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SUBJECT: Forwards response to NRC 850108 request for addl informet small bore piping.INfo covers ongoing audits of piping.&, pipe supports.Procedure P=22, "Coordination of Pipe Support. Loads w/Civil Engineering" encl.

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JAMES D. SHIFFER VICE PRESIDENT NUCLEAR POWER GENERATION

January 18, 1985

PGandE Letter No.: DCL-85-017

Mr. George W. Knighton, Chief Licensing Branch No. 3 Division of Licensing Office of Nuclear Reactor Regulation U. S. Nuclear Regulatory Commission Washington, D.C. 20555

Re: Docket No. 50-323 Diablo Canyon Unit 2 Additional Information on Pipe Supports - Footprint Loads

Dear Mr. Knighton:

As a result of ongoing audits of Unit 2 piping and pipe supports, the NRC Staff identified the need for additional information on small bore piping in a letter to PGandE dated January 8, 1985. Enclosed is PGandE's response to this request.

Kindly acknowledge receipt of this material on the enclosed copy of this letter and return it in the enclosed addressed envelope.

Sincerely.

Enclosures

cc: R. T. Dodds J. B. Martin H. E. Schierling Service List



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ENCLOSURE 1

Request No. 1:

Explain the procedures used to incorporate the Westinghouse small bore piping footprint loads into the design of the civil structures. Include in the explanation how the interface coordination and control between Westinghouse and the Diablo Canyon Project were performed. Include a copy of the procedures in your response.

Response:

The coordination of pipe support loads with Civil Engineering is the responsibility of the Project Plant Design (Pipe Support) Group, including those pipe supports designed or analyzed by consultants, such as Westinghouse.

Project Procedure P-22, Rev. 2, "Procedure for Coordination of Pipe Support Loads with Civil Engineering," has been used since March 15, 1984, by the Diablo Canyon Project (DCP) to incorporate the small bore piping footprint loads into the design of the Unit 2 structures. A copy of P-22 is included as Enclosure 2.

Attachment A to P-22 is used to transmit footprint loads and other pertinent information from the Pipe Support Group to the Civil Design Group for evaluation. The same form is listed as Attachment 5 to the Westinghouse "Pipe Support Design and Evaluation Procedure, CD-107" applicable to Diablo Canyon Unit 2.

Westinghouse tabulates the footprint loads and sends Attachment 5 to CD-107 to DCP's Pipe Support Group to be coordinated with the Civil Design Group, if either:

- the footprint loads of a small bore pipe support are 500 lbs or more and the support is attached to the main structural members of the annulus frame, or
- regardless of load magnitude, the support is attached to secondary members of the annulus steel (such as bracing members), to platforms, or to the containment liner plate.

The DCP Pipe Support Group prepares a footprint load data package consisting of Attachment 5 to P-22, support details, STRUDL mathematical model and printout (optional) and delivers it to the DCP Civil Design Group along with a transmittal form.

The DCP Civil Design Group reviews the package and, if the loads are acceptable, signs on the bottom part of the form to indicate approval and returns it to the Pipe Support Group. The Pipe Support Group then updates the pipe support status log to indicate that Civil verification/approval has been obtained and proceeds with the issue of the pipe support drawing or the implementation of the design change, whatever the case may be.

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If the support loads imposed on a structure are not acceptable, the Civil Design Group states the reason for rejection and recommends a possible resolution to the problem. The package is then returned to the Pipe Support Group for their action. The support package may be sent back to Westinghouse for resolution/redesign and resubmittal for a second cycle of Civil verification.

Request No. 2:

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Explain the reason for the changes in the Westinghouse document CD-107 from revision 5 to revision 7 in the small bore criteria summary, Section 4.8.

Response:

Revision 6 of Westinghouse document CD-107, "Diablo Canyon Unit 2 Pipe Support Design and Evaluation Procedure," updated Section 4.8, "Small Bore Criteria Summary," to add the DCM M-9 (Guidelines For Design of Class I Pipe Supports), Revision 11 requirement that self-weight excitation loads be considered for all new small bore pipe supports issued after the issue date of DCM M-9, Revision 11, July 31, 1984.

Revision 7 of CD-107 revised the same section to:

- Amend the effective date of DCM M-9, Revision 11, from July 31, 1984, to August 2, 1984
- Add the requirement that small bore pipe support footprint loads must be tabulated and sent to the DCP for Civil review and approval (in accordance with the revised Procedure P-22, Rev. 2) if either:
 - the footprint loads are 500 lbs or more and the support is attached to the main structural members of the annulus frames, or
 - regardless of load magnitude, the support is attached to secondary members of the annulus steel (such as bracing members), to platforms, or to the containment liner plate.

Procedure P-22 was revised to explicitly account for pipe support modifications occurring after verification walkdowns had been performed to verify the adequacy of structures for existing small bore pipe support configurations. Further, the revision would prevent continuous modifications and revisions to the structure.

Request No. 3:

Provide the rationale used to develop the criteria where a footprint load of 500 lbs. or less attached to main structural members of the annulus does not have to be routed to the DCP Civil Department for review. Include the definition of main structural members in your response. ۵ ۲ ۲ ۲

Response:

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Based on a detailed walkdown performed in early 1984, it was established that more than 80% of the piping supported on the annulus steel consisted of large bore piping. It was further verified that of all the small bore piping supported from the annulus framing, a majority (approximately 80-90%) were pipes with a diameter of 1-inch or less with a maximum dead load of 3 lbs/lineal foot. Based on a maximum allowable span of 8 feet for 1-inch pipe, the support reaction would be 24 lbs which is significantly less than 500 lbs.

The uniform dead loads indicated on PGandE Drawing Nos. 469355, 469356, 469357, and 469358, Rev. 4 (which were provided to NRC during their audit of January 15 through 17, 1985) were reviewed to see if the loads were conservative based on the number of small bore pipes supported from the annulus steel. The uniform loads from these drawings for the tributary area shown were distributed to the tangential and radial beams. To add further conservatism, these loads were multiplied by the peak acceleration for that elevation, and applied simultaneously in three directions for the Hosgri and in two directions for DE and DDE.

Based on the above, it was established that for main members of the annulus the loads from small bore pipes were adequately addressed.

To ensure that pipe hangers having less than a 500 lb reaction force do not cause web crippling, excessive torsion, or bending about the weak axis of structural members, the Civil Group performed a field walkdown in early 1984. Also, informal walkdowns periodically take place when the design engineers visit the jobsite. A recent walkdown has confirmed the adequacy of annulus steel for small bore piping hanger loads.

The main members of the annulus structure are the tangential and radial beams and the columns as shown on PGandE Drawing Nos. 443371, 443373, and 443380, which were provided to the NRC during their audit of January 15 through 17, 1985. . .

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