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July 27, 1983

Docket 50-352, 353

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
US Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: Limerick Generating Station Units 1 and 2
1-Cold Formed Back to Back Channel Shop Welded
Electrical Raceway Supports
2-Electrical Raceway Damping Values

REFERENCE: Telephone Conversation Between NRC Structural
Engineering Branch, Philadelphia Electric
Company, and Bechtel Power Corporation on
July 18, 1983

FILE: GOVT 1-1 (NRC)

Dear Mr. Schwencer:

As agreed to in the referenced telephone conversation, we are submitting, for your information, documentation for the two subject items.

Very truly yours,

Copy to: See Attached Service List

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PDR ADOCK 05000352
S PDR

Boo!
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cc: Judge Lawrence Brenner	(w/enclosure)
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Judge Peter A. Morris	"
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Cold Formed Back-To-Back Channel
Shop Welded Electrical
Raceway Supports

The Superstrut spot welding deficiency was previously described and discussed in the Significant Deficiency Report #5 (attached) of March 1978 which was transmitted to NRC by PECO in a letter dated April 5, 1978.

In early January 1978 the spot welding deficiency of the back-to-back channels at Limerick jobsite was observed. (See para. 2.4 of SDR #5.)

Fifty-five random samples from the stock of strut material at the site were tested by the Anamet Laboratory to Berkeley, California, and witnessed by Bechtel. This served as an exploratory test to establish the basis for further action.

Repairs for the Superstruts installed were required. Stitch welding was used. (See para. 4.1 of SDR #5.) In the interim, pending production of qualified new material by Superstrut Co. in Goshen, Indiana, all strut material for fabrication of any new raceway supports was obtained by repairing existing deficient Superstruts. This was accomplished either by stitch welding or by using replacement material which had been re-spotwelded at the Superstrut Plant at Goshen, Indiana, based on an interim acceptance criteria prepared by Bechtel (Attachment A) and accepted by Superstrut. All strut pieces actually tested and found acceptable were uniquely identified and marked. All pieces not tested but acceptable for shipment were likewise uniquely identified and marked. All rejected pieces were also uniquely marked.

Drawing Change Notice (DCN) No. 68 dated October 9, 1978, for Drawing E-1406 was issued to revise the material specification to include more stringent testing and inspection requirements for raw strut material: "For each field material requisition, periodic shop surveillance shall be required for Superstrut back-to-back channels to assure conformance to Superstrut Procedure 10-T2, revised June 5, 1978 (Attachment B). The rate of Surveillance shall be 100% of the first 500 feet of each type of channels, and this shall be considered as a witness point. For the balance of the shipment release of the type of channel being surveilled, the surveillance rate shall be 25%; and this shall be considered as a witness point."

We consider this a closed issue since no further spotwelding deficiencies on Superstrut have been observed.

Electrical Raceway Damping Values

Electrical raceway analysis and design has been performed using the following damping values: 1) 10% of critical for cable tray systems, 2) 7% for conduit/wireway trapeze support systems, and 3) 5% for conduit/wireway non-trapeze support systems. (Items 2 and 3 use structural damping in accordance with Reg. Guide 1.61.) A concern has been raised relative to the use of fireproofing on electrical raceways and its effect on the damping values used in the analysis.

Certain Class IE electrical raceways (less than 5% of the total) require fire protection in accordance with the new requirements of Branch Technical Position CMEB 9.5-1. The protection on Limerick is provided by raceway fireproofing; the fireproofing is a somewhat flexible plaster-like material which is applied to the electrical raceways by spraying, trowelling or in sheets; none of the fireproofing is applied directly to the cables themselves, and, thus, cable motion is not impaired by the presence of the fireproofing. See attached sketches showing fireproofing on the individual raceway types.

Fireproofing will not reduce the damping ratio used in the analysis and design of fireproofed raceways since the principal mechanism for damping, i.e., the cable motion within the trays, remains unaltered. (See FSAR Ref. 3.7-7, "Development of Analysis and Design Techniques from Dynamic Testing of Electrical Raceway Support Systems", Technical Report, July 1979, Bechtel Power Corporation, Sec. 3.1.)

Further, the fireproofing material itself, due to its somewhat plastic material properties, may provide additional damping mechanisms. It is also noted that the damping values used are conservative since, based on the cable tray test results, higher damping values of up to 20% of critical are recommended for use; and values of up to 50% of critical were observed during testing. Limerick tray systems are structurally similar to the trays used in the LAPD cable tray testing program.

It is concluded that use of fireproofing does not affect the damping values used in the structural analysis of raceway supports.

HWV/dmc 8/3

Attachment

Fireproofing on Electrical Raceways

