

April 1, 1996

FOR: The Commissioners  
 FROM: James M. Taylor /s/  
 Executive Director for Operations  
 SUBJECT: STATUS OF THE STAFF'S REVIEW OF ADVANCED REACTOR DESIGNS

- PURPOSE:
- BACKGROUND AND DISCUSSION:
  - MHTGR
  - SBWR
  - AP600
- COORDINATION:
- CONCLUSIONS:
  - MHTGR:
  - SBWR:
  - AP600
- NOTE:

#### **PURPOSE:**

To provide the Commission with the status of the staff's review of the advanced reactor designs, including the AP600, Simplified Boiling Water Reactor (SBWR), and the Modular High-Temperature Gas-Cooled Reactor (MHTGR).

#### **BACKGROUND AND DISCUSSION:**

In its various staff requirements memoranda (SRM), the Commission directed the staff to inform it of changes to the schedules for the review of advanced reactor designs. The staff is continuing work on two advanced designs: the SBWR and AP600. As discussed below, the staff intends to discontinue work on the MHTGR.

#### **MHTGR**

The staff discussed its proposed schedule for the MHTGR in SECY-92-393, "Updated Plans and Schedules for the Preapplication Reviews of the Advanced Reactor (MHTGR, PRISM, and PIUS) and CANDU 3 Designs," dated November 23, 1992. In SECY-95-299, "Issuance of the Draft of the Final Preapplication Safety Evaluation Report (PSEER) for the Modular High-Temperature Gas-Cooled Reactor (MHTGR)," dated December 19, 1995, the staff provided the Commission with a draft of the PSEER for the MHTGR. In its SRM dated February 13, 1996, the Commission approved sending the MHTGR PSEER to the Advisory Committee on Reactor Safeguards (ACRS) and the U.S. Department of Energy (DOE) for their comments, and placing the PSEER in the Public Document Room. On February 26, 1996, the staff sent the PSEER to DOE and requested DOE to provide its comments on the technical discussions and conclusions in the PSEER. In a letter dated March 12, 1996, DOE stated that in the FY-96 budget, Congress had eliminated funding of the departments's gas-cooled reactor program. DOE suggested that the NRC review be discontinued. Consequently, the staff intends to terminate all actions associated with the MHTGR review, including an ACRS meeting scheduled for mid-May, and to archive the MHTGR files unless General Atomics, the MHTGR vendor, advises the staff of its intentions to pursue further staff review.

#### **SBWR**

In SECY-94-117, "Revised Review Schedules for the Design Certification Applications," dated April 29, 1994, the staff submitted its estimated schedule for completing the SBWR review. As a result of comments received on the schedule proposed in that Commission paper, the staff met with representatives from GE Nuclear Energy (GE) and the U. S. Department of Energy. Based on these discussions, as described in a memorandum to the Commission dated July 14, 1994, the staff discussed the restructuring of the review process proposed by GE to focus on testing and analytical code issues related to the SBWR.

In a letter dated March 4, 1996, GE indicated it was redirecting the focus of its SBWR programs from plants of the 670 Mwe size to plants of 1,000 Mwe or larger. In line with redirecting the SBWR focus, GE asked the NRC to review the orderly closure of open NRC activities for the 670 Mwe SBWR. Following receipt of the March 4, 1996, letter, the staff met with GE and conducted a number of conference calls to better understand GE's desired closure objectives, the products GE wished to receive from the NRC closure activities, and the proposed schedule. Further clarification of the GE closure request was received in a letter dated March 13, 1996. In this letter, GE indicated that it would be substantially reducing the level of activity on the TRACG code. This letter also specified the manner in which GE wanted the TRACG activities concluded. While GE has provided their overall objectives for closure of the SBWR activities, the staff is continuing a dialog with GE to determine what it can accomplish within the scope of activities GE intends to support. Further discussions and information is needed from GE to establish a schedule for closeout of the SBWR activities. Note that the only work going on prior to receiving the two March 1996 letters dealt with testing and code development.

#### **AP600**

In SECY-94-117, "Revised Review Schedules for the Design Certification Applications," dated April 29, 1994, the staff submitted its estimated schedule for completing the AP600 review. Based on comments received on the schedule proposed in that Commission paper, the staff met with representatives from the Westinghouse Electric Corporation (Westinghouse), the Nuclear Energy Institute, the U.S. Department of Energy, and the Advanced Reactor Corporation.

As a result of these discussions, as described in a memorandum to the Commission dated July 14, 1994, the staff presented an expedited review schedule for the AP600 that was described as "an optimistic schedule with no margin that can be met only if the staff receives high quality responses that address its concerns and review needs sufficiently in time to support the schedule." The staff worked to that expedited schedule until mid-1995.

Because of extensive review associated with the unique design features and delays in submittal of information by Westinghouse, the staff identified the need to revise the review schedule for the AP600 design during an August 24,

1995, senior management meeting with Westinghouse. During the fall of 1995, the staff and Westinghouse had several scheduling meetings and discussions to ensure that the staff fully understood Westinghouse's schedules for submitting information necessary to support the staff's review. During these discussions, Westinghouse indicated that it wished to decelerate the review in certain areas to accommodate available Westinghouse resources.

In its memorandum to the Commission dated November 28, 1995, the staff informed the Commission that the Westinghouse resources available to support the expected review fees were inconsistent with the review effort estimated by the staff, and that the final safety evaluation report (FSER) could not be prepared on the schedule provided in the July 14, 1994, memorandum to the Commission. Westinghouse asked the staff to continue the full review in a limited number of areas, especially those related to testing and code development. The staff complied with Westinghouse's request. The staff also noted that higher priority operating reactor work could result in the original reviewers being unavailable to perform the AP600 review when it resumed the review. In a letter dated November 13, 1995, Westinghouse elected to prioritize the work it wanted performed by the staff and indicated specific areas on which it would like the near-term staff certification review effort to focus. Accordingly, the staff focused its review efforts on the specific technical areas of the AP600 design requested by Westinghouse and reduced its review efforts in other technical areas that were not referenced in Westinghouse's November 13, 1995, letter. The staff began to formally document the status of its safety review of those technical areas that were not referenced in the Westinghouse letter using documentation, submittals, and related application materials that had already been supplied by Westinghouse. The staff then began reassigning resources that had previously been dedicated to the AP600 to other review tasks within the Office of Nuclear Reactor Regulation.

In a February 2, 1996, letter, Westinghouse stated that, now that their budget was in place, it wanted to work toward achieving the following schedular goals:

Supplement to the DSER (Codes and Testing)	- April 30, 1996
Advanced FSER (to Commission/ACRS/Westinghouse)	- December 20, 1996
Final Design Approval	- April 1997

As a result of this request, the staff met with Westinghouse to discuss the schedule for completing the AP600 review. [Attachment 1](#) discusses the results of the recent scheduling meetings with Westinghouse, assumptions used in developing the revised schedule, and the staff's estimation for completing the review.

Note that as a result of its continuing review effort, the staff has identified several potential new policy and key technical issues. In accordance with Commission guidance, the staff will be developing a separate policy paper discussing these issues. The staff expects to forward a paper discussing these issues to the Commission by May 31, 1996.

#### **COORDINATION:**

The staff considered the scheduler templates requested by the Office of General Counsel and the Advisory Committee on Reactor Safeguards while developing the schedule for the AP600 review.

#### **CONCLUSIONS:**

##### **MHTGR:**

The staff intends to terminate all MHTGR efforts as requested by DOE unless General Atomics advises the staff of its intentions to fund further review.

##### **SBWR:**

The staff expects to substantially reduce the level of activity on the SBWR, including review of the TRACG code. The staff is continuing a dialog with GE to determine what it can accomplish within the scope of activities GE intends to fund. Because of GE's announcement regarding the SBWR, the staff will work with GE on the closeout of the SBWR activities. The TRACG code effort will now be considered as a topical report review and staff efforts on this code will be consistent with the priorities assigned to this and other topical reports submitted by other vendors. The reduction in the level of effort associated with the SBWR will free some staff resources for other high priority work, including the AP600 review effort.

#### **AP600**

After a February 23, 1996, senior management meeting with Westinghouse, the staff agreed to resume, on a full-scale, its review of the AP600. However, recommencing some of the review activities that were curtailed in late 1995 depends on the availability of technical staff who are knowledgeable of the unique aspects of the design. Review staff who have begun work on other higher priority tasks (mostly dealing with operating reactor issues) will complete those efforts before resuming the AP600 review. If experienced personnel are not available in a reasonable time to support the review, staff members not acquainted with the design may be assigned to the review. If so, they will have to be trained on the unique design.

[Attachment 2](#) gives approximate dates or time periods for the key milestones that must be completed to finish the AP600 design certification review. The following projected target dates for the AP600 design certification review are based on optimistic estimates of meeting those milestones:

	<b>Westinghouse Proposal</b>	<b>Staff Target</b>
Supplement to the DSER (Codes and Testing)	April 1996	April 1996
Advanced FSER (to Commission/ACRS/Westinghouse)	December 1996	April 1997
Final Design Approval	April 1997	August 1997

The reviews can be completed within the optimistic estimated staff target periods only if Westinghouse submits timely, high-quality information in the standard safety analyses reports (SSARs), the inspections, tests, analyses, and acceptance criteria (ITAAC) documents, and other supporting documentation, and if the analyses of test results demonstrate the adequacy of Westinghouse's designs. The schedule is also considered at risk if Westinghouse deviates significantly from resolutions reached on applicable issues during the evolutionary reviews, or if the resolution of any new policy issues that may be identified is protracted.

Meanwhile, the staff will continue to develop an overall review schedule for the design certification of the AP600, and expects to establish a firm completion date after the supplement to the DSER is issued and certain policy issues have been addressed. The staff will then be better able to determine how much effort will be needed to complete the review.

In the meantime, the staff will use the dates shown above as interim target dates until the review of key technical issues has progressed sufficiently to provide the staff with a clearer understanding of the remaining technical issues and how long it will take to resolve them. The staff will then issue a revised schedule, with firm dates for completing the review.

The staff intends to make this paper publicly available within 3 workdays from the date of this paper.

**NOTE:**

Copies of this paper will be submitted to the appropriate congressional committees. Copies will also be submitted simultaneously to the U.S. Department of Energy.

James M. Taylor  
Executive Director for Operations

CONTACT: Thomas J. Kenyon, NRR  
415-1120

Attachments: 1. [Schedule Assumptions for the Review of the AP600](#)  
2. [Key Milestones for Completing the AP600 Review](#)

ATTACHMENT 1

## SCHEDULE ASSUMPTIONS FOR THE REVIEW OF THE AP600

- [BACKGROUND](#)
- [DISCUSSION AND KEY ASSUMPTIONS](#)
  - [Staff Availability](#)
  - [Key Issues](#)
  - [Other Open Issues](#)
  - [Review Milestones](#)
  - [Westinghouse Proposed Milestones](#)
- [HEARING SCHEDULE](#)
- [COORDINATION](#)
  - [FACTORS THAT COULD ADVERSELY AFFECT THE SCHEDULES](#)

### BACKGROUND

In its various staff requirements memoranda, the Commission directed the staff to inform it of changes to the schedules for the review of evolutionary and advanced reactor designs. In SECY-94-117, "Revised Review Schedules for the Design Certification Applications," April 29, 1994, the staff submitted its estimated schedules for completing these reviews. Based on comments received on the schedules proposed in that Commission paper, the staff met with representatives from the Westinghouse Electric Corporation (Westinghouse), the Nuclear Energy Institute, the U. S. Department of Energy, and the Advanced Reactor Corporation to discuss the proposed review schedule for the AP600.

Following these discussions, in a memorandum to the Commission dated July 14, 1994, the staff presented an expedited review schedule for the AP600 that was described as "an optimistic schedule with no margin that can be met only if the staff receives high quality responses that address its concerns and review needs sufficiently in time to support the schedule."

While the staff was developing the July 1994, expedited review schedule for the AP600, Westinghouse committed to expedite its submittal of certain information, including code-related work, and to reduce the time for responding to the open issues identified in the draft safety evaluation report (DSER) on the AP600 design. Westinghouse assumed that there would be no major problems identified in the supplemental DSER on the testing and code effort that would invalidate the final standard safety analysis report (SSAR), the probabilistic risk assessment (PRA), the proposed inspections, tests, analyses, and acceptance criteria (ITAAC), or related issues. Westinghouse expedited the testing program and provided advanced submittals of the testing results. Westinghouse also committed to provide advanced submittals of the Chapter 15 analyses codes.

As a result of these commitments by Westinghouse, the staff agreed to perform early, parallel reviews of certain technical matters. The staff decided to limit the contents of the supplement to the DSER to the acceptability of the testing program and the acceptability and applicability of the analysis codes for evaluating the AP600 design. As stated in the July 14, 1994, memorandum, there was "a potential risk that both the staff and Westinghouse may have to expend additional review effort and time if substantial revisions need to be made later to these submittals."

The staff also reduced the time between certain milestones for developing the final design approval (FDA) and proposed rule. The time required to issue the FDA was also reduced because the related design control document (DCD) no longer needed to be reviewed and approved before the staff issued the FDA, as was assumed in SECY-94-117.

The schedule included assumptions regarding external forces that are not controlled by the staff, such as schedules that needed to be met by Westinghouse and the Advisory Committee on Reactor Safeguards. The staff assumed that significant new policy issues would not be identified and that existing issues (for example, regulatory treatment of non-safety-related systems, ITAAC, or the new source term) could be resolved without significant problems. The July 1994, expedited schedule was also deemed at risk if Westinghouse significantly deviated from the resolutions reached on applicable issues addressed during the reviews of the evolutionary light-water reactors.

In a letter to Westinghouse dated January 20, 1995, the staff noted its concerns that important submittals (such as Revision 2 to the PRA) were being delayed; that meetings to resolve technical issues were becoming difficult to set up because of the unavailability of Westinghouse technical personnel; and that the submittal schedule for key information that was expected to be included in the final test reports on the AP600 test facilities was delayed for several months. The staff stated that without sufficient support for both technical meetings and timely, high-quality submittals, the expedited review schedule would not be attainable.

Although many of the concerns expressed in the January 1995, letter were resolved through more aggressive efforts, problems still persisted in other technical areas. Westinghouse was informed of this continuing concern in an April 24, 1995, letter.

In addition, in January 1995, Westinghouse requested the staff to redirect its WCOBRA/TRAC review to focus on the generic code for operating plants, even though the staff informed Westinghouse that such a change in direction would divert resources from the code review effort on the AP600.

Not only did the delays impact the ability to meet the schedule, the delays had a cascading effect of certain issues on other, related concerns. Because of these delays, the staff identified the need to revise the review schedule for the AP600 design during an August 24, 1995, senior management meeting with Westinghouse. During the fall of 1995, the staff and Westinghouse had several scheduling meetings and discussions to ensure that the staff fully understood Westinghouse's schedules for submitting information necessary to support the staff's review. During these discussions, Westinghouse indicated that it wished to decelerate the review in certain areas to accommodate available Westinghouse resources.

In its memorandum to the Commission dated November 28, 1995, the staff informed the Commission that the Westinghouse resources available to support the expected review fees were inconsistent with the staff's estimated review effort, and that the final safety evaluation report (FSER) could not be prepared on the schedule provided in the July 14, 1994, memorandum to the Commission. Westinghouse asked the staff to continue the full review in a limited number of areas, especially those related to testing and code development. Review of most of the remaining areas was to be decelerated. The staff complied with Westinghouse's request. The staff also noted that higher priority operating reactor work could result in the original reviewers being unavailable to perform the AP600 review when it resumed the review. In a letter dated November 13, 1995, Westinghouse elected to prioritize the work it wanted performed by the staff and indicated specific areas on which it would like the near-term staff certification review effort to focus. Westinghouse stated that its highest priority was obtaining the supplementary DSER on the acceptability of the testing program and the complementary validation and verification of computer codes. Additionally, Westinghouse stated that it wished to continue support in other areas which had the potential for the most impact on design-related activities. These areas included certain regulatory treatment of non-safety-related systems (RTNSS) issues, thermal-hydraulic uncertainty, level 1 probabilistic risk assessment (PRA), post-72-hour actions, and adverse systems interactions. Some severe-accident performance issues, instrumentation and control reviews, and engineered safety feature functional design and performance reviews were also continued. Westinghouse also requested the staff's input on several pilot ITAAC.

Accordingly, the staff focused its review efforts on the specific technical areas of the AP600 design identified by Westinghouse in its November 13, 1995, letter and reduced its review efforts in other areas. Review areas that were significantly curtailed due to lack of submittals or cancelled meetings included instrumentation and controls, leak-before-break, seismic margins, basemat design, auxiliary systems, and the reliability assurance program. Because Westinghouse had not submitted the pilot ITAAC or the technical specifications approach paper during the review hiatus, no work was performed in these areas. These delays in submittals are expected to impact review of the final ITAAC and technical specifications. The staff began an effort to formally document the status of its safety review of these other technical areas using documentation, submittals, and related application materials that had already been supplied by Westinghouse. The staff began reassigning resources that had previously been dedicated to the AP600 to other high priority work.

In a February 2, 1996, letter, Westinghouse stated that, now that their budget was in place, it wanted to work toward achieving the following schedular goals:

Supplement to the DSER (Codes and Testing)  
Advanced FSER (to Commission/ACRS/Westinghouse)  
Final Design Approval

- April 30, 1996  
- December 20, 1996  
- April 1997

## **DISCUSSION AND KEY ASSUMPTIONS**

In determining how quickly the staff can resume review in those areas where the review was curtailed and what review schedule can realistically be met, the staff considered reviewer availability, contractor funding and availability, impact of full resumption of the AP600 review on other reviews, number and complexity of remaining open items, number of intermediate milestones (submittals, number of expected future meetings, additional requests for information, etc.), and the staff's past experience with the reviews of the evolutionary and advanced reactors.

### **Staff Availability**

As a result of a February 23, 1996, senior management meeting with Westinghouse, the staff agreed to resume, on a full-scale, its review of the AP600. However, recommencing some of these activities depends on the availability of technical staff who are knowledgeable of the unique aspects of the design. Since Westinghouse requested the staff to decelerate its review in 1995, some key NRC personnel have been reassigned to higher priority work on operating reactors. It would be inappropriate to reassign these reviewers back to AP600 work prior to completing these other reviews. Therefore, such reassignments will not be made. In addition, federal budget reductions have impacted the staff's ability to fund technical assistance contractors. The staff believes that it will be more efficient to delay the review in affected areas until experienced reviewers are available to resume the review. However, if experienced personnel are not available within a reasonable time to support the review, staff members not acquainted with the design may be assigned to the review. If so, they will have to be trained on the unique aspects of the AP600.

### **Key Issues**

The review of the AP600 involves a number of first-of-a-kind issues that are unique to the design of the passive plants. However, issues that significantly affect the review are (1) the testing and analyses programs that are required to support certification of the design in accordance with 10 CFR 52.47(b)(2), (2) thermal-hydraulic uncertainty with the operation of the safety-related passive systems and its relationship to the regulatory treatment of non-safety-related systems, and (3) policy issues specific to the AP600 review.

### ***Effect of the Testing and Code Analysis Programs on the Review Schedule***

The evaluation of the testing program and the development of the analysis codes by Westinghouse to meet the requirements of 10 CFR 52.47(b)(2) could affect certain aspects of the design. These technical areas are addressed in a significant portion of the SER, including:

- 1.5, "Requirements for Further Technical Information"
- 3.9, "Mechanical Systems and Components"

- 5.4, "Component and Subsystem Design (of the Reactor Coolant System and Connected Systems)"
- 6.2, "Containment Systems"
- 6.3, "Passive Core Cooling Systems"
- 15.0, "Accident Analyses"
- 19.0, "Severe Accident and Probabilistic Risk Assessment (PRA)"

The results of the evaluations could also have profound effects on the rest of the SER if analyses dictate the need for design modifications. Furthermore, the staff believes that the results of the code analyses could have an impact on the assessment of the margins associated with the PRA success criteria and affect the staff's review of the issue of the regulatory treatment of non-safety-related systems.

The staff is developing a supplement to the DSER to discuss the testing that has been performed, the staff's evaluation of the acceptability of the testing program, and the acceptability and applicability of the analysis codes that have been developed by Westinghouse for the AP600 design. The supplement will identify remaining open issues on these matters, so Westinghouse can finalize the AP600 design and determine the best way to resolve remaining issues. Until the design is finalized and clear paths to resolution are identified, the staff believes that it will be difficult to accurately project a realistic review schedule beyond the supplement. A more appropriate time to determine the review schedule would be after issuance of the supplement. The staff intends to issue this supplement in April 1996. The staff and Westinghouse can then better assess how much effort will be needed to complete the review and the impact of the remaining issues on the overall completion schedule.

#### ***Effect of Resolving the Issue of Thermal-Hydraulic Uncertainty with Passive Systems on the Review Schedule***

Resolving the issue of thermal-hydraulic uncertainty with the operation of the safety-related passive systems entails complex PRA methods and deterministic thermal-hydraulic analysis with computer codes. Resolution of this issue could potentially result in modifications in the design or involve the regulatory treatment of non-safety-related systems. Resolution of this issue could affect other key aspects of the review, including development of the technical specifications, ITAAC, and the initial test program. Westinghouse is in the process of finalizing the path to resolution of this complex issue. The staff believes that a realistic review schedule for the AP600 will be difficult to establish until a way of resolving this issue is established.

#### ***Effect of Policy Issues on the Review Schedule***

In accordance with Commission guidance, the staff will develop a separate policy paper discussing one or more policy issue on the AP600. Potential topics include issues concerning equipment necessary to strike an appropriate defense-in-depth balance between prevention and mitigation in advanced reactor design, and sole reliance on in-vessel retention as an accident management strategy for the AP600. Commission review and decision on these and other policy matters has the potential to impact the AP600 schedule. Following Commission guidance on this policy paper, the staff will be in a better position to develop a revised review schedule with firm dates. The staff expects to issue the paper to the Commission by May 31, 1996.

#### **Other Open Issues**

The staff has issued approximately 3000 requests for additional information (RAIs) on the AP600 design; Westinghouse has responded to approximately 2500. In addition, the staff's November 1994 DSER contained over 1100 open items. In its February 2 and March 8, 1996, letters, Westinghouse provided its planned submittal dates for revisions to the AP600 SSAR, PRA, ITAAC, and other key information. Westinghouse has committed to submit most key information by the end of July 1996.

#### **Review Milestones**

The staff expects to perform a sufficiency review of each submittal within about 2 months of the date of receipt to determine whether it contains sufficient information to close out the subject issue. This estimate assumes that the staff can begin its review when Westinghouse submits the documentation. However, the staff may delay its review of AP600 information until it has finished other high priority assignments that it began during the review hiatus requested by Westinghouse. Because many of these submittals are expected to contain significantly revised information or will not have been previously reviewed, the staff believes that RAIs concerning these submittals will probably need to be issued to resolve staff concerns. The staff believes that Westinghouse will likely take at least 2 months to respond to these requests. After the final responses to the RAIs are received, the staff estimates that it can finish its review of the documentation and prepare an FSER input in about 2 months. Using the assumptions of SECY-94-117, the staff believes it can issue the advanced copy of the complete FSER to the Commission and ACRS for final review in about 3 months after all FSER inputs are developed by the review staff. The milestone periods shown in Attachment 2 show the remaining milestone estimates, using the assumptions of SECY-94-117 as modified by the July 1994 expedited schedule.

#### **Westinghouse Proposed Milestones**

During recent scheduling meetings, Westinghouse indicated that it believes that no additional RAIs will result from the staff's sufficiency reviews of the final documentation scheduled to be submitted in July 1996. However, should such questions be raised, Westinghouse believes that it can respond to the RAIs resulting from the sufficiency review within 5 weeks because of the continuous technical discussions that will be taking place between the staff and the vendor. To address this matter, the staff reviewed Westinghouse's response times to approximately 2500 RAIs issued since the submittal of the AP600 application. Figure 1 shows the results of this study. The staff estimates that Westinghouse's average response time to staff questions is approximately 120 days. During the review, the staff also determined that Westinghouse responded to approximately 3 percent of the RAIs in 5 weeks or less. Therefore, the staff believes that Westinghouse's assumption that a 5 week response time on RAIs is unrealistic in a majority of the cases. However, in light of Westinghouse's commitment to expedite its responses, the staff has used an optimistic, but more achievable Westinghouse turnaround time of 2 months in its milestone estimates.

In addition, because of the continuous technical discussions that will be taking place during this period and because of Westinghouse's submission of certain docketed draft information in advance of the final submittals, Westinghouse has asked the staff to strive to shorten the time necessary to complete the sufficiency review. Westinghouse believes that the time to develop the FSER input should be improved because the foundation for the FSER has been established in the DSER. The staff has reviewed its past experience in reviewing the previous advanced light-water reactor (LWR) projects, and has determined that the review times allocated for these milestones are the minimum required to complete these steps (see SECY-94-117). The staff's experience with the reviews of the evolutionary LWRs has shown that issues remaining near the end of the review are more difficult to close, and take more time to reach an acceptable resolution. Although the staff may be able to expedite its review in certain areas because of the status of the review, the review of other technical areas is expected to require a minimum of 2 months for each milestone.

#### **HEARING SCHEDULE**

The time required for the rulemaking hearings is difficult to estimate without previous experience. The staff discussed possible hearing schedules in SECY-92-170, "Rulemaking Procedures for Design Certification," May 8, 1992, and SECY-92-381, "Rulemaking Procedures for Design Certification," November 10, 1992, estimating that a hearing could take from 1 to 2 years to complete. As discussed in the November 23, 1992, Commission meeting with the Office of General Counsel (OGC) on this subject, 18 months is a good estimate of the time to complete the rulemaking hearings.

## COORDINATION

The staff considered the schedule templates requested by OGC and the ACRS while developing these schedules.

## FACTORS THAT COULD ADVERSELY AFFECT THE SCHEDULES

The passive design certification reviews are the first of their kind, for which many of the assumptions are best estimates that have little historical precedent. The staff assumed that all open items will be resolved before the final SSAR, ITAAC, and technical specifications are submitted. The staff's experience with the reviews of the evolutionary LWRs has shown that issues remaining near the end of the review are more difficult to close, and take more time to reach an acceptable resolution. The schedule does not allow any extra time for reviewing the technical specifications, ITAAC, or initial test program, which are expected to be difficult areas of review because of the unusual nature of the AP600 design. In addition, the staff assumed that the certified design material (CDM)/ITAAC and the SSAR information will be sufficiently consistent so that an Independent Review Group (used during the review of the ITAACs for the evolutionary designs) will not be required.

The staff assumed that Westinghouse will develop the final design documentation (e.g., SSAR, CDM/ITAAC, and DCD) for the AP600 consistent with the resolutions of issues addressed on the evolutionary LWRs, such as treatment of the PRA, Tier 2\* information, and secondary references. Deviation from the resolutions developed during the evolutionary LWR reviews (see June 9, 1995, guidance letter) could adversely affect the milestone periods.

The estimated review periods can be achieved only if Westinghouse submits timely, high-quality SSAR, ITAAC, and technical specification information and if the test results and code analyses demonstrate the adequacy of the designs. The staff has assumed that Westinghouse will stagger its submittals in accordance with the February 2 and March 8, 1996, letters. The staff also assumed that it will have the opportunity to review docketed draft information, where appropriate, to expedite the review. The schedule is also considered at risk if Westinghouse deviates significantly from resolutions reached on applicable issues during the evolutionary reviews, or if the resolution of any new policy issues that may be identified is protracted.

Assumptions have been made regarding external forces that are not controlled by the staff (schedules that must be met by Westinghouse and the ACRS).

These aggressive schedules are optimistic and have no margin; therefore, any perturbation could cause them to slip.

ATTACHMENT 2

## REVISED SCHEDULE FOR THE AP600

MILESTONE	SECY-94-117	July 14, 1995 Expedited Schedule	Revised Dates
Requests for Additional Information (RAIs) to Project Manager (PM)	Completed	-	-
<b>RAIs Issued to Applicant</b>	Completed	-	-
Applicant Responds to RAIs	Ongoing	-	-
DSEI to PM	Completed	-	-
<b>DSEI to Comm/ACRS</b>	11/94	-	-
Applicant Responds to DSEI	6/95	-	-
Final Test Report Submitted	5/95	3/95	10/95
DSEI Supplement to PM	9/95	8/95	3/96
<b>DSEI Supplement to Comm/ACRS</b>	11/95	10/95	4/96
Applicant Responds to DSEI Supplement/Submits Code V&V Report	2/96	12/95	8/96
Applicant Submits Final SSAR Revisions & Documentation	-	-	7/96
Staff Performs Sufficiency Review	-	-	1-2 months*
Westinghouse Responds to Remaining Issues	-	-	0-2 months*
FSER to PM	6/96	2/96	1-2 months*
<b>FSER to Comm/ACRS</b>	9/96	5/96	3 months
<b>FSER Issued for Publication</b>	1/97	8/96	3.5 months
<b>FDA/FR Notice Issued</b>	4/97	9/96	1 month
<b>Design Certification Document Submitted</b>	-	-	-
<b>Proposed Rule/FR Notice Issued</b>	5/97	-	-

\* 1st number = Westinghouse estimate/request; 2nd number = NRC minimum estimate