



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

NOV 8 1979

Docket No. 50-344

Licensee: Portland General Electric Company (PGE)

Facility: Trojan Nuclear Plant

SUMMARY OF MEETING HELD ON OCTOBER 26, 1979, WITH PORTLAND GENERAL ELECTRIC COMPANY AND BECHTEL TO DISCUSS STRUCTURAL INTEGRITY OF WALLS CONSIDERING PIPING AND EQUIPMENT SUPPORT REACTIONS AT TROJAN NUCLEAR PLANT

On October 26, 1979, the NRC staff met with representatives of PGE and Bechtel to discuss the structural integrity of certain Trojan walls considering piping and equipment support reactions under earthquake conditions. A list of attendees is contained in Attachment I. Highlights of the meeting are summarized below. Attachment 2 served as the meeting agenda.

On October 12, 1979, Trojan was shut down to repair primary-to-secondary leakage in the A and D steam generators and to conduct an inspection of piping supports in inaccessible areas as required by IE Bulletin 79-14. The plant is currently in the cold shutdown condition. Both the A and D steam generator manways are open. The reactor coolant system is drained to the "half-pipe" level of the reactor vessel nozzles. Decay heat is being removed in the normal manner using the residual heat removal (RHR) system.

In continuing the inspections required by Bulletin 79-02 and 79-14, a problem was discovered in seismic anchor SA-83. This device anchors a portion of the pipe that connects the RHR system to the spent fuel pool and is used when the reactor core has been transferred to the spent fuel pool. This pipe is connected to the suction header which joins both RHR pumps. The problem that was discovered was that the structural integrity of the wall to which SA-83 was attached (by concrete expansion anchor bolts) was not adequate to resist reaction forces from attached piping.* This wall separates the east and west RHR pump rooms, and, as it rises from el. 5', becomes a pipe chase separating the two trains up to el. 45'.

The finding was identified as a possible problem on October 17, 1979 while conducting a base-plate flexibility analysis for SA-83. By October 19, after further investigation of the matter, the SA-83 problem was confirmed, and orally reported to NRC that day. This was subsequently confirmed in writing by PGE on October 22, 1979.

*A double wythe concrete block wall, with grouted cells and rebar.

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An immediate action letter was transmitted by IE Region V on October 22, 1979, confirming PGE's commitment to provide NRC with full information as to the nature and extent of the problem - and corrective action - prior to resuming operation.

The SA-83 anchor is especially important since its failure could result in significantly exceeding yield stress in the common suction line from the normal RHR letdown path. This could result in the loss of capability of both RHR pumps from taking suction from the reactor coolant system and the refueling water storage tank (RWST).

Bechtel explained that, with respect to this one wall, normal design procedures were apparently not followed in that the wall was not checked following the detailed pipe support design (by Bergen-Patterson) to ensure its adequacy to carry reaction forces from attached piping.

As a result, this wall must either be strengthened or equipment/piping attached to other places to reduce the load on the wall. At the present time, SA-83 is being removed from this wall. The pipe will be attached to a steel beam spanning the other walls. This is scheduled for completion by Sunday, October 27, 1979, at which time all RWST and RHR suction piping will be below yield and would be considered operable.* In the interim, PGE has developed procedures to maintain core cooling in the event of a severe earthquake and associated pipe rupture. This procedure was discussed at the meeting and is described in Attachment 3. The NRC staff stated that the reactor vessel level instrument should be made redundant or readily recoverable and that the 2 submersible pumps should be set in place. Restoration efforts should put first priority on the normal RHR system.

PGE/Bechtel is investigating to see if the problem with the wall associated with SA-83 is an isolated case or if the problem extends to other walls. A survey of similar concrete block walls and attached equipment/pipe anchors, restraints, and supports is underway.

As for the SA-83 wall, there are 48 supports attached to it. Results:

- 24 - Acceptable as is.
- 24 - Corrective action being taken as follows:
 - 5 - to be thru-bolted
 - 19 - to be removed from wall**

*All such piping will not necessarily be below Code allowable stresses, however, until further investigations/modifications are completed.

**Removal does not in all cases indicate it was required. In some cases, due to piping geometry, it was easier to accomplish.

PGE/Bechtel has to date conducted a walk-down of 21 similar walls with similar large supports. The 21 walls were selected on the basis of wall thickness and whether or not piping/equipment was attached thereto.

No shear walls are involved at this point. Walls less than 14" thick with attached piping 3" or greater or having significant mechanical equipment supports are being investigated. Sixty-two supports on the 21 walls have been identified.

Forty-five of the 62 were of priority interest because they are associated with piping in reactor cooling systems: safety injection, RHR, charging, boron addition.

Results:

- 10 - Acceptable as is.
- 23 - To be thru-bolted instead of anchor-bolted to pick up both wythes of concrete block.
- 12 - To be removed from wall.

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The balance (17 of 62) are of lesser priority (spray system, isolable parts of safety injection and RHR system, component cooling water, room coolers, etc.) and are not associated with normal reactor cooling systems in the present shutdown mode.

PGE estimates that 10 days to 2 weeks will be required to complete the wall/support survey and complete any necessary corrective action.

Bechtel stated that the problems identified to date are due to either:

- (a) lack of post-design hanger review or
- (b) questionable adequacy of the original design criteria for the walls considering support reactions.

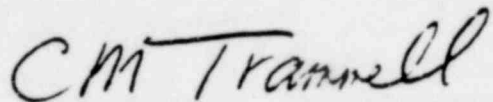
To expedite the return to operation of Trojan, Bechtel stated that many of the changes are being made on the conservative side to save analysis time. Some supports are in the "judgment call zone" and are being modified also to dispense with possible differences of opinion. For example, if only one wythe of a double wythe concrete block wall is questionable or is in the judgment zone, it was decided to thru-bolt the support to pick up both wythes to eliminate any question of adequacy.

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The 21 walls studied to date were picked because of their importance to reactor cooling in the present cold shutdown mode. Some 80 walls in all will be checked. Any necessary corrective action to restore the wall/support system integrity to appropriate levels will be accomplished prior to plant startup.

PGE will be documenting this problem and associated corrective action in a written 14-day report required by the Technical Specifications.



C. M. Trammell, Project Manager
Operating Reactors Branch #1
Division of Operating Reactors

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Docket Files
NRC PDR
Local PDR
ORBI Reading
NRR Reading
H. Denton
E. Case
D. Eisenhut
B. Grimes
R. Vollmer
J. Miller
L. Shao
W. Gammill
G. Zech
A. Schwencer
D. Ziemann
P. Check
G. Lainas
D. Davis
B. Grimes
T. J. Carter
T. Ippolito
D. Crutchfield
R. Reid
V. Noonan
G. Knighton
D. Brinkman
P. T. Kuo
Project Manager
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C. Parrish/P. Kreutzer
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St. Helens, Oregon 97501

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Ms. Nina Bell
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List of Attendees
Structural Integrity of Walls
Supporting Piping and Equipment

Trojan Nuclear Plant

October 26, 1979

NRC Staff

C. Trammell
K. Herring
B. D. Liaw
H. Wong
J. Gray
H. McGurren
G. Lanik
J. Zudans
K. Wichman
G. Lainas

PGE

W. Lindblad
D. Herborn
T. Bushnell
F. Rogan

Bechtel

W. White
D. Halligan
D. L. Damon

Other

M. Axelrad, Lowenstein, Neuman, Reis, Axelrad, & Toll
B. Churchill, Shaw, Pittman, Potts & Trowbridge

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Items to be addressed by PGE at 10/24/79 meeting RE:Structural integrity of walls considering piping and equipment support reactions,

- 1) Detailed description of the condition (i.e. failure to design structural elements for support reactions) on the Aux. Bldg. wall on which the problem was first identified.
- 2) Reasons for the existence of this condition.
- 3) The extent to which this condition exists elsewhere and the basis for this determination
- 4) Status of the review of other walls or other areas where this condition exists.
- 5) All systems, safety and non-safety, potentially affected.
- 6) Criteria (loads, and load combinations and acceptance criteria) for the evaluation of existing walls, any necessary modifications, and the evaluation of the equipment and piping.
- 7) Potential License violations including bases for determinations in this regard.
- 8) Postulate failure of all systems attached to the walls of the Control/Auxiliary/Fuel Bldg. complex. Discuss your contingency plan to provide core cooling capability and the time periods in which it is necessary to initiate this plan.

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Alternate Core Cooling Procedure

Present Plant Conditions (as of 10/26/79)

Tav=135°F
Shutdown time = 14 days
Decay heat = 30 million BTU/H
1 RHR loop in operation
Required makeup rate (boiling heat transfer) = 60 gpm
Time to boil = 1.1-1.2 hrs

Procedure (Reviewed and concurred by on-site and off-site review committees)

1. Open manual vessel head vent valve.
2. Use accumulators to inject flow to vessel intermittently. 7-8 hours of makeup available. Only 4 hrs assumed available to account for spillage.

Note: Without makeup at all,
it would take 4 hrs. for
vessel water level to drop
from the 1/2 pipe level to
the top of the fuel.

3. Connect electric - driven submersible pump from RWST via fire hose to another submersible pump. Connect to test vent on hot leg SIS injection lines outside containment. 4 hrs. assumed for rigging time 4 day water supply from RWST.
4. Connect containment recirculation sump discharge line vents to a pump and heat exchanger (turbine bearing heat exchanger), thence to SIS lines as above.
5. If any line from RWST ruptures, RWST would drain to Aux. Building, el.5' and flood to about el.20'. Follow step 3 as above, except place pump in aux. bldg.
6. Use diesel-driven fire water pump (intake structure) to supply containment cooling function.

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PGE Portland General Electric Company

Donald J. Boerl Assistant Vice President

To:	C. TRAMMEL
U.S. NRC	Bethesda, Md.
From:	PGE/ L. ERICKSON
Date:	11/4/79
Receipt Confirmed:	
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November 4, 1979

Mr. R. H. Engelken, Director
 U.S. Nuclear Regulatory Commission
 Region V
 Suite 202, Walnut Creek Plaza
 1990 N. California Blvd.
 Walnut Creek, CA 94596

Dear Mr. Engelken:

As indicated in Portland General Electric's letter, CPY-450-79 dated October 22, 1979, confirming the oral report on October 19, 1979 of an inadequate seismic restraint on the Spent Fuel Pool Cooling System (SA-83), enclosed is Licensee Event Report 79-15 which describes potential local overstress conditions in walls due to loads from attached seismic restraints on several safety systems. Our investigation and analyses to date are described in the enclosed Reportable Occurrence. I was advised by Mr. Faulkenberry of your office on Friday, November 2, 1979 that it would be acceptable to file the attached report by November 5, 1979 even though Technical Specification 6.9.1.8 would require submittal by November 2, 1979.

We have concluded that Technical Specifications 5.5.I and 5.7.I have been violated with respect to the design and installation of a small percentage of the seismic pipe restraints at Trojan. At this time we do not believe that a license amendment will be necessary since all safety-related pipe supports and restraints installed in block walls similar to the one to which SA-83 is attached will be evaluated, the evaluation results will be reported in accordance with your letter dated October 22, 1979 to C. Goodwin, Jr., and necessary modifications or repairs will be performed. A preliminary schedule of our planned investigations, modifications, and supplemental reports prior to resumption of Plant operation is provided with this report.

Sincerely,

Don

c: Mr. A. Schwencer, Chief
 Operating Reactors Branch #1
 Division of Operating Reactors
 U. S. Nuclear Regulatory Commission

Mr. Lynn Frank, Director
 State of Oregon
 Department of Energy

DUPLICATE DOCUMENT

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