from the Master Equipment List submitted to the NRC as part of the LP&L response to NUREG-0588. It encompasses cables/conduits required to mitigate and/or monitor a Loss of Coolant Accident, Main Steam Line Break or High Energy Line Break.

The list included a total of 1838 conduits which fell into the following categories: 206 were either wrapped in fire barrier material, have been reworked by Ebasco, or were in areas inaccessible to walkdown personnel. 1632 were walked down for span length and support adequacy.

The 1632 conduits walked down included 11,750 conduit spans on 5,342 supports. Overall, three percent of the spans were overlength and three percent of the supports were overloaded or showed evidence of minor hardware defects such as loose bolts. For safety-related conduits only five percent of end spans and two percent of interior spans were overlength and two percent of supports had problems. Evaluations for acceptability were performed against the results of a detailed seismic analysis covering conduit spans by conduit size, orientation, span type, and strap types and also covering six common support types for various sizes, orientations, and types of anchorage; for all other types of supports the maximum loads given by the design drawings were used, or an analysis of the unique support was performed.

Examples of typical worst case over-spans or overloads from the walkdown were selected for analysis and/or testing at Southwest Research Lab, Inc. to determine whether failure resulting in circuit interruption or missile generation would occur.

Please note that it was decided early in the walkdown program to provide supports or adjust conduits to disposition identified nonconforming conditions. This was a parallel effort with the walkdown due to the "worst case" analysis and shaketable test results and schedule.

For items affecting the evaluated conduits and found to be rejectable based on the initial design requirement, the location and type of rework required to correct the condition were identified. They were submitted to Ebasco Construction for performance of rework in case seismic testing of worst case spans or overloads yielded unfavorable results.

The above mentioned analyses and tests indicated that no such failures would occur under design load conditions if left uncorrected.

SCD 90 was reopened in order to address (16) items that were identified during the walkdown, but inadvertently not transmitted to the construction group since the conduit tag numbers were not recorded sequentially. This minor work is complete. An accountability check has been completed. In addition, the scope has been clarified to show that the conduits walked represent approximately 34% of all 1E conduits.

Subsequently, a total of 950 additional conduits were identified to be safe shutdown conduits. They were walked down for span length only, since in the original walkdown it had been found that only 2% of the supports of safety-related conduits had any problems.

New span criteria derived from the Southwest Research Lab test data were developed and applied to this phase of the walkdown.

Additional conduit supports found to be required as a result of this walkdown have been identified.

SAFETY ANALYSIS

The potential impact of this deficiency was that in the event of an SSE, safety related conduit not installed to established installation criteria could have failed in a manner adverse to plant safety. The results of the original walkdown on span length and support adequacy on a large sample of conduits, and the analyses/test results provided a high degree of confidence that even if the situation had remained undetected, there was still reasonable assurance that plant safety would not have been affected. The results of the subsequent inspection for span length of the remaining conduits required for the design basis accidents now provides assurance that the safety-related functions of the Waterford 3 conduit installations would not be adversely affected by an SSE.

CORRECTIVE ACTION

The installing contractor, Fischbach & Moore, has ceased performing field installations; therefore, no corrective action on future installations under their jurisdiction is required.

NCR-W3-6727 was issued to track and document corrective action for the conduit installations identified as deficient prior to analysis/testing.

Erection of the additional supports is not yet complete. This work is being tracked for completion under the IP&L program via CIWA's.

FCR-E-3618 was issued specifying revised design criteria based on the analyses performed. Should future non-conformances relative to the revised criteria be identified they will be dispositioned on a case-by-case basis.

This report is submitted as the revised Final Report.

JUSTIFICATION FOR INTERIM OPERATION

The small amount of corrective action remaining is scheduled to be completed by 11/3/84. All work in the Reactor Containment Building (RCB) will support this schedule. The items remaining in the Balance of Plant (BOP) will be completed by 11/3/84, or shortly thereafter not exceeding initial criticality.

These reworks are not considered a constraint to fuel load for the following reason: Even in the event of failure of conduits due to lack of proper supports, the lack of fission products prior to Mode 2, provides assurance that the health and safety of the public will not be adversely affected.