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U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

ATTENTION: T. R. QUAY

SUBJECT: WESTINGHOUSE AP600 TECHNICAL SPECIFICATIONS APPROACH

Reference: Letter, T. R. Quay to N. J. Liparulo, "Westinghouse AP600 Technical Specifications, Revision 2, dated July 7, 1995.

Dear Mr. Quay:

During a conference call on March 4, 1996, Westinghouse and the NRC staff discussed several issues within the referenced letter relating to the development plans for the AP600 Technical Specifications. The following paragraphs respond to the referenced letter, and document the Westinghouse approach to completing the AP600 Technical Specifications. These items were discussed in detail during the April 19, 1996 meeting with the NRC staff to support submitting the AP600 Technical Specifications (SSAR Chapter 16.1) by July 5, 1996.

1. Revision to Limiting Condition for Operation (LCO) 3.0.3

The NRC staff recommendation in SECY-94-084 requested that the commission approve the proposed temperature of 420°F or below as a safe stable condition which the passive decay heat removal system must be capable of achieving and maintaining following non-LOCA events, rather than the cold shutdown condition required by Reg. Guide 1.139. In the staff requirements memorandum for SECY-94-084, item C (Safe Shutdown Requirements) states, "The Commission (with all Commissioners agreeing) has approved the staff's recommendation on this item." Given this, the end state for LCO 3.0.3 within the AP600 Technical Specifications will be MODE 4, Safe Shutdown. The plant will be placed in MODE 5 only for conditions which require a cold primary plant, or in situations in which the plant is already in MODE 5 or MODE 6.

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While the SECY addresses safe shutdown requirements on a post-accident basis, the NRC staff has requested justification for specifying MODE 4 in LCO 3.0.3. This justification will be based on the technical merits of the AP600 design, systems operations, and PRA insights. The justification will include discussion regarding current plant experience and applicable regulations and SECYs. Rather than provide this justification with this Technical Specifications' Approach Paper, a separate letter will be provided by the end of May.

2. Criteria to Optimize Completion Times and Surveillance Frequencies

This document presents information related to the criteria used to optimize the completion times and surveillance frequencies within the Technical Specifications. These criteria are based upon the following:

- Completion times and surveillance frequencies based on Standard Technical Specifications
- Reasonable repair requirements based upon plant operating experience
- Plant performance versus equipment availability (DBA and PRA)
- PRA insights (Level 1, Level 2, and system importance rankings)

These aspects will be used to select from a limited set of times to provide for standardization within the Technical Specifications. This process is described in detail in Attachment 1. As can be seen in the details of Attachment 1, not all of the four criteria require application to each AP600 Technical Specification completion time or surveillance frequency. Where a change is not being made to the guidance provided within NUREG 1431, or where the AP600 equipment has no precedence within NUREG 1431, evaluations against the fourth criterion are not being performed.

3. Use of PRA in Technical Specifications

Westinghouse will provide the response to Request for Additional Information (RAI) number 630.10 which requests a list of proposed AP600 Technical Specification requirements that deviated from NUREG-1431 based totally or partially on PRA or PRA insights. The final list will be completed when the Technical Specifications are completed in July 1996.

4. Low Power and Shutdown Operation Technical Specifications

Westinghouse will include AP600 Low Power and Shutdown Technical Specifications within the July 1996 submittal of the Technical Specifications.

5. Compliance with Standard Technical Specifications (STS)

Westinghouse is committed to basing the AP600 Technical Specifications on the content and format of the STS. Deviations will be due to design differences between the AP600 and those plants covered by the STS. Deviations from NUREG 1431 will be justified with the final submittal. A noteworthy point is that the AP600 Technical Specifications will provide the setpoints assumed in the safety analyses. These values will be bracketed and footnoted to indicate that these values must be replaced by the COL applicant with nominal setpoint values following completion of the plant-specific setpoint study.

This letter completes the Westinghouse commitment to provide the NRC with an AP600 Technical Specifications approach letter.

Westinghouse requests the NRC to review this information along with the material discussed at the April 19, 1996 meeting and provide us with timely feedback. This will allow us to effectively achieve AP600 Design Certification by ensuring that the Westinghouse July 5, 1996 Technical Specification submittal meets the NRC needs.

If you have any questions regarding this submittal, please contact Brian McIntyre on (412) 374-4334.

Brian A. McIntyre, Manager
Advanced Plant Safety and Licensing

/nja

Attachment

cc: W. Huffman, NRC
C. Grimes, NRC
N. Liparulo, Westinghouse (w/o attachment)

ATTACHMENT 1
Westinghouse AP600 Technical Specification Optimization Methodology

The Westinghouse Standard Technical Specifications (STS) contained within NUREG 1431 were used as a starting point for the development of the AP600 Technical Specifications (TS). The criteria contained within the "Final Policy Statement on Technical Specification Improvements for Nuclear Power Reactors," July 1993, were used to determine the additions and deletions necessary to account for differences between the "standard" and the AP600 designs. Additional changes were necessary for STS retained for the AP600 TS when a design difference was evident. These changes were made within Revision 1 of the AP600 TS.

The AP600 Draft TS were reviewed to provide a standardization of the duration required for both the completion times within the equipment inoperable conditions and the surveillance frequencies. The completion time review used two criteria: one based on thermal-hydraulic analysis and the other on industry recommended repair time analysis. The surveillance frequency review focused on the ability to monitor a parameter and the likelihood of a un-noticed change. Specific criteria were developed for both the completion time thermal-hydraulic analysis review and the surveillance frequency review.

Completion Time Criteria - Equipment Malfunction

The two review criteria for this area were developed in a series format, meaning that one was completed before the other. The AP600 TS were provided to a group of industry representatives solely to provide an estimate of the repair times for each individual condition. This required the use of judgment due to the uncertainty of the specific cause of the failure, condition of the plant, and plant staffing at the time of failure discovery. However, approximate repair and plant maneuvering times were provided in each case. These industry-recommended repair times were used as input during establishment of the optimized completion times.

The thermal-hydraulic criteria completion time logic shown in Figure 1 was used to establish a standardized time based on thermal-hydraulic criteria. The times within the thermal-hydraulic criteria were selected based upon the precedents established within the STS (or example, the ability to mitigate all DBA based on conservative analysis with no additional single failure results in an allowable time of 72 hours). This completion time is consistent with the situation and time of 72 hours for unavailability of 1 of 2 ECCS pumps within the STS. This anchor point provides the anticipated completion time. The other times within Figure 1 have longer or shorter allowable times based upon their increased or decreased level of conservatism.

Using Figure 1 for each condition requiring recognition within the TS, the answers to the series of junction questions was determined. By following the completion time logic from left to right and answering each question in turn, one of the completion times is selected. This thermal-hydraulic criteria completion time was compared to the industry-recommended repair time. If the industry-recommended repair time was longer, the next longer standard completion time was considered. If justified by a PRA evaluation, that longer completion time was selected. A standard completion time is determined for each condition requiring recognition in the AP600 TS, the next longer standard completion time was considered.

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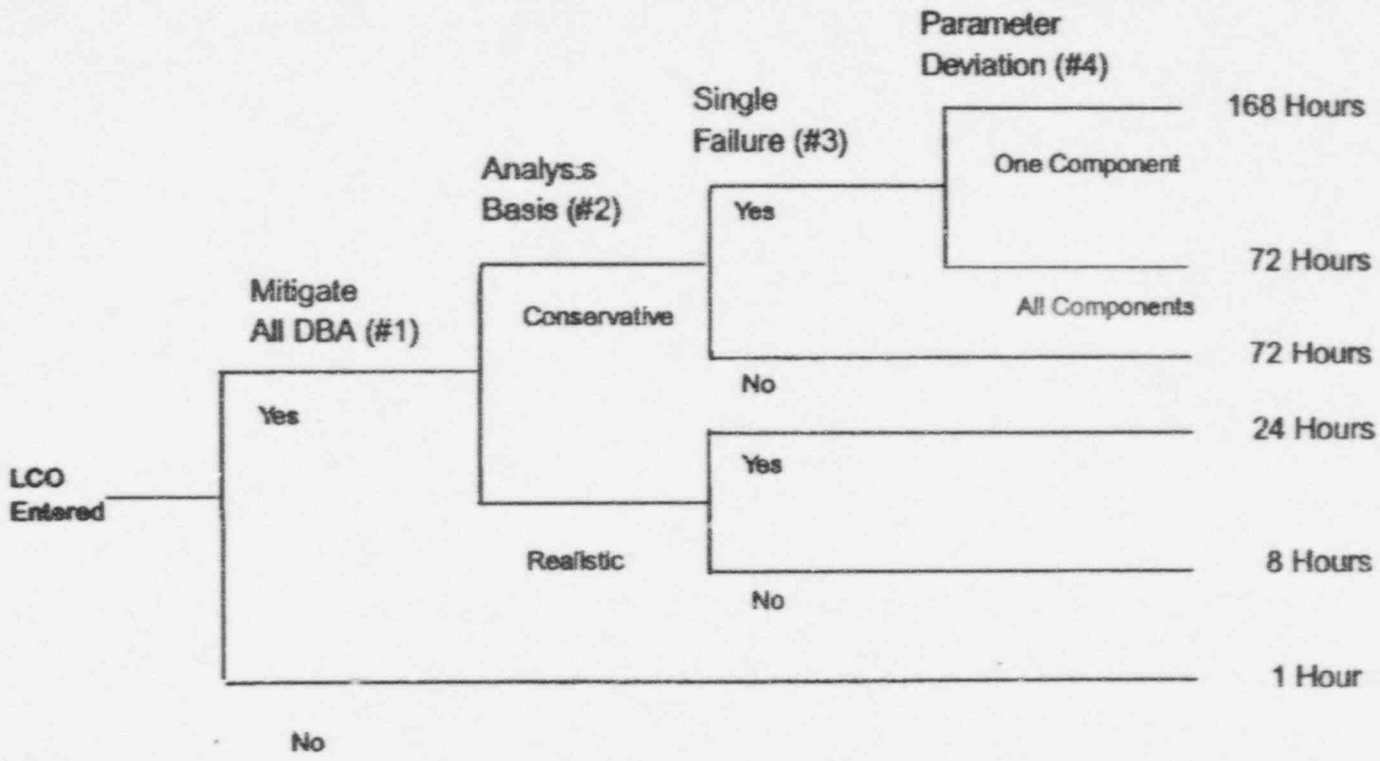

Figure 1 — Completion Time Logic

Note #1: Can plant mitigate all Design Basis Accidents with either conservative or realistic ananlyis?

Note #2: Does the analysis basis utilize conservative (SSAR) or realistic (PRA) analysis assumptions?

Note #3: Can the design sustain an additional single failure and remain able to mitigate all DBA?

Note #4: Is this a parameter deviation and does it affect one redundant component? If not a redundant component, select 72 hours. If only one redundant component affected, select 168 hours. If not a parameter deviation, then select 168 hours.

Completion Times - Plant Manipulation

In this area, a set of guidelines was used that describe which of the major safety equipment are necessary in different modes of plant operations. The requirement provided was to place the plant in a condition that did not require the inoperable equipment to be available. This guidance can be found in Table 1.

TABLE 1
Safety Equipment Availability Needs

MODE	ADS	CMT	PRHR	IRWST	Contain.	PCS
MODE 1-4 (note 1) Full Power	10 of 10 paths Operable	2 Tanks Operable	Heat Exchanger Operable	2 Injection Paths; 2 Cont. Recirc Paths Operable	Integrity	2 Water Flow Paths Operable
MODE 5 RCS Pressure Boundary Closed	9 of 10 paths Operable	1 Tank Operable	Heat Exchanger Operable	1 Injection Path; 1 Cont. Recirc Path Operable	None	None
MODE 5 RCS Pressure Boundary Open	Stages 1, 2, and 3 Open	None	None	1 Injection Path; 1 Cont. Recirc Path Operable	Closure Capability	2 Water Flow Paths Operable
MODE 5 RCS pressure boundary Open, Reduced RCS Inventory	Stages 1, 2, and 3 Open	None	None	1 Injection Path; 1 Cont. Recirc Path Operable	Closure Capability	2 Water Flow Paths Operable
MODE 6 Reactor Internals in Place, Cavity Not Full	Stages 1, 2, and 3 Open	None	None	1 Injection Path; 1 Cont. Recirc Path Operable	Closure Capability	2 Water Flow Paths Operable
MODE 6 Reactor Internals Removed,Cavity Full	None	None	None	None	None	None

Note (1): Both accumulators required in MODES 1-3, above 1000 psig. Accumulators are not required in Mode 3 below 1000 psig nor in MODES 4-6

In addition to this plant condition requirement, specific power and MODE change times were also utilized. These times assume that the unit is at 100% power when the manipulations are required. All times would be from that point to the end point. These can be found within Table 2.

TABLE 2
Plant Maneuvering Times

PLANT CONDITION	ALLOWABLE TIMES
100% to up to 50% Rated Power	4 Hours
MODE 2	8 Hours
MODE 3	8 Hours
MODE 4	24 Hours

Surveillance Frequency Criteria

The times within the Surveillance Frequency Criteria were selected based upon precedents established in the STS. For example, the sampling of accumulator boron concentration every 31 days was established as a baseline. Accumulators must be sampled by obtaining a liquid sample locally. Further, there is effective indirect instrumentation that detects water level changes. Level changes are required to cause a boron concentration change. Finally, this is a parameter that has an established baseline chance of changing rapidly due to previously established STS times. Figure 2 presents a graphical representation of this logic.

With this reference point, the other end points within Figure 2, with the exception of the Main Control Room (MCR) measurable parameters, were given longer or shorter allowable times based upon their increased or decreased level of severity by comparison. The MCR surveillance frequencies were established as every 24 hours, due to their ease of measurement and the fact that the acquisition of the data provided no risk of affecting or changing the parameter. The surveillance requirements for the AP600 were determined by utilizing the surveillance frequency criteria shown in Figure 2. This figure is used to determine the appropriate standard time for each specific surveillance and results in standardization times for TS surveillance activities.

Surveillance frequency requirements for inservice testing activities use the methodology contained within the STS. This requires identification of the equipment and system testing to be performed within the AP600 TS. The details of the testing activities and frequency are then contained within the ASME Section XI Test Program Documentation.

Exceptions to Figure 2 surveillance time standards would be allowed on a case-by-case basis. This was necessary for activities within the electrical sections due to IEEE standard surveillance requirements.

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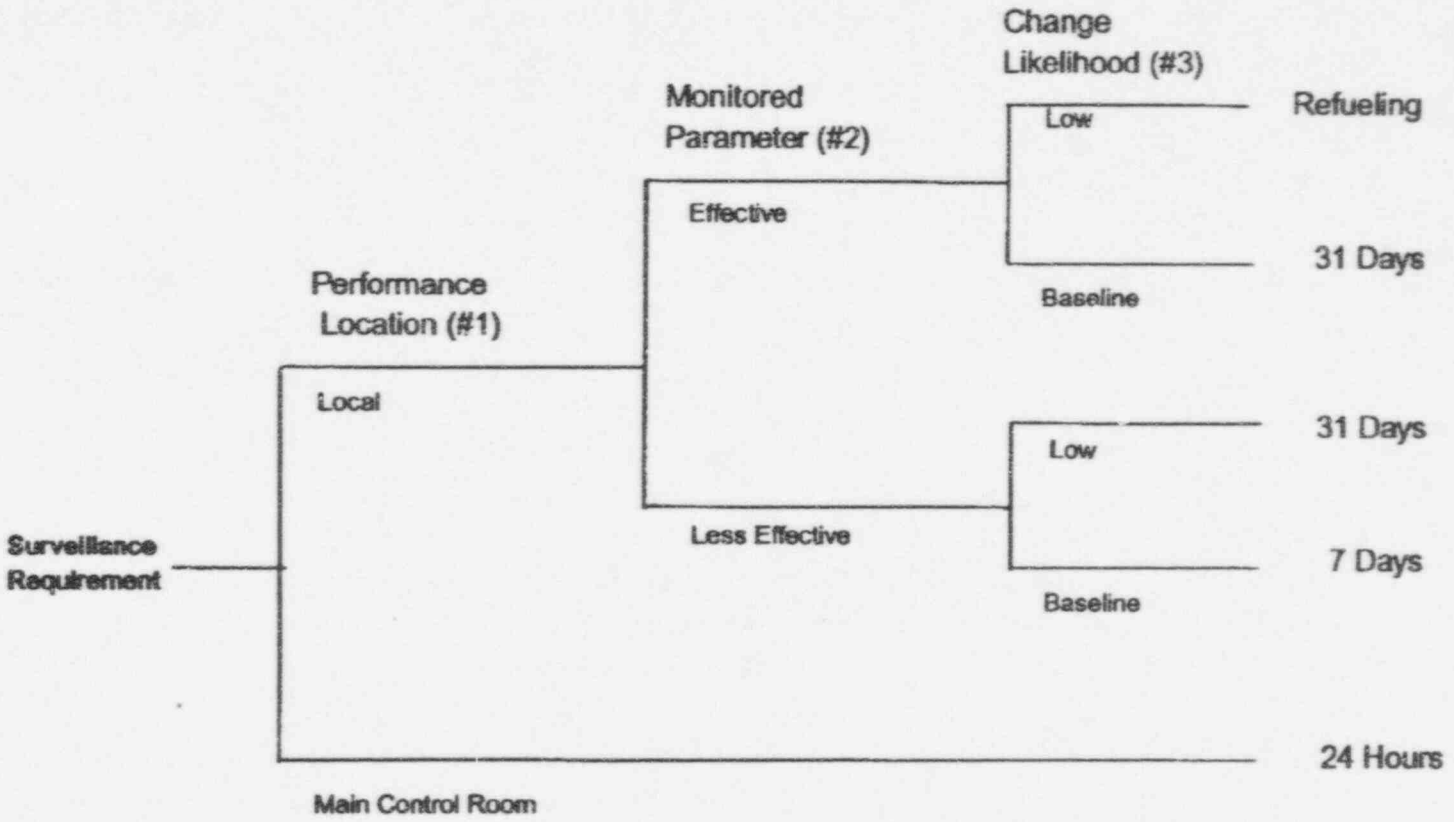

Figure 2 — Surveillance Frequency Logic

Note #1: Is the surveillance performance based upon direct parameter measurement instrument readout within the Main Control Room (MCR) or does it require special activities or local activities?

Note #2: Is the sureveillance activity monitored by a MCR parameter that is effective or less effective at detecting a change in the parameter of interest?

Note #3: Does the parameter have a low or more baseline probability of changing rapidly?

Probabilistic Risk Assessment - AP600 Baseline

Once the process of determining completion times and surveillance frequencies was completed, the selected times for specifications within the AP600 TS were compared to the equivalent TS times within the STS. Where no equivalent existed, no comparison was made since the purpose of the comparison was to determine where a change to the STS was being made and thus would require additional justification. A list (see response to RAI 630.10) was developed showing the STS completion times and surveillance frequencies as well as the proposed AP600 numbers. These differences served as the basis for the necessary PRA evaluations.

These completion times and surveillance frequencies are being incorporated into either the AP600 Baseline PRA for Core Damage (Level 1) and Large Release Frequencies (Level 2), or into PRA evaluations. The method of incorporation was different for the completion times and the surveillance frequencies due to the modeling methodology utilized within PRA.

The surveillance times are a direct input into the PRA mission time of the safety-related equipment. The mission time is the period between demonstrations that the particular function is working or OPERABLE. The purpose of a Surveillance test is to demonstrate just that, that the equipment is functioning properly. Any AP600-proposed change to the time interval of surveillance performance would have a direct impact on the mission time of the particular component. Therefore, changes within the AP600 TS with regard to surveillance frequencies are directly reflected within the AP600 Baseline PRA.

The issue of incorporation of completion times is a more complex item. The completion times allowed within the TS are only partially responsible for its input parameter within the PRA, namely, maintenance unavailability. Maintenance unavailability is a measure of the time that a particular component may not be able to perform its function for various reasons. The equipment may have been removed from service due to equipment malfunction, TS issues, or component malfunction, among others. For this reason, the modification of this historical failure rate is not direct.

For the purposes of evaluating the AP600 TS, the differences from the STS required times have been incorporated into the AP600 PRA and other evaluations. The appropriate and necessary adjustments to the Baseline PRA will be completed to account for any increases due to changes to the Completion Times and Surveillance Frequencies. Some discussion regarding this selection criteria will be provided in the TS bases. In addition, the PRA Final Report will provide some discussion regarding how the TS completion times are addressed by the PRA.

The criteria for a satisfactory PRA quantification following the modifications is defined as:

> The results of the AP600 Baseline and Focused Level 1 and Level 2 PRA meet the NRC Commission goals for core damage and large release frequency.

Probabilistic Risk Assessment - AP600 Importance Rankings

Finally, the completion time changes to the STS for the AP600 are segregated into groups for further evaluation. In each case, the equipment affected by the proposed change is identified and listed. The components/system are then grouped according to the selected completion time. Each component has an importance ranking (high-medium-low) listed beside the completion time according to the results of the AP600 Baseline PRA. Of two possible components, this ranking of the requested changes will be applied only to a single component out of service. This ranking was not performed when the action time involved both components out of service. This is done to avoid skewing the evaluation since the importance number for a component would be the same for any component type. However, the loss of redundant components is clearly worse than the loss of a single component and should, therefore, receive a shorter time.

The objective of this evaluation is to determine any optimized completion time that appears to be of higher significance by comparison to the other items appearing within the same ranking. This will aid in identifying times that may need reconsideration involving a re-evaluation of the industry-recommended repair time criteria, the thermal-hydraulic criteria and the results provided as a function of the Baseline PRA evaluation. When determined to be appropriate, an individual proposed completion time may be adjusted to another importance ranking group following this evaluation.