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STAHLE,C. NRC - No Detailed Affiliation Given

SUBJECT: Provides info re LOFTTR2 computer program & schedule for updating methodology & revising WCAP-11668 results.

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May 23, 1988

U.S. Nuclear Regulatory Commission
Document Control Desk
Attn: Mr. Carl Stahle
PWR Project Directorate No. 1
Washington, D.C. 20555

Subject: Three Month Submittal - Required by Safety Evaluation Related to Steam Generator Tube Plugging at 15 Percent Level
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

Reference: (1) February 23, 1988 Letter from C. Stahle (NRC) to R.W. Kober (RG&E), "Issuance of Amendment to Facility Operating License No. DPR-18".

Dear Mr. Stahle:

The Safety Evaluation related to increasing the steam generator tube plugging level to 15 percent (Reference 1) required a submittal which described the LOFTTR2 computer program and a schedule for updating the methodology and revising the WCAP-11668 results to account for steam generator (SG) tube uncovery during a steam generator tube rupture (SGTR) event. The purpose of this letter is to supply the required information.

SCHEDULE FOR METHODOLOGY UPDATE AND WCAP REVISION

A program to update the dose methodology associated with SG tube uncovery during a SGTR event has been developed by Westinghouse Electric Corporation for the Westinghouse Owners Group (WOG). The program was presented to the Analysis Subcommittee of the WOG. The Subcommittee recommended WOG approval of the program. The program will be presented to the full WOG for approval at the next meeting in June 1988. If the program is approved, the updated methodology will be used to revise the results in WCAP-11668. The revised results would be submitted after NRC review and approval of the updated methodology. This is expected to occur sometime in 1989. If the program is not approved by the WOG, RG&E will apply existing methodology and revise the results in WCAP-11668. The revised results would be submitted on a schedule to support the ongoing NRC review effort of WCAP-11668 which provides the basis for our Application for Amendment dated February 18, 1983.

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LOFTTR2 COMPUTER PROGRAM

The description of the LOFTTR2 code was supplied by Westinghouse Electric Corporation and is presented in the attachment to this letter.

Very truly yours,

Bruce A. Snow
Superintendent
Nuclear Production

ATTACHMENT

LOFTTR2 COMPUTER PROGRAM

As indicated in Reference (1), the LOFTTR2 computer program was used to perform the SGTR analysis for Ginna with 15% steam generator tube plugging (WCAP-11668), rather than the LOFTTR1 program which was used to perform the previous analysis for 10% tube plugging (WCAP-10884). The LOFTTR1 program was originally developed to support the revised SGTR analysis methodology which was developed as part of the Westinghouse Owners Group (WOG) SGTR Subgroup program to resolve the SGTR licensing issues. The LOFTTR1 program was developed by modifying the LOFTRAN analysis model (Reference 2) to incorporate changes in the tube rupture break flow model and the steam generator secondary side representation, and also to improve the capability to simulate operator actions. The LOFTRAN break flow model was modified to predict a more realistic break flow rate for a double-ended tube rupture. The secondary side representation was changed from a single region, homogeneous, saturated mixture for the steam and water phases to a two region model with the steam and water phases represented separately. The LOFTTR1 program was validated by comparing the calculated results with the transient data from the Ginna SGTR event on January 25, 1982. The modifications which were made to the LOFTRAN program and the validation studies for the LOFTTR1 program are described in WCAP-10698-P-A. The LOFTTR1 program was also used for the evaluations which were performed by the WOG SGTR Subgroup to demonstrate margin to overfill and to determine the offsite radiological consequences for an SGTR. The results of these evaluations are presented in WCAP-10698-P-A and Supplement 1 to WCAP-10698-P-A. The revised SGTR analysis methodology based on the use of the LOFTTR1 program was approved by the NRC in SERs issued on December 17, 1985 and March 30, 1987.

Although the LOFTTR1 program provided an improved prediction of the secondary response for an SGTR, the program did not have the capability to calculate the secondary conditions if steam generator overfill should occur and only water is present in the steam generator. Thus, in order to use the LOFTTR1 program if overfill should occur, the secondary volume had to be fictitiously increased to prevent overfill from occurring in the analysis. The amount of overfill was then determined by comparing the calculated final secondary water volume with the actual total steam generator volume. This method was used for the SGTR analysis for Ginna with 10% tube plugging which was performed previously with the LOFTTR1 program and reported in WCAP-10884.

As part of the WOG SGTR Subgroup Program, an analysis was also performed to demonstrate that the consequences of steam generator overfill are acceptable. To facilitate the overfill analysis, the LOFTRR1 program was modified to include the capability to represent the transition from a two region secondary (steam and water) to a single water region as overfill occurs, and the transition back to two regions again depending upon the calculated secondary conditions. This extension of the LOFTTR1 program was designated as LOFTTR2. The LOFTTR2 program is identical to LOFTTR1, with the exception of the changes to accommodate steam generator overfill and a few other minor changes which were incorporated to improve the program performance. The LOFTTR2 program was validated against the LOFTTR1 program for the Ginna SGTR event and the results of the two programs are essentially identical prior to steam generator overfill. The LOFTTR2 program was then used in the WOG SGTR Subgroup program to evaluate the consequences of overfill due to an SGTR and the results were presented in WCAP-11002. The NRC reviewed the analysis of the consequences of overfill in WCAP-11002 as part of the review of the revised analysis methodology, although an SER was not issued specifically for WCAP-11002. Since the LOFTTR2 program is essentially identical to the LOFTTR1 program except for the modifications to accommodate overfill, it is appropriate to use LOFTTR2 in lieu of LOFTTR1 to perform SGTR analyses, particularly for cases in which overfill may occur. Thus, the LOFTTR2 program was used to perform the SGTR analysis for Ginna with 15% tube plugging because of the improved capability to accommodate overfill. On this basis, Westinghouse considered that the LOFTTR2 program should replace the LOFTTR1 program as the NRC approved model for performing SGTR analyses.

(1) December 24, 1987 Letter from R.W. Kober (RG&E) to C. Stahle (NRC), "Maximum Coolant Activity Technical Specification"

(2) T.W.T. Burnett, et.al., "LOFTRAN Code Description", WCAP-7907-P-A, April 1984 (Proprietary)