May 1, 2001

MEMORANDUM TO: Chairman Meserve
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield

FROM: William D. Travers ***/RA/ by William F. Kane***
Executive Director for Operations

SUBJECT: STAFF READINESS FOR FUTURE LICENSING ACTIVITIES

This responds to the staff requirements memorandum (SRM) of February 13, 2001, in which the Commission directed the staff to "assess its technical, licensing, and inspection capabilities and identify enhancements, if any, that would be necessary to ensure that the agency can effectively carry out its responsibilities associated with an early site permit application, a license application, and the construction of a new nuclear power plant." In addition, the staff was directed to "critically assess the regulatory infrastructure supporting both Parts 50 and 52, and identify where enhancements, if any, are necessary." The Commission further directed the staff to integrate the tasks identified during this effort with the various related activities that are underway and provide the Commission with a schedule for completing these tasks, being thoughtful and judicious in committing resources.

Discussion

In the following discussion of the current activities and plans to address the Commission's SRM, each office's activities are addressed by topic. A preliminary schedule through 2003 for the items discussed in this paper is summarized in the attached figure. The Office of Nuclear Reactor Regulation (NRR) and the Office of Nuclear Regulatory Research (RES) are establishing organizational changes to prepare for these future licensing activities.

NRR is in the process of establishing the Future Licensing Organization (FLO), which will be responsible for coordinating the preparations for the review of new applications (i.e., early site permits, design certifications, and combined licenses), and to manage the AP1000

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pre-application review and other activities listed below. FLO's near-term objectives are to identify (1) the steps that may need to be undertaken by the staff to prepare for licensing reviews, (2) the necessary resources and technical skills needed to perform these reviews, and (3) areas for improvements so that the reviews can be completed in a predictable time frame, based on past experience.

The establishment of FLO is a two-phase process. Initially, approximately 10 NRC staff members, some of whom have experience with standard and advanced reactor reviews and environmental reviews, have been temporarily assigned to (1) provide central points of contact within NRR for matters concerning future licensing efforts, (2) manage certain related initiatives currently underway (rulemaking activities, AP1000 pre-application review), (3) coordinate efforts to perform the readiness assessment, and (4) interact with Nuclear Energy Institute (NEI) working groups (e.g., NEI's siting task group), and other stakeholders. By the end of 2001, NRR plans to establish an organization that will continue these initial efforts and carry out the tasks established as a result of the readiness assessment.

RES is leading the staff's efforts with respect to the Department of Energy's (DOE) Generation IV program and initiatives on non-light-water-reactor (LWR) advanced designs. The goal of DOE's Generation IV program is to develop nuclear energy systems that would be available for worldwide deployment by 2030 that would have competitive economics, improved safety, improved environmental benefits, and enhanced proliferation resistance. The non-LWR advanced designs include modular high-temperature gas-cooled reactors (HTGRs) such as the Pebble Bed Modular Reactor (PBMR) being designed and developed in South Africa and the Gas Turbine-Modular Helium Reactor (GT-MHR) being designed and developed by General Atomics (GA). RES is in the process of establishing the Advanced Reactors Group (ARG) to serve as a focal point in RES for interactions with NRR, the Office of Nuclear Material Safety and Safeguards (NMSS), DOE, reactor designers, and potential applicants on matters related to advanced reactors. The ARG will be responsible for managing the advanced reactor technology, Generation IV, and non-LWR pre-application assessment work conducted by RES with the support of NRR and NMSS. The pre-application assessment work is also expected to provide input to the readiness assessment for Generation IV non-LWRs.

The Special Projects Branch in the Fuel Cycle Safety and Safeguards Division will serve as a central point of contact for coordination and review activities within NMSS. The primary role of NMSS will be to support future licensing efforts in areas of fuel fabrication, transportation, safeguards, and waste storage and disposal, with focus on any unique technical or regulatory issues associated with non-light-water-reactor advanced designs and increased enrichment levels.

Beyond the organizational infrastructure changes described above, a number of specific activities are already working or planned to begin as described below.

Future Licensing and Inspection Readiness Assessment

An early initiative has been to create the Future Licensing and Inspection Readiness Assessment (FLIRA) interoffice working group to address the ability of the NRC to support future application reviews under 10 CFR Parts 50 and 52. Approximately 11 NRC staff members from NRR, RES, NMSS, Office of Human Resources (HR), and the Office of the

General Counsel (OGC) will participate part time in the FLIRA working group. This group will operate under the direction of the director of the FLO.

The working group will provide an assessment of the following matters to the Commission in September 2001:

- postulated licensing scenarios for the future application reviews, durations of reviews (linked to milestones), and resource estimates in full time equivalent (FTE) and technical assistance support

- critical skills that must be available within the agency or that can be accessed through contractual agreements to perform these reviews

- necessary interfaces (intra- and inter-office, Advisory Committee on Reactor Safeguards (ACRS), stakeholders, Commission)

Early Site Permit Group

A group of experienced NRR staff has been identified to assess activities necessary to prepare for early site permit (ESP) applications (including pre-application inspections). This group will provide input to the FLIRA working group in a time frame consistent with their assessment schedule. One of the early issues that has been identified is access to key technical expertise that may reside within the agency. This access may be limited because of other competing priority projects (e.g., possible review of a license application for a high-level waste repository) and therefore, additional resources (including contractor support) may be needed.

In the interim, the staff has developed a scenario for receiving one early site permit in 2002, two in 2003, and one in 2004. This scenario is based on oral statements by industry representatives and staff assumptions. In advance of site approval applications, the staff expects to interact with prospective applicants to ensure that siting information has been developed with appropriate quality standards and representations of site conditions. This activity would also involve pre-application inspections of potential sites.

Pre-application and License Reviews

FLO is currently managing the Phase 2 portion of the Westinghouse AP1000 pre-application effort, in which the staff has been requested to provide feedback that will provide information to Westinghouse that will assist them in deciding whether to apply for design certification. The staff plans to issue its recommendation to the Commission on this portion of the review by the end of calendar year 2001.

A design certification application for the AP1000 is possible in 2002. The AP1000 assumption is based on a letter from Westinghouse dated December 12, 2000. Westinghouse stated that it would be prepared to submit its application in early calendar year 2002, but the date may be affected by the results of the AP1000 pre-application review. The preliminary schedule and rough resource estimates for this effort assume no hearing and minimal re-review of most of the AP600 design control document, on which the AP1000 design is based.

In a letter dated December 5, 2000, Exelon Generation Company (Exelon) requested early interactions with the staff on the feasibility of licensing the PBMR design in the United States. RES has taken the lead to develop a plan for pre-application activities on the PBMR, which is described in SECY-01-0070, "Plan for Pre-Application Activities on the Pebble Bed Modular Reactor (PBMR)," dated April 26, 2001.

Based on discussions at an April 30, 2001, meeting with Exelon, an application for a combined license for the PBMR is possible in late calendar year 2002. Exelon representatives also indicated that a design certification application for the PBMR may be submitted late in the combined license application phase. The staff has assumed that this could occur in 2005.

Westinghouse has recently requested a preliminary meeting with the staff to discuss the IRIS (International Reactor Innovative and Secure) design and plans for development testing (the meeting is planned for May 7, 2001, at NRC headquarters). Following this meeting, the staff should be in a better position to plan for future activities on IRIS. However, in the interim, the staff is assuming additional pre-application activities in the 2002 and 2003 time frame. A design certification application for Westinghouse's IRIS design is not expected for several years.

In a March 22, 2001, letter, General Atomics requested exploratory discussions with NRC on how to proceed with the licensing of its GT-MHR design. Because these discussions are in the early stages, the staff does not yet have detailed schedule information; however, based on statements made by GA representatives, pre-application activities may be requested as early as 2002.

Some of the pre-application and license reviews discussed in this section will need fuel cycle infrastructure, licensing, and certification review support. For example, the designs will have to be assessed for unique technical, environmental, and regulatory activities in the areas of fuel material enrichment and fabrication; transportation, storage, and safeguards of fresh and spent fuel; and waste disposal. This fuel cycle support would have to be in place before startup and operation of the plants.

Regulatory Infrastructure

Rulemaking efforts are currently underway to update 10 CFR Part 52 to address lessons learned from the experience of certifying three nuclear plant designs and clarify the processes for future application reviews. In a September 3, 1999, letter, the NRC solicited stakeholder comments and suggestions on a proposed update to 10 CFR Part 52. The staff received a response to this solicitation from NEI on April 3, 2001. In order to respond to these comments, the staff intends to delay its target date for the proposed rulemaking in this area from July 2001 to September 2001 to address the issues that were identified. Related rulemakings are also being planned, one of which is discussed in a December 18, 2000, memorandum to the Commission. In that memorandum, the staff provided a schedule for rulemaking associated with alternative site reviews. Additional rulemakings in the environmental area that are being considered include revisions to Tables S-3 and S-4 of 10 CFR Part 51 to address higher burnup fuel considerations and non-LWR advanced designs.

The staff will address the need to update regulatory and review guidance for future licensing applications, i.e., Standard Review Plans (SRPs), Regulatory Guides, and referenced codes and standards, and identify where enhancements are needed. The staff will have a better understanding of the extent of this effort and the necessary schedule and resources after the FLIRA working group assessment has been completed, although the staff does not expect this effort to begin until FY 2004.

During the 2001 Regulatory Information Conference, and at a public meeting with the staff on April 5, 2001, NEI proposed to replace deterministic regulations with risk-informed, performance-based regulations for future plants, where appropriate. NEI plans to submit a petition for an advance notice of proposed rulemaking (ANPR) for this initiative in December 2001. The NEI-proposed scope of work for the New Plant Regulatory Framework involves the actions needed to develop a conceptual framework of regulations, including general design criteria and general operating criteria. The scope does not include the work needed to develop and implement the associated infrastructure of design-specific regulatory guides and SRPs that would be needed to enable implementation of the framework for licensing purposes.

In an April 5, 2001, meeting with the staff, NEI also discussed the need to review issues such as antitrust reviews, decommissioning funding assurance, and financial qualification need to be reviewed because of the possibility of nuclear power plants being built as merchant plants. In addition, NEI suggested that Price-Anderson secondary protection, NRC rules governing annual fees, and operator staffing should be reviewed. The staff plans to begin preliminary work on this effort later this year.

The staff also needs to begin development of the regulatory infrastructure with respect to certain advanced technology assessment. Resources for code development have been included to provide the NRC with an independent capability to analyze the safety of non-LWR designs. This work would include code development (thermal-hydraulic, severe accident, fuels) and related testing to validate the codes. Additional advanced technology assessment in instrumentation and controls and human factors will begin. These efforts are being conducted by RES and are expected to begin in FY 2002.

In order to prepare for future applications NRR will reactiviate the construction inspection program revision effort suspended in 1994. This effort will include review and revisions of applicable inspection manual chapters and development of the associated inspection guidance and training for inspection of critical attributes of construction processes and activities.

Coordination and Communication with Stakeholders

The staff intends to communicate with stakeholders to ensure there is a clear understanding of upcoming activities related to future applications and to solicit stakeholder input. The staff is currently evaluating which communication tools should be used, and is considering the use of a public workshop to solicit stakeholder input and the creation of a web site to keep stakeholders informed of future licensing activities. The staff has had discussions with NEI, which is establishing four working groups to address current 10 CFR Part 52 licensing matters, early site permits, financial considerations, and the proposed new plant regulatory framework. NEI is being encouraged to provide information about new applications to support the staff's readiness reviews. Public meetings have been held with NEI and are being scheduled in the following months.

The staff will be meeting with the ACRS during its June workshop on advanced reactor designs, and plans to meet with the ACRS as necessary to support this effort. The staff has been holding technical and scheduling meetings with Westinghouse and Exelon, and will ask these potential applicants to provide input to support the related assessment activities. DOE has established the Near-Term Deployment Group to "identify technological and institutional gaps between the current state of the art and the necessary conditions to deploy new nuclear plants in the United States before 2010."

Resources

At the time the FY 2002 budget was developed, there was no indication of industry interest in future licensing activities and essentially no resources were included for these initiatives in the FY 2002 Budget Estimates and Performance Plan currently under consideration by Congress. Only recently has the industry shown significant interest in new construction. As a result the staff has estimated resources necessary to accomplish the activities identified in this memorandum for fiscal years 2001 and 2002. The staff is confident that it can complete the effort necessary for FY 2001 within the estimated FY 2001 resources. The estimate for FY 2002 is more uncertain, as the timing and pace of effort will be affected by the scope, timing and quality of submittals by applicants and industry organizations. In addition, technological or regulatory issues could arise that affect resource requirements and schedules. The staff will have a better understanding of resource needs for future licensing activities after the FLIRA working group completes its assessment.

Agency resources for FY 2001 are expected to be approximately 12 FTE and $270K in contractor support. These resources are necessary to perform the FLIRA working group readiness assessment, manage review initiatives currently underway or scheduled to begin during this period, and implement the PBMR review plan documented in SECY-01-0070. This effort will be accomplished by reprioritizing work using the planning, budgeting, and performance management (PBPM) process. Westinghouse and Exelon will be charged fees in accordance with 10 CFR 170 for NRC resources expended for the AP1000 and PBMR pre-application reviews, respectively.

The FY 2002 preliminary estimate of additional resources needed is approximately $15 - 18 million (including salary and benefits for approximately 50-60 FTE). This estimate is currently being reviewed and evaluated, in particular the estimated support cost needs. It includes direct and indirect costs for the program offices to accomplish the efforts described previously in this paper and supporting office costs such as legal advice, recruitment and retention incentives, training initiatives, security clearances, space alterations, and additional information technology equipment and support. The staff is in the process of developing the FY 2003 budget. The FY 2003 resource estimates for the future licensing activities will be included in the budget to be submitted to the Commission in June 2001.

While there is uncertainty associated with the specific activities that will be proposed by industry and the schedules on which they will be proposed, the staff is confident that sufficient future work will occur to warrant some hiring activities at the present time. In order to backfill for the staff members displaced by the future licensing activities through September 2001, the staff

plans to begin the process of hiring additional staff. In the unlikely event that all industry initiatives associated with the licensing of future plants does not occur, the impact of the additional staff can be accommodated through normal attrition.

Agency 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 objections.

Conclusions:

The staff will be interacting with stakeholders in future review and licensing activities to ensure that it has a clear understanding of upcoming application plans. The staff will inform the Commission of the results of its readiness assessment and its recommendations when the assessment is completed in September 2001. At that time, the staff will recommend appropriate activities, including refined schedules and resource estimates, that are necessary to address these recommendations.

Attachment: As stated

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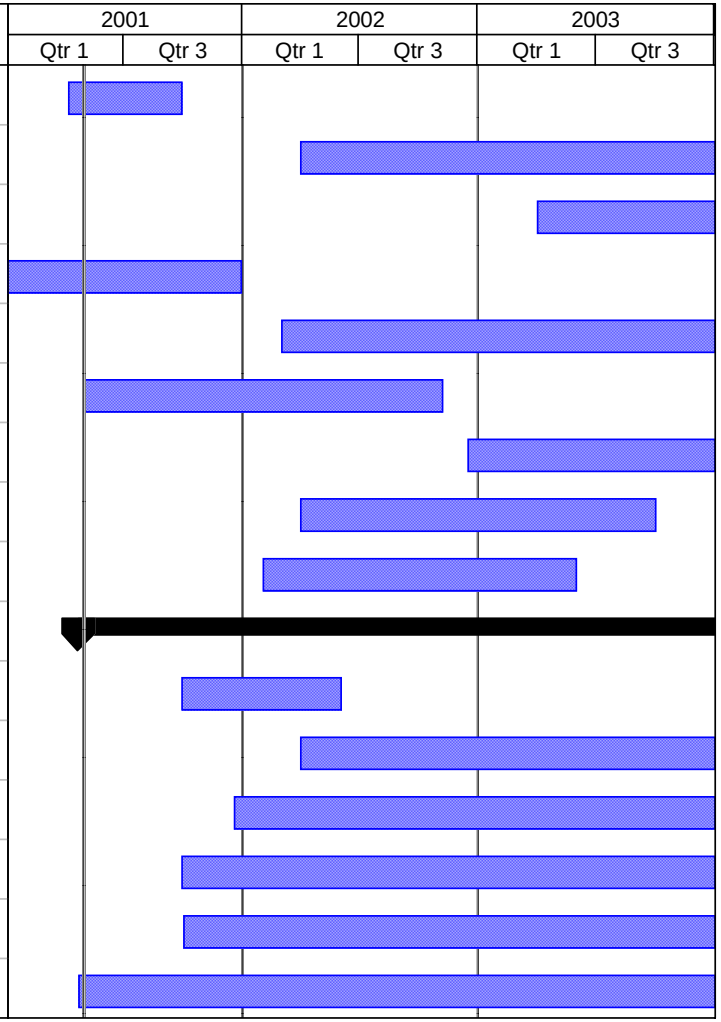
Figure - Estimated Future Licensing Timeline in Calendar Years

ID	Task Name
1	**Future Licensing and Inspection Readiness Assessment**
2	**Early Site Permit - 1st application**
3	**Early Site Permit - 2nd and 3rd applications**
4	**AP 1000 pre-application review - Phase 2**
5	**AP 1000 design certification review**
6	**PBMR pre-application review**
7	**PBMR combined license application (without ESP)**
8	**GT-MHR pre-application review**
9	**IRIS pre-application review**
10	**Regulatory Infrastructure**
11	Part 52 Rule
12	Clarify/modify environmental related regulations
13	New Plant Regulatory Framework
14	Review/clarify/modify financial related regulations
15	Advanced Technology Infrastructure
16	Construction Inspection Program Reactiviation



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