



Portland General Electric Company

James E. Cross
Vice President and Chief Nuclear Officer

March 28, 1994

Mr. Jack R. Strosnider, Chief
Materials and Chemical Engineering Branch
Division of Engineering
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Mr. Strosnider:

On November 24, 1993 and January 7, 1994, PGE asked Westinghouse Electric Corporation to indicate why indications of cracking in Trojan steam generator tubes, which were noted by a Westinghouse inspector to be "circumferential," should not be considered circumferential cracking. PGE has provided you with relevant information on this issue and by this letter provides you with the latest Westinghouse reply, dated January 21, 1994, but received by PGE on March 17, 1994.

We are disappointed in the Westinghouse reply. We believed we were asking Westinghouse for information which would already be available as part of their safety evaluation of the cracking found at Trojan. Westinghouse appears not to have done a safety evaluation of the December 1992 inspection results which we called to their attention. We understand from its letter that Westinghouse does not believe further assessments are necessary to complete a Part 21 evaluation.

Westinghouse suggests that many of the points we raised be readdressed to Westinghouse "through proper commercial channels." However, because Trojan has been permanently shut down, further steam generator studies by Westinghouse are not being funded by PGE. To the contrary, PGE is presently involved in litigation against Westinghouse seeking recovery of, among other things, past costs of this kind.

PGE has fulfilled its responsibilities by reporting the relevant information to you. As the regulator of nuclear plant safety, including matters relating to steam generator tube integrity, you may want to independently pursue the issues raised

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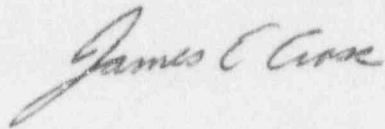
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*See attached
John Linton*

Mr. Jack R. Strosnider
U.S. Nuclear Regulatory Commission
March 28, 1994
Page 2

in our letters with Westinghouse. We would be interested in hearing their answers and your conclusions.

Sincerely,

A handwritten signature in cursive script that reads "James E. Cross". The signature is written in dark ink and is positioned below the typed name "Sincerely,".

enclosure

c: Kenneth E. Perkins, Jr.
Acting Regional Administrator
U.S. Nuclear Regulatory Commission, Region V



Westinghouse
Electric Corporation

Energy Systems

Box 355
Pittsburgh Pennsylvania 15230-0355
January 21, 1994
NTD-NSL-SSL-94-018

VICE PRESIDENT

MAR 17 1994

CHIEF NUCLEAR OFFICER

Mr. James E. Cross
Portland General Electric Company
Vice President and Chief Nuclear Officer
121 SW Salmon Street
Portland, OR, 97204

Dear Mr. Cross:

This correspondence is provided in response to your letter dated January 7, 1994. With the exception of items 1, 3, 9 and 10 in your letter, in which an immediate response is provided, Westinghouse will be glad to respond to each request for clarification through the proper commercial channels. Please contact Chuck Yarbrough, District Sales Manager, (503) 624-4031 so that your request can be processed.

Concerning item (1) of your letter, please contact the Electric Power Research Institute directly to obtain a copy of NP-7480-L, Volume 1, Revision 1, entitled "Steam Generator Tubing Outside Diameter Stress Corrosion Cracking at Tube Support Plates - Database for Alternate Repair Criteria, Volume 1: 7/8 Inch Diameter Tubing".

Concerning item (3) of your letter, further structural assessment of the Trojan steam generator tubes to complete a Part 21 evaluation does not appear to be necessary. Based on a memorandum from Lawrence C. Shao, Director, Division of Engineering, Office of Nuclear Reactor Regulation Research, to Eric S. Beckjord, Office of Nuclear Regulatory Research", sent January 5, 1993, it was concluded that the operation of the Trojan plant for the remainder of Fuel Cycle 14 (for a period of approximately 4 months) was acceptable. The justification was based on:

1. Destructive examination of steam generator tubes pulled from the Trojan plant revealed cracks that are generally confined within the thickness of the tube support plates.
2. Burst tests from cracked tubes pulled from the Trojan Plant exhibited burst capability well in excess of RG 1.121 acceptance criteria.
3. Stress corrosion crack growth rate results indicate that incremental growth of cracks to a critical length beyond the tube support plate during one fuel cycle is unlikely. [As noted in your May 20, 1993 letter to the NRC, Westinghouse Electric Corporation conducted an evaluation of the eddy current voltage growth rates for Cycle 14 operation prior to the November 9, 1992 tube leak and compared the results with the prior analysis of growth rates included within WCAP-13129, "Trojan Nuclear Plant Steam Generator Tube Repair Criteria for Indications at Tube Support Plates". Although this evaluation was never completed, preliminary results indicated that the voltage growth rate from 1991 to 1992 was in agreement with the rate defined in WCAP-13129].

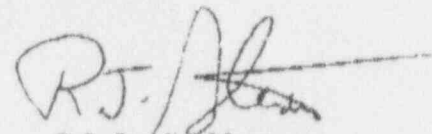
4. The probability of a main steam line break event is very low for one cycle. Destructive examination results (reported in WCAP-13129) were obtained from eight tubes (23 indications) from the Trojan steam generators in 1991 to characterize the localized tube wall degradation. About one half of these tube support plate elevation indications had morphologies comprised of stress corrosion cracking (SCC) with small patches of cellular corrosion. The cellular structure consists of SCC at the edges of each cell with no tube degradation within the cell. In general, the axial indications are more continuous or longer with the oblique cracks being short cracks between axial indications. To date, radial metallography results show that the cellular corrosion pattern changes to purely axial indications at depths of 40 to 60% tube wall penetration. Tube burst capability for tubes experiencing cellular corrosion is dominated by the length and depth profile of the limiting macrocrack and is insignificantly influenced by multiple indications and cellular patches. The presence of cellular corrosion is factored into the development of an interim plugging criteria and it is expected that its presence was considered in the NRR staff decision to accept the remainder of Cycle 14 operation of the Trojan Nuclear Plant.

Concerning item (9) of your letter, only the second support plate intersection of R32C75 was inspected by ultrasonic testing (UT). The data in the referenced Wagner letter is incorrect in specifying tube support plate (TSP) 1 as you will note that the UT plots attached to this letter are for TSP 2. The acquisition date of July 14, 1993 on Figure C-13 refers to processing dates of the UT data. The dates refer to additional processing of the December 1992 field data with an updated UTEC software package and the print date. All data is from December of 1992.

Concerning item (10) of your letter, a draft report was sent to the NRC in September and the final report was issued in December of 1993. It was decided to include colored plots in the final report and the plots were reprinted on December 2, 1993.

Please do not hesitate to contact me (412) 374-4311 if I can be of any further assistance.

Sincerely,



R.J. Sterdis, Manager
Safety Systems Licensing

/GWW/hs

January 21, 1994
NTD-NSL-SSL-94-018

bcc: W. D. Fletcher - W STC
H. A. Sepp - WEC-E 4-07A
N. J. Liparulo - WEC-E 4-10
J. J. McInerney - WEC-E 4-15
T. A. Pitterle - W Waltz Mill
L. A. Campagna - WEC-E 5-33
G. W. Whiteman - WEC-E 4-15