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May 8, 1995

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D. C., 20555

ATTENTION: T. R. QUAY

SUBJECT: PROPOSED SCHEDULE AND MILESTONES FOR RESOLUTION OF AP600 PASSIVE SYSTEM RELIABILITY

Dear Mr. Quay:

At the April 20, 1995 passive system reliability meeting, the primary steps to resolve the passive system reliability issue, including the thermal/hydraulic uncertainty evaluation, were agreed upon between Westinghouse and NRC staff. An action item from that meeting was for Westinghouse to provide the detailed milestones and schedule for resolution of the passive system reliability issue. A draft description of the milestones was informally sent to the NRC on May 1. During the May 3, 1995 Westinghouse/NRC AP600 Senior Management Meeting, a sidebar meeting was held to discuss the NRC's comments on the draft description of milestones. Based on the discussion, Westinghouse has updated the description of milestones that represent the resolution path for this issue, including the thermal/hydraulic uncertainty evaluation, to incorporate comments received from the NRC. Westinghouse agreed to issue the updated milestones and the proposed schedule by May 10, 1995.

Enclosed are the agreed upon description of milestones and the proposed schedule for resolving the passive system reliability issue.

Please contact Brian A. McIntyre on (412) 374-4334 if you have any questions concerning this transmittal.

Nicholas J. Liparulo, Manager
Nuclear Safety Regulatory and Licensing Activities

/nja

Enclosures

cc: R. Architzel, NRC
E. Butcher, NRC
A. El-Basioni, NRC
B. A. McIntyre, Westinghouse

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AP600 Thermal/Hydraulic Uncertainty Task and Milestone Descriptions

The planned tasks and milestones are depicted in Figure 1. Each item in Figure 1 is assigned an identifier using the following notation. The first digit identifies the item as either a Task (T) or a milestone (M). The next digit is the task/milestone number, and the last digit denotes responsibility, either Westinghouse (W) or NRC (N).

The following provides a brief definition of each of the tasks. The corresponding milestones are generally transmittals (which may include telephone discussions and/or meetings) of the results of the tasks, and are not described here.

Task 1: Develop Milestone List

The objective of Task 1 is to develop this task list. The list will be submitted to the NRC for review and comment. Once the list is finalized it will provide the means of tracking the progress of the T/H Uncertainty Assessment.

Task 2: Prepare Program Definition and Binning Criteria with Examples

The objective of Task 2 is to document the approach Westinghouse presented on April 20, 1995 to the NRC for addressing T/H uncertainty and to provide a description and an example of the binning process that will be used to reduce the number of sequences that must be examined. The criteria Westinghouse plans to use for binning of sequences and for justifying the bounding sequence selection will be provided to the NRC for review and comment with an example. This will demonstrate how the Westinghouse approach relates to the NRC Margins Approach to resolving the issue of passive system reliability.

Task 3: Complete PRA Appendix A Revision with Baseline Cases

The objective of Task 3 is to incorporate NRC comments into the AP600 MAAP4 analyses for success criteria (Appendix A of PRA revision 2) . Appendix A will be updated to incorporate the formal process Westinghouse presented to the NRC on March 30, 1995 for selection of baseline success criteria. The revised Appendix A will be provided to the NRC for review and comment.

Task 4: Define a Systematic Process for T/H Parameter Identification

The objective of Task 4 is to define a process for the systematic identification of the AP600 plant and MAAP4 code T/H parameters in the MAAP4 analyses. In order to define this process, the PIRT for WCOBRA/TRAC will be reviewed. The selection of the T/H parameters for the MAAP4 analyses will not be as rigorous as the PIRT for the design basis codes, but the review will provide a starting point for defining the process. A preliminary concept for the process involves feedback between the selection of the parameters and bounding values (Tasks 6 and 7) and the MAAP4 benchmarking process with the design basis NOTRUMP analysis (Task 8) for the

cases identified in Task 5. The flowchart in Figure 2 illustrates the preliminary concept. A full description of the process will be provided to the NRC for review and comment.

Task 5: Identify Cases for Benchmarking the T/H Uncertainty Assessment

The objective of Task 5 is to define the cases and the hardware configurations for the NOTRUMP (design basis assumptions) benchmarking cases. MAAP4 analyses with bounding T/H values will be compared to the NOTRUMP cases to demonstrate that the MAAP4 analyses provides a reasonable estimate of the T/H uncertainty (Task 8). It is desirable that the NOTRUMP runs be completed at the beginning of the selection of MAAP4 T/H parameters and their bounding values (Tasks 6 and 7) since the NOTRUMP analyses require a long time to complete, and the results provide a basis for determining the values of the MAAP4 T/H parameters (Task 7). Figure 2 illustrates how Task 5 fits into the process of selecting T/H parameters and bounding values.

- It is anticipated that two cases are required. The first case will examine T/H conditions for sequences in which the RCS pressurizes prior to ADS (small LOCA and transient) and the second case will examine sequences in which the RCS depressurizes prior to ADS (intermediate or medium LOCA).

- The cases will be selected such that they result in success including limited core uncovery.

- The hardware configuration for the benchmark cases will be determined by running MAAP4 analyses with AP600 plant parameters (line resistances, water levels, temperatures, etc.) and decay heat set to bounding values. These values are already known and available in the design basis analyses. The MAAP4 code T/H parameters will not be set to bounding values at this time since they will not yet be defined.

The case definitions for the T/H uncertainty benchmarking will be provided to the NRC at the conclusion of this task for review and comment. Further MAAP4 benchmarking against best-estimate codes will also be performed, but this is not part of the passive systems reliability effort and is not included in this task.

Task 6: Identify T/H Parameters to be Modeled

The objective of Task 6 is to identify the MAAP4 code parameters that will be set to bounding values for the T/H uncertainty analyses. The parameter identification process defined in Task 4 will be implemented to determine the AP600 plant and MAAP4 code parameters.

Task 7: Define Bounding Values for the T/H Uncertainty

The objective of Task 7 is to define the bounding values of the MAAP4 T/H parameters identified in Task 6. Ranges and bounding values of parameters will be determined based on one or more of the following sources:

- the definition and ranges of parameters in the MAAP4 code documentation,
- review of values of similar parameters in the design basis codes (WCOBRA/TRAC and NOTRUMP),
- from ranges of parameters provided by the core and systems designers,
- benchmarking against the NOTRUMP code (Task 8).

Consideration of interactions between parameters will be included in the selection of bounding values. The benchmarking of the cases identified in Task 5 will provide the final justification of the bounding values selected for the MAAP4 T/H parameters. The plant and code T/H parameters and bounding values will be provided to the NRC for review and comment along with the benchmarking (Task 8).

Task 8: Perform MAAP4 T/H Uncertainty Benchmark

The objective of Task 8 is to demonstrate that the MAAP4 code with bounding T/H parameters provides an adequate estimate of the T/H uncertainty. MAAP4 with bounding T/H parameters and NOTRUMP with design basis assumptions will be compared to show reasonable agreement for cases determined in Task 5. Reasonable agreement is defined as producing the same overall conclusions with respect to core uncovery and the success of the sequence (i.e. no core damage). The uncertainty benchmark process will also provide input into the selection of the bounding values of the T/H parameters in Task 7 (see Figure 2). The results of the uncertainty benchmarking will be provided to the NRC for review and comment.

Task 9: Perform and Document Sample T/H Uncertainty Assessment

The objective of Task 9 is to provide a sample assessment to the NRC for review and comment on methodology and documentation. The information developed in the preceding tasks will be used to generate an assessment of the impact of T/H uncertainty for a sample sequence. The methodology will include the following:

- initial sequences will be based on the success criteria baseline cases with conservative hardware assumptions.
- success for the bounding sequences is defined as a peak cladding temperature less than 2200°F; as an objective, extended core uncovery will be avoided for success.

- analyses of sequences with less conservative hardware assumptions will be performed to demonstrate the low probability of failure and extended core uncovery.

Task 9 will test the methodology and illustrate its use in the cases chosen in Task 5 for the MAAP4 uncertainty benchmarking effort. The NRC review will provide comments on the methodology prior to the final analyses of the T/H uncertainties.

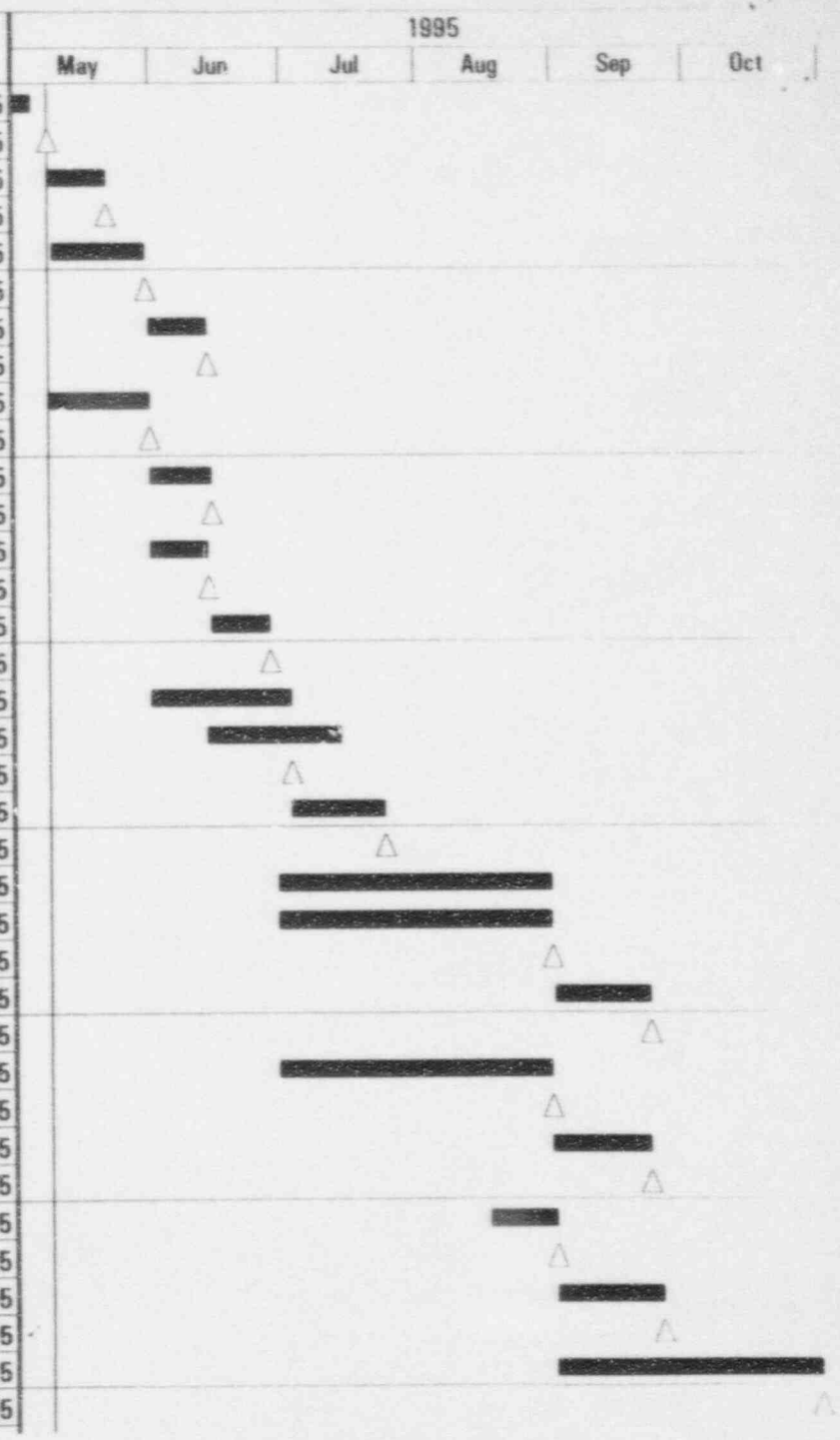
Task 10: Prepare/Document T/H Uncertainty Assessment

The objective of Task 10 is to produce the final T/H Uncertainty Assessment and documentation. Once any major comments are resolved on Task 9, the complete assessment will be performed and documented. If the inclusion of T/H uncertainty requires that system success criteria be modified, any impact on the PRA results will be evaluated and addressed in the documentation. Significant impact on the PRA results will result in a revision of the PRA.

Figure 1

AP600 T/H Uncert. Assessment Schedule

Task ID / Description	Start Date	End Date
T1W: Develop Milestones List	May-01-95	May-05-95
M1W: Provide Milestones to NRC for Revw & Comment	May-09-95	May-09-95
T1N: NRC Rev'w & Comment on Milestones	May-09-95	May-22-95
M1N: NRC Comments on Milestones to W	May-22-95	May-22-95
T2W: Prepare Program Definition & Binning Criteria w/Exemples	May-10-95	May-31-95
M2W: Provide Criteria to NRC for Revw & Comment	May-31-95	May-31-95
T2N: NRC Revw & Comment on Criteria	Jun-01-95	Jun-14-95
M2N: NRC Comments on Criteria to W	Jun-14-95	Jun-14-95
T3W: Complete PRA App A Revision w/ Baseline Cases	May-09-95	Jun-01-95
M3W: Provide Revised App A to NRC for Review	Jun-01-95	Jun-01-95
T3N: NRC Revw & Comment on Baseline Cases	Jun-01-95	Jun-15-95
M3N: NRC Comments on Baseline Cases to W	Jun-15-95	Jun-15-95
T4W: Define Systematic Process for T/H Parameter Selection	Jun-01-95	Jun-14-95
M4W: Provide Process to NRC for Revw & Comment	Jun-14-95	Jun-14-95
T4N: NRC Revw & Comment on Process	Jun-15-95	Jun-28-95
M4N: NRC Comments on Process to W	Jun-28-95	Jun-28-95
T5W: Identify Set of Cases for MAAP4 T/H Uncert. Benchmark	Jun-01-95	Jul-03-95
T5Wa: Perform NOTRUMP Analyses for T/H Uncert. Benchmarks	Jun-14-95	Jul-14-95
M5W: Identify Benchmark Cases to NRC for Revw & Comment	Jul-03-95	Jul-03-95
T5N: NRC Revw & Comment on Case Selection	Jul-03-95	Jul-24-95
M5N: NRC Comments on Cases Selection to W	Jul-24-95	Jul-24-95
T6W: Define T/H Parameters to be Modeled	Jun-30-95	Aug-31-95
T7W: Define Bounding Values for T/H Parameters	Jun-30-95	Aug-31-95
M6/7W: Provide Parameters List, Values to NRC for Revw	Aug-31-95	Aug-31-95
T6/7N: NRC Revw of Parameters & Values	Sep-01-95	Sep-22-95
M6/7N: NRC Comments on Parameters, Values to W	Sep-22-95	Sep-22-95
T8W: Perform MAAP4 T/H Uncert. Benchmark Case	Jun-30-95	Aug-31-95
M8W: Provide T/H Uncert. Benchmark Results to NRC	Aug-31-95	Aug-31-95
T8N: NRC Prelim Revw of T/H Benchmark Results	Aug-31-95	Sep-22-95
M8N: NRC Comments on MAAP T/H Benchmark to W	Sep-22-95	Sep-22-95
T9W: Perform & Document Sample T/H Uncert. Assessment	Aug-17-95	Sep-01-95
M9W: Provide Sample T/H Uncert Assess Results to NRC	Sep-01-95	Sep-01-95
T9N: NRC Revw of Sample Assessment	Sep-01-95	Sep-25-95
M9N: NRC Comments on Sample T/H Uncert Assessment	Sep-25-95	Sep-25-95
T10W: Prepare/Document T/H Uncert Assessment	Sep-01-95	Oct-31-95
M10W: Submit T/H Uncertainty Report to NRC	Oct-31-95	Oct-31-95



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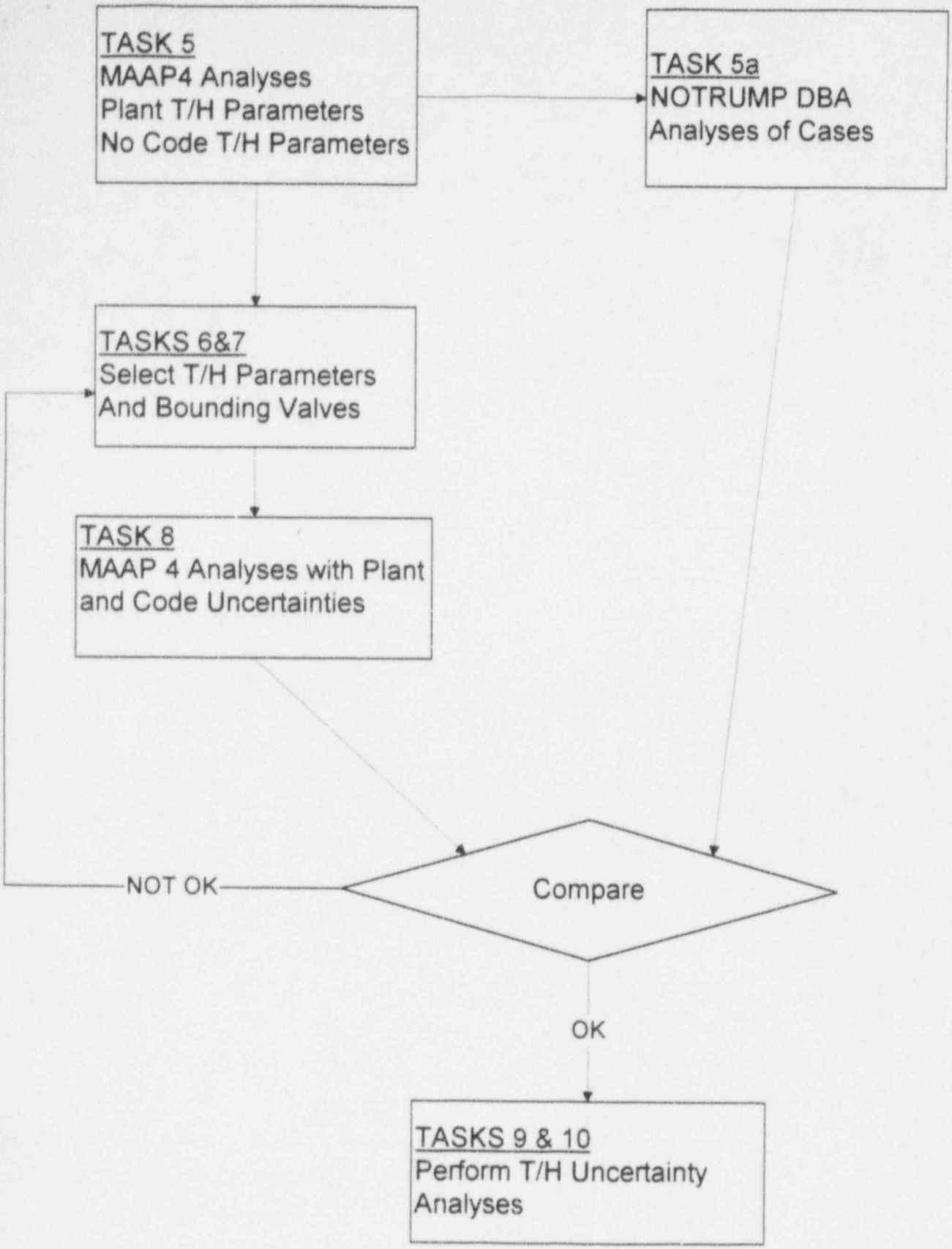

Figure 2
Preliminary Concept Of T/H Parameter Selection
and
MAAP4 Code Benchmarking