



Idaho National Engineering Laboratory

December 7, 1993

Mr. Frank R. Orr
U. S. Nuclear Regulatory Commission
OWFN - 8 E23
Washington, DC 20555

L2419, TASKS 8 & 9 - LOFTRAN AND NOTRUMP REVIEW - JDB-22-93

Dear Mr. Orr:

Pursuant to the statement of work in FIN L2419, tasks 8 and 9, we have completed our preliminary reviews of two Westinghouse transient computer codes, LOFTRAN and NOTRUMP, as they pertain to the analysis of the AP-600 Advanced Light Water Reactor.

The submitted documentation does not constitute the methodology that Westinghouse intends to use in its AP-600 analysis. To address the capabilities of LOFTRAN and NOTRUMP for AP-600 licensing applications, information on how the codes will be used, models and assumptions to be utilized, and evaluation data bases and experiments identified for assessment should be made available. With the information we have been provided, we found both codes to be lacking in areas that have been identified as important to the analysis of the AP-600. Until we can review how LOFTRAN and NOTRUMP are to be used in AP-600 analyses, we can only describe areas of potential concern.

The current financial status of these two tasks is very good, with \$26K and \$14K remaining in tasks 8 and 9, respectively. This funding is available to resume our review of these two codes once a response to our preliminary questions has been received.

If you have any questions concerning these two documents, please contact me at (208) 526-9089, or Cal Slater, at (208) 526-0626.

Sincerely,

J. D. Burtt
NRC Thermal Hydraulic
Analysis Programs

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Enclosure(s):
As Stated

cc: R. Caruso, US/NRC, OWFN 8 E2
W. H. Rettig, DOE-ID/EITC, MS 1219



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Enclosure 3

RE: AP600 VERSIONS OF NOTRUMP AND LOFTRAN

1. Generally describe the AP600 system(s) and how it responds to SBLOCA's and other SSAR Chapter 15 events. Discuss in detail differences in this design from conventional W designs and differences in how this plant design responds from how conventional W designs respond.
2. Generally describe the version of NOTRUMP (LOFTRAN) applied to AP600. In detail, discuss how this version differs from the approved version applied to conventional W designs.
3. Identify differences in phenomena which occur in Chapter 15 events between AP600 and conventional W designs.
4. Discuss and justify how the AP600 version of NOTRUMP (LOFTRAN) addresses each of these phenomenological differences, including instances in which the AP600 version is the same as the conventional version.
5. Discuss inputs and assumptions to analyses using the models, and justify that they properly reflect AP600 and the differences between AP600 and conventional W designs (include nodding diagrams).
6. Discuss user options and decisions which are made in applying the models to AP600.
7. Discuss and justify analysis evaluation criteria applied to AP600 events using these models.
8. Provide the results of various sensitivity studies (e.g., time and volume nodding studies, etc.) which demonstrate the stability and convergence of the models for AP600 convergence.
9. For NOTRUMP, in detail, explicitly justify that the AP600 version satisfies the requirements of Appendix K.
10. Identify what sensitivity studies will be performed to identify the "worst case" assumptions for AP600 Chapter 15 events.
11. Identify empirical data which demonstrates and justifies any of the above responses.
12. Enclosed are preliminary contractor reports, written based on anticipatory reviews of AP600, LOFTRAN, and NOTRUMP. While these reports are not written in question form, each item in the reports should be explicitly addressed in the above responses.
13. Any references in the above must be detailed and readily available to the NRC staff and its contractors (or provided enclosed with the response).
14. A copy of any submitted documentation supporting the AP600 versions of NOTRUMP and LOFTRAN must also be sent to Frank Orr (NRC/DSSA/SRXB/O-8, E-23).
15. *Justify 1-D modelling of key components, such as CMT, PRHR, etc.*

RSB CODE REVIEW SCHEDULE

- 7/94 - Responses due on RAIs for Volumes 1&2 of CQD*
- 8/94 - Responses due on RAIs for Volume 3 of CQD*
- 9/94 - Responses due on RAIs for Volume 4 of CQD*
- 9/94 - AP600 Code Applicability Document for WC/T to staff*
- 11/94 - Applicability document for NOTRUMP/LOFTRAN due to staff*
- 11/94 - Second round RAIs on WC/T due to Westinghouse*
- 11/94 - RAIs on WC/T CAD due to Westinghouse*
- 1/95 - Responses to 2nd round RAIs due*
- 1/95 - Responses to WC/T CAD RAIs due*
- 2/95 - RAIs on NOTRUMP/LOFTRAN Code Applicability Documents due to Westinghouse*
- 3/95 - Staff agreement on WCOBRA/TRAC for AP600*
- 4/95 - Responses on NOTRUMP/LOFTRAN Code Applicability Document RAIs*
- 5/95 - Submit Chapter 15 reanalyses*
- 8/95 - DSER input to projects*