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FOR: The Commissioners

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SUBJECT: EFFECTIVENESS AND EFFICIENCY PLAN FOR POWER UPDATES

PURPOSE:

To provide the Commission an integrated plan for improving the effectiveness and efficiency of power uprate reviews. This paper meets the Commission's direction in Staff Requirements Memorandum (SRM) M020129 dated February 8, 2002.

SUMMARY:

The staff has identified several areas where the effectiveness and efficiency of power uprate application and review processes can be improved and has formulated a plan to achieve these improvements. In formulating the plan, the staff considered its experience with license renewal processes, lessons learned from previous power uprate reviews, and feedback from internal and external stakeholders. The plan will include: (1) enhanced planning and scheduling tools, (2) more effective utilization of resources, (3) enhanced techniques for managing the power uprate program, (4) assessments of past reviews and lessons learned, (5) efforts to further standardize power uprate processes, including an assessment of the scope of the current review methodology, and (6) a communication plan for the power uprate program. In its

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letters on recent power uprate reviews, the Advisory Committee on Reactor Safeguards (ACRS) highlighted certain areas where additional improvements could be made. The staff will consider the ACRS comments as part of the assessment of past reviews and lessons learned to date. The staff will also assess the current baseline review scope for extended power uprates (EPUs). The staff has been actively working on many of the elements of the plan and has targeted completion by the end of calendar year 2002. The effectiveness and efficiency plan is consistent with the Agency's four performance goals of maintaining safety, improving internal effectiveness and efficiency, increasing public confidence, and reducing unnecessary regulatory burden.

#### BACKGROUND:

By an SRM dated May 24, 2001, the Commission directed the staff to assign power uprates a high priority and conduct power uprate reviews in the most effective and efficient manner practical. The Commission also directed the staff to take steps to better understand licensees' intentions for submitting power uprate applications in order to facilitate planning. The Commission further stated that the staff, in consultation with stakeholders, should identify potential areas for improvement in current power uprate processes in order to ensure that the processes do not cause unnecessary delays. In addition, the Commission directed the staff to keep the Commission informed of significant matters related to power uprates, track the status of power uprate activities in the Chairman's Tasking Memorandum (CTM), and promptly inform the Commission of any delays in the staff's power uprate activities.

In SECY-01-0124, dated July 9, 2001, the staff provided the Commission a status of power uprate reviews and the staff's plans for implementing the directions in the May 24, 2001, SRM. The staff has completed many of the initiatives discussed in SECY-01-0124. The staff has (1) launched an internet Web site (<http://www.nrc.gov/reactors/operating/licensing/power-uprates.html>) to provide internal and external stakeholders information related to power uprates, (2) conducted two public workshops (one for MUR power uprates and one for EPUs) to discuss ways to improve power uprate application and review processes, (3) conducted a power uprate session at the NRC's 2002 Regulatory Information Conference to provide information on power uprate programs at the NRC, nuclear steam supply vendors, and domestic and foreign plants, (4) issued Regulatory Issue Summary 2002-03, "Guidance on the Content of Measurement Uncertainty Recapture Power Uprate Applications," dated January 31, 2002, (5) conducted briefings to the ACRS on several EPU reviews, (6) conducted surveys in June 2001 and January 2002 of all operating reactor licensees to obtain information regarding the number, type (i.e., MUR power uprate, stretch power uprate, and EPU), and timing of future power uprate applications, and informed the Commission of the results of these surveys, (7) initiated efforts to develop a review standard for EPUs to increase the standardization and effectiveness of EPU reviews, (8) initiated efforts to monitor, trend timeliness and resource expenditures, and report the progress of power uprate reviews, (9) implemented the use of status reports to track individual power uprate reviews, and (10) kept the Commission informed of the status of power uprate reviews through updates to the CTM and other means (e.g., a memorandum to the Commission dated March 4, 2002).

DISCUSSION:

The staff is continuing its efforts to improve power uprate application and review processes. The staff has identified several areas where the effectiveness and efficiency of power uprate application and review processes can be improved and has formulated a plan to achieve these improvements. In formulating the plan, the staff considered its experience with license renewal processes, lessons learned from previous power uprate reviews, and feedback from internal and external stakeholders. The staff's plan to enhance the effectiveness and efficiency of power uprate processes includes: (1) implementing tools to plan, schedule, and forecast resource needs for power uprate reviews, (2) to the extent possible, relying on the same set of experienced reviewers to perform power uprate reviews, which will promote better communication and coordination among reviewers, provide an experience base more specific to power uprates, and improve the consistency of power uprate reviews, (3) implementing enhanced techniques for monitoring, trending timeliness and resource expenditures, and reporting the progress of individual power uprate reviews and the overall power uprate program, (4) conducting assessments of past reviews, requests for additional information, the Maine Yankee Lessons Learned Task Group Report, internal and external stakeholder feedback, and ACRS letters on past power uprate reviews, (5) completing the development of a review standard for EPU's that will better define the scope and depth of these reviews, and (6) developing a formal communication plan to ensure that the staff's goals and efforts to achieve them are communicated with internal and external stakeholders. The staff will also consider ACRS comments on recent power uprate reviews as part of the assessment of past reviews and lessons learned, and as part of the development of the review standard.

The effectiveness and efficiency plan is consistent with the Agency's four performance goals of maintaining safety, increasing public confidence, improving internal effectiveness and efficiency, and reducing unnecessary regulatory burden. The staff has been actively working on many of the elements of the plan and has targeted completion of them by the end of calendar year 2002. The staff will inform the Commission of any changes to this schedule. The attachment to this paper includes a detailed discussion of each of the elements of the plan. In the FY 2004 - FY 2005 Budget Request, NRR assumed efficiencies in processing licensing actions of 6 percent in FY 2004 and 4 percent in FY 2005. The staff's goal for power uprates is to exceed these efficiency gains. However, achieving this goal will depend on the results of the assessment of power uprate processes and whether the scope and depth of reviews will be changed. In implementing the plan, the staff will ensure that safety remains paramount and quality of the staff's products will continue at a high level. Efficiency will not be achieved at the expense of quality.

RESOURCES:

Resources to develop and implement the effectiveness and efficiency plan discussed in this paper are included in the FY 2002 and FY 2003 budgets. No additional resources will be required.

COORDINATION:

The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objections. The Office of the General Counsel has reviewed this paper and has no legal objection.

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Attachment: Effectiveness and Efficiency Plan  
for Power Upgrades

## EFFECTIVENESS AND EFFICIENCY PLAN FOR POWER UPDATES

### Introduction

By Staff Requirements Memorandum (SRM) M020129 dated February 8, 2002, the staff was directed to provide the Commission with a plan for improving the effectiveness and efficiency of power uprate reviews. The staff has developed such a plan in its continuing efforts to improve power uprate application and review processes.

### Analysis of Historical Data

The first MUR power uprate was approved for Comanche Peak Unit 2 in September 1999. The staff's review of this MUR power uprate application required approximately 0.9 FTE and 9 months to complete. Since completing its review of the Comanche Peak Unit 2 MUR power uprate application, the staff has completed reviews of 10 MUR power uprate applications covering 17 units. The staff analyzed the duration and resource expenditure data for these reviews and determined that on average, the review of MUR power uprate applications require about 0.8 FTE and 8 months to complete.

The staff has been reviewing stretch power uprate applications since the 1970s and has completed reviews of stretch power uprate applications for over 50 units. The review process for stretch power uprates is well established. Reviews of recent stretch power uprate applications have required approximately 1.1 FTE and 9 to 14 months to complete.

The first EPU for a boiling-water reactor (BWR) plant was approved for the Monticello plant in September 1998. The review of this EPU application required approximately 1.9 FTE and 26 months to complete. Soon after the Monticello EPU license amendment was issued, the staff issued an EPU for Hatch Units 1 and 2 in October 1998. The review for the Hatch EPU application required approximately 2.1 FTE and 14 months to complete. More recently, the staff has completed the review of first-of-a-kind EPU applications for much higher increases in power for Duane Arnold, Dresden Units 2 and 3, Quad Cities Units 1 and 2, Clinton, and Brunswick Units 1 and 2. The reviews of these EPU applications required approximately 2.2 FTE and were completed within 12 months. Over time, the duration of reviews for BWR EPU applications has been reduced by more than 50 percent by increasing the number of technical review staff and management involved in these high priority licensing actions.

The first EPU for a pressurized-water reactor plant was approved for Arkansas Nuclear One Unit 2 in April 2002. The staff's review of this EPU application required approximately 3.2 FTE and 16 months to complete.

### Plan for Further Improvement

The staff has completed several initiatives to improve power uprate processes consistent with the Agency's four performance goals (i.e., maintaining safety, increasing public confidence, improving internal effectiveness and efficiency, and reducing unnecessary regulatory burden). The staff has identified additional areas where the effectiveness and efficiency of power uprate application and review processes can be further improved and has formulated a plan to achieve these improvements. In formulating the plan, the staff considered insights gained from

experience with license renewal processes, lessons learned from previous power uprate reviews, and feedback received from internal and external stakeholders. The staff is continually assessing ways to improve power uprate processes and will continue to seek input from internal and external stakeholders on ways to improve these processes. If additional improvements are identified during the staff's ongoing efforts, the plan will be updated to include them. A discussion of each of the elements of the plan is provided below.

#### (1) Planning and Scheduling Tools

The staff will continue to survey licensees on a semiannual basis regarding their plans to submit power uprate applications. This information will enable the staff to plan ahead for future work in this area and thereby prevent delays in its reviews.

The staff is currently developing detailed models of power uprate processes. The models will utilize the results of the surveys to forecast resource needs and generate schedules for ongoing and future power uprate activities. The models will be integrated into the Office of Nuclear Reactor Regulation's (NRR's) centralized work planning activities. The staff will use these models to ensure that resources are available to promptly start the reviews upon receipt of the applications and complete the reviews on schedule. Completion of the reviews on schedule could reduce unnecessary regulatory burden by reducing costs associated with delays in implementing the power uprates. The staff will also use these models to generate detailed schedules with appropriate milestones to allow enhanced monitoring of the reviews and early identification and resolution of problems. This is expected to reduce the duration of the reviews and prevent unnecessary delays in schedules.

#### (2) Utilization of Resources

The staff has seen a decrease in resource expenditures when experienced reviewers are repeatedly used. Therefore, the staff will continue to seek ways to plan work such that where and when appropriate, experienced reviewers are involved in power uprate reviews. If less experienced reviewers are assigned to these reviews, the staff will ensure that they are appropriately trained to minimize any adverse impacts on schedules. Efforts will be made to use the same set of experienced reviewers for power uprate reviews to make the reviews more consistent, facilitate better communication and coordination among reviewers, and build an experience base more specific to power uprates.

The use of the same set of experienced reviewers should result in power uprate reviews that are more consistent, complete, and thorough (i.e., reviews that are effective and maintain safety). The use of the same set of reviewers will increase the reviewers' familiarity with power uprate processes. Over time, this should reduce the level of effort and time required to perform reviews of these applications (i.e., improve efficiency of the reviews). Reductions in the staff's review time could reduce costs associated with any delays in implementing the power uprates (i.e., reduce unnecessary regulatory burden).

### (3) Monitoring, Trending, and Project Management

The staff has initiated efforts to (1) monitor, trend timeliness and resource expenditures, and report progress of individual power uprate reviews and (2) evaluate the need for process improvements. Periodic reports are currently being used to inform line managers of the status of individual power uprate reviews, including milestones and potential problem areas, and to ensure that appropriate management attention is being given to these reviews. This is consistent with the Commission's direction to assign power uprate reviews a high priority. The staff will consider enhancements to the current methods of monitoring individual power uprate reviews and will develop new methods as necessary to monitor and trend the progress of the overall power uprate program. These methods will further assist management in its oversight of the power uprate program.

Stronger management oversight is expected to result in early identification and resolution of problems, thereby reducing the duration of the reviews and preventing unnecessary delays in schedules. The staff expects this to lead to more efficient power uprate reviews and a reduction of unnecessary regulatory burden associated with delays.

### (4) Assessment of Past Reviews and Lessons Learned

In its efforts to identify additional areas for improvement in power uprate processes, the staff will perform assessments of recently completed EPU reviews, RAIs, the Maine Yankee Lessons Learned Task Group Report, and feedback received from internal and external stakeholders. In ACRS letters on recent power uprate reviews, the ACRS commented that although the depth and breadth of the staff's power uprate reviews have been adequate, several improvements could be made. The ACRS recommended that the staff (1) develop a Standard Review Plan for power uprates, (2) develop criteria for use in determining when independent calculations should be performed by the staff, (3) improve the documentation of its reviews in safety evaluations, (4) assess the need for more detailed thermal-hydraulic models, (5) conduct more detailed reviews of risk information, and (6) review reload safety analyses for transitional core reloads. As part of this effort, the staff will consider the ACRS comments. Based on the results of these assessments, the staff will reexamine the scope of review to determine if it is appropriate and effective. The staff will also examine RAIs to identify areas where repeat RAIs are being generated (i.e., where licensees have not been able to improve their applications based on past experience). The staff will share the results of these efforts with internal and external stakeholders and will use the findings in developing the review standard for EPUs.

The effort described above will help the staff develop a review standard that is appropriately focused and that effectively addresses areas important to maintaining safety. Based on the results of this effort, the review scope for power uprates may be changed. The staff will utilize the elements of the plan to ensure that reviews are conducted in a manner consistent with the Agency's four performance goals of maintaining safety, improving internal effectiveness and efficiency, increasing public confidence, and reducing unnecessary regulatory burden.

### (5) Standardization of Application and Review Processes

The staff issued guidance to licensees on the content of MUR power uprate applications in RIS 2002-03. The staff will utilize RIS 2002-03 for guidance on the scope and depth of review for these applications. Appropriate use of the RIS is expected to improve the effectiveness and efficiency of MUR power uprate reviews while maintaining safety. The more focused review scope provided in RIS 2002-03 and improvements in the efficiency of MUR power uprate

reviews are expected to result in a reduction of unnecessary regulatory burden. In addition, to ensure that the public was involved in development of this RIS, the staff conducted a public workshop on the guidance in August 2001. The staff has received several applications for MUR power uprates that referenced RIS 2002-03. The staff will monitor the reviews of these applications to assess the impact of RIS 2002-03 on the effectiveness and efficiency of MUR power uprate reviews.

The staff is currently reviewing two General Electric Nuclear Energy (GENE) topical reports for power uprates. One is for MUR power uprates. The second is for EPU applications that are achieved without changing the reactor steam dome pressure. The staff's reviews of these topical reports are nearing completion. The staff believes that use of topical reports promotes higher levels of standardization and quality of plant-specific submittals, and usually improves the effectiveness and efficiency of the staff's reviews.

In a recently proposed Commission Paper, the staff indicated that it will develop a review standard for EPU applications. The review standard will include (1) a clearer definition of the review scope, (2) references to existing review criteria, and (3) template safety evaluations. The staff will incorporate lessons learned during past reviews in the review standard to ensure that adequate guidance is included on the scope and depth of review. The staff will consider comments received to date from internal and external stakeholders, including the ACRS in the development of the review standard. Development of the review standard will also (1) help NRR retain institutional knowledge being lost to retirement, (2) provide guidance for the large number of new hires expected over the next few years, (3) update the current Standard Review Plan, and (4) establish a sustainable legacy of review criteria, methods, and procedures. This review standard will be consistent with NRR's vision for having a fully operational Centralized Work Planning Center to plan, schedule, and monitor NRR work.

In addition to the above efforts by the staff, the Nuclear Energy Institute (NEI) has expressed interest in developing white papers under the auspices of the Licensing Action Task Force to provide guidance for licensees on preparing power uprate applications that is consistent with the review standard initiative. The staff believes that these efforts could further improve the efficiency of power uprate reviews by making licensee applications more complete. The staff is supportive of NEI's efforts and is planning to have further dialogue with NEI on these matters.

Development and use of the review standard for the scope and depth of reviews for power uprate applications would ensure that consistent, complete, and thorough reviews are performed and that such reviews are commensurate with the safety significance of the technical areas under review. Therefore, development and use of such a review standard should continue to maintain safety and improve the effectiveness of power uprate reviews. In addition, during a March 19, 2002, workshop, external stakeholders indicated that a large number of requests for additional information are being generated during staff reviews of power uprates. The participants expressed their desire for additional guidance on the scope and level of detail that should be included in power uprate applications. This guidance would allow licensees to provide the information needed for the staff's reviews in their initial power uprate applications and thereby improve the efficiency of the reviews. The review standard will better define the review scope and review criteria for EPU applications. This will make EPU reviews more transparent and should therefore increase public confidence. In developing the review standard, the staff will provide an opportunity for public involvement through the public comment process, which should also lead to increased public confidence.

(6) Communication Plan

The staff will develop a formal communication plan to ensure that its goals for the power uprate program and the efforts to achieve these goals are communicated with internal and external stakeholders. The staff will continue to use the NRC Web site, generic communications (i.e., RISs, information notices, etc.), status reports, and workshops to communicate with internal and external stakeholders. The staff will evaluate options for enhancing communications. The communication plan will identify (1) internal and external stakeholders, (2) the information needs of the various stakeholders, and (3) methods for communicating the different types of information with the various stakeholders.