# POLICY ISSUE
## INFORMATION

October 12, 2001 SECY-01-0188

FOR: The Commissioners

FROM: William D. Travers
Executive Director for Operations

SUBJECT: FUTURE LICENSING AND INSPECTION READINESS ASSESSMENT

PURPOSE:

This Commission paper presents the staff's assessment of its readiness to review applications for licenses and to inspect new nuclear power plants in response to the February 13, 2001, staff requirements memorandum (SRM) for COMJSM-00-0003, "Staff Readiness for New Nuclear Plant Construction and the Pebble Bed Modular Reactor."

SUMMARY:

The staff concludes that the NRC's licensing processes in 10 CFR Part 52 are ready to be used and the NRC is ready to complete new reactor licensing activities currently underway, such as the pre-application reviews for the AP1000 and the Pebble Bed Modular Reactor (PBMR) and current rulemaking activities for 10 CFR Part 51 and Part 52. Additional work is needed in order to ensure the staff will be ready to effectively carry out its responsibilities associated with the review of early site permits (ESPs), license applications, and construction of new nuclear power plants, given the potential for significant new licensing activity over the next several years. Staff decisions regarding the relative priorities of new reactor licensing activities will depend largely on the number and timing of industry decisions to pursue new licensing activities. In making these decisions, the staff will remain focused on the agency's Advanced Reactor Policy and its performance goals of maintaining safety, protecting the environment and the common defense and security; increasing public confidence; making NRC activities and decisions more effective, efficient, and realistic; and reducing unnecessary regulatory burden.

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The staff recognizes that the events of September 11, 2001, could have a significant effect on future licensing activities. The staff performed the assessment presented in the attached report prior to September 11, 2001, and, therefore, it does not reflect consideration of any potential changes to future licensing activities or their associated schedule and resource estimates. In addition, new security and safeguards requirements could further burden the security and safeguards staff. The staff will incorporate changes relating to issues resulting from the events of September 11, 2001, as they are identified, and will include this information in the staff's future correspondence to the Commission.

BACKGROUND:

In the SRM for COMJSM-00-0003 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 ESP 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 Part 50 and Part 52, and other applicable regulations, and identify where enhancements, if any, are necessary. The Commission further directed the staff to incorporate into its planning the need for early interactions with the Advisory Committee on Reactor Safeguards and to integrate the tasks identified during this effort with the various related activities that are underway. The Commission also directed the staff to provide the Commission with a schedule and resource estimates for completing these tasks. The Commission stated that the staff should encourage the industry to be as specific as possible about its plans and schedules so that the agency can plan and budget for advanced reactor activities without disrupting other current important initiatives. The Commission also stated that the staff should work with NRC stakeholders to exercise, to the extent appropriate, the NRC's review process and identify potential policy issues that should be addressed by the Commission in a timely manner.

DISCUSSION:

The staff provided its initial response to the February 13, 2001, SRM in a May 1, 2001, memorandum to the Commission. As the staff stated in that memorandum, the Future Licensing and Inspection Readiness Assessment (FLIRA) interoffice working group was established to address the ability of the NRC to support future application reviews under 10 CFR Parts 50 and 52 and other applicable regulations. The working group consists of a team of senior representatives from the Offices of Nuclear Reactor Regulation (NRR), Nuclear Regulatory Research (RES), Nuclear Materials Safety and Safeguards (NMSS), and the Office of the General Counsel. The working group also actively interfaced with the Regions, the Office of Human Resources, and other support offices. The FLIRA working group assessed the following matters:

- Licensing scenarios for the future application reviews, the durations of the reviews, and resource estimates to complete the reviews in full-time equivalents (FTE) for the NRC staff and in dollars for technical assistance support;

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

- Regulatory infrastructure needs to support future licensing reviews.

The attachment contains the FLIRA working group's assessment report. In developing its estimates of the durations and resources required to conduct the reviews discussed in the report, the staff considered (1) the results of a critical skills and resources survey taken of the staff in August 2001 to support this assessment, (2) industry plans and proposed schedules as discussed in public meetings and correspondence, (3) its past experience with licensing and pre-application reviews; (4) the effect of complex issues on these reviews; and (5) estimates from previous resource and schedule evaluations. The resource estimates developed reflect the most recent information received regarding industry plans and the staff's best estimate at this time regarding resource needs, recognizing that budget realities may not be consistent with the needs.

It should be noted that these assessment efforts are only the first step in a multi-phased process of establishing detailed schedule and resource estimates for new reactor licensing activities. As formal commitments are received regarding industry plans for new reactor licensing activities and as the staff gains additional knowledge through pre-application reviews and additional assessment work, we will work through the planning, budgeting, and performance management (PBPM) process to identify priorities and allocate resources to those priorities for the coming years. During this process the staff will continue to refine the schedule and resource estimates for each licensing scenario to establish detailed resource-loaded schedules as applications are received.

Technical, Licensing, and Inspection Capability

The assessment identified current skill gaps within the three major review offices, NRR, RES, and NMSS and in the Regions. A skill gap within the agency occurs when individuals with expertise in certain technical areas either (1) are limited in number, working on important agency initiatives in other areas and not currently working in the office where the gap exists; (2) are near retirement or are expected to leave the agency within 6-12 months; or (3) do not exist in the agency.

The assessment identified skill gaps in NRR in some areas of site safety review (especially in geotechnical areas) and nearly all areas of site environmental review. The assessment also identified skill gaps in the areas of historical and archeological resources and financial analysis (antitrust reviews). In addition, the staff identified skill gaps in the areas of gas reactor technology and new fuel designs. A critical skills gap of reactor construction inspectors in the geotechnical area (e.g., geology, hydrology, seismology) was also identified in both NRR and the Regions.

The staff has also identified skill gaps within RES in several key areas. There is a shortage of experts in some key disciplines (e.g., materials engineering), due to their being involved in work related to current plants, and a total absence of specialized skills in a few select areas to effectively support the future reactor licensing activities. These areas include fire protection, chemical engineering, metallurgy, HTGR fuel technology, graphite technology, and HTGR accident analysis, including source term.

NMSS and OGC did not identify any skill gaps that would affect the staff's short-term ability to carry out its responsibilities related to support of new reactor licensing activities. If a greater amount of work is realized than is being projected, however, there would be staffing constraints.

The staff believes that, in the short term, the agency can obtain many of these skills through contracted technical assistance. Other skill gaps will have to be addressed through ongoing strategic workforce planning initiatives undertaken by the Office of Human Resources (HR). The program office staff has been working closely with HR to ensure that HR's planning efforts reflect the information gathered through this assessment and to ensure that the staff remains actively engaged in the agency's human capital initiatives.

Regulatory and Technical Infrastructure

Over the past few years, the NRC has undertaken a number of regulatory infrastructure (e.g., rule changes) improvements, including the promulgation of the alternative licensing processes in 10 CFR Part 52, that provide a foundation for future licensing activities. Because of these improvements, the current NRC regulatory infrastructure is adequate to support future licensing. However, the staff has identified a number of regulatory infrastructure changes discussed in the attached report that would make future licensing reviews more effective and efficient as well as reduce unnecessary regulatory burden during a licensing review.

Stakeholder Interactions

In order to address the Commission's directive that the staff should work with the NRC's stakeholders to exercise, to the extent appropriate, the NRC's review process, NRR prepared the New Reactor Licensing Communication Plan and forwarded the plan to the Executive Director for Operations (EDO) on July 27, 2001. The plan describes both internal and external communication activities for plant-specific future licensing applications, generic activities, and process improvements. In addition, the staff has developed a supplemental communications plan for the FLIRA report to ensure that mechanisms are identified for external stakeholders to comment on the resource and schedule estimates contained in the report. The plan includes issuing a Federal Register Notice announcing the release of this SECY paper and the attached report as well as plans to discuss the FLIRA results at public meetings with interested stakeholders.

In an early effort to reach out to external stakeholders, the staff held a public workshop on July 25 and 26, 2001, to (1) inform the public of the current and proposed activities of the NRC staff to prepare for potential future licensing applications; (2) discuss the mechanisms available to the public for providing input during these licensing activities; and (3) solicit public feedback on identified issues and challenges. The workshop topics included (1) NRC readiness to support future licensing activities; (2) 10 CFR Part 52 licensing processes; (3) reactivation of the construction inspection program; (4) applicable rulemakings; (5) ongoing pre-application reviews; and (6) nuclear fuel cycle infrastructure issues, including nuclear waste management and transportation. The workshop was attended by 83 participants from outside the NRC and the vast majority of the comments received following the workshop were favorable. The staff will consider additional workshops on more specific topics as interest dictates. The staff will also continue to interact with the Nuclear Energy Institute (NEI), potential applicants and other interested stakeholders in a public forum at which the FLIRA results will be addressed.

In its February 13, 2001, SRM, the Commission also directed the staff to incorporate into its planning the need for early interactions with the Advisory Committee on Reactor Safeguards (ACRS). To this end, the staff participated in an ACRS public workshop on regulatory challenges for future nuclear power plants on June 4 and 5, 2001. Since the workshop, the ACRS has formed a Subcommittee on Future Plant Designs and the staff has met with the ACRS staff contact to discuss future interactions with the new subcommittee and with the ACRS full committee. The program offices are coordinating staff interactions with the ACRS on new reactor licensing activities and have been providing periodic updates to the ACRS staff's list of future ACRS interactions.

Industry Schedules

The Commission stated that the staff should encourage the industry to be as specific as possible about its plans and schedules so that the agency can plan and budget for advanced reactor activities without disrupting other current important initiatives. The most current information with regard to industry schedules is an August 10, 2001, letter from NEI's Marvin Fertel to Chairman Meserve. This letter provides an integrated industry schedule for new plant activities and identifies when power companies will make business decisions on whether to proceed. Based on the NEI letter, the staff expects to receive requests to begin the International Reactor Innovative and Secure (IRIS) and Gas Turbine - Modular Helium Reactor (GT-MHR) pre-application reviews in early to mid fiscal year (FY) 2002. In addition, the staff expects that it will receive one ESP application in the middle of FY 2002, and at least two additional ESP applications in mid-FY 2003. Assuming decisions by Westinghouse Electric Company, Exelon Generation, and General Atomics to move forward, we expect to receive an application for certification of the AP1000 design in early FY 2002, a combined license (COL) application for the PBMR in early FY 2003, and a COL application for the GT-MHR in early FY 2004. Design certification reviews for the PBMR and for IRIS could be submitted in the 2005-2006 time frame.

Potential Policy Issues

In its February 13, 2001, SRM, the Commission asked the staff to identify potential policy issues that should be addressed by the Commission in a timely manner. The staff has identified a number of such issues related to future licensing activities that should be addressed as part of the NRC's readiness efforts. In addition, the staff expects to identify additional issues during the ongoing pre-application reviews and regulatory infrastructure activities. The staff will continue to provide these issues to the Commission as they are identified. The staff discussed many of these issues with the Commission in a July 19, 2001, Commission briefing on readiness for new plant applications and construction. Because these issues will be addressed in future Commission correspondence, they are not addressed in this paper. The current schedule for future correspondence items that will address these issues is shown in the following table.

| Item | Date of Commission Correspondence |
|---|---|
| Paper on issues raised in Exelon's legal and financial white papers | November 2001 |
| Paper on Exelon's regulatory licensing approach | November 2001 |
| AP1000 Phase 2 review report | February 2002 |
| Recommendation on programmatic inspections, tests, analyses, and acceptance criteria (ITAAC) | March 2002 |
| Proposed rule on 10 CFR Part 52 revision | April 2002 |
| Paper on alternative regulatory frameworks for advanced reactor designs | June 2002 |
| Paper on technical issues for Pebble Bed Modular Reactor (PBMR) | June 2002 |
| Paper on policy issues for PBMR | December 2002 |

Research Plan

The staff believes that an early identification of the scope and schedule of research, development and testing will support an efficient and effective licensing process, and will also provide a sound basis for budgeting and planning. RES, in coordination with other offices, will develop a research plan, identifying major areas of research and development to support the advanced reactor licensing efforts. This research plan will include details of the anticipatory and confirmatory research, including development of the technical basis for any future regulatory framework or requirements, analytical code development efforts to model the design and operational characteristics of the new reactors, materials testing, and fuels testing. In addition to the scope of the future research, this research plan will also provide resource and schedule estimates. Various universities in the United States and the national laboratories offer facilities to conduct the needed research; however, some modifications to them may be necessary to obtain the desired experimental data. Cooperative research will be a key factor in developing research plans. The staff plans to have an initial version of this research plan on a schedule for formulation of the FY 2004 budget.

July 31, 2001 SRM

Following the July 19, 2001, Commission briefing on readiness for new plant applications and construction, the Commission issued an SRM that directed the staff to consider two items in preparing for new reactor licensing. The first item for consideration was an integrated international research program on gas reactors to reduce costs, leverage facilities in various countries, and obtain information more quickly. The staff is developing an integrated international research program on issues related to high-temperature gas reactor (HTGR) safety. An initial meeting of national and international HTGR experts is planned for early

October 2001, at NRC headquarters to discuss the safety issues, their priority, ongoing or planned research, the need for additional research, and potential cooperation. Based on the results of that meeting, the staff will develop plans for cooperation where such cooperation will reduce costs to NRC or result in obtaining information more quickly. Where the need for new research is identified, the staff will explore accomplishing such research via international cooperation. The plans for cooperation will be documented in the research plans discussed above.

The second item the Commission directed the staff to consider was the usefulness of developing a Standard Review Plan (SRP) for combined license applications. SECY-89-104, "Assessment of Future Licensing Capabilities," and SECY-91-041, "Early Site Permit Review Readiness," identified the need to issue new or revised regulations and regulatory guidance in order to prepare for new plant licensing activities. The staff has assessed the status of those updates in the attached FLIRA report.

The staff believes that an adequate process exists to support reviews of future applications. The industry can continue to use Regulatory Guide 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants (LWR Edition)," for formatting the applications. The current standard review plan (SRP) and the environmental standard review plan (ESRP) provide sufficient review guidance, although some updates to the SRP and ESRP are being considered, as discussed in the attached report. During the review of the certified designs (Advanced Boiling Water Reactor (ABWR), System 80+, and AP600) in the 1990s, the staff used the SRP and additional guidance addressed in SECY-90-016, "Evolutionary Light Water Reactor (LWR) Certification Issues and Their Relationship to Current Regulatory Requirements" and SECY-93-087, "Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor (ALWR) Designs," and the applicable SRMs, to guide the review of these designs. However, it is recognized that our current technical requirements and guidance are oriented towards LWRs; for non-LWR designs, changes to these requirements and guidance will be needed.

Unless several new applications for licensing of one class of plant (LWR, HTGR) are proposed, it would not be cost beneficial to complete the update to the SRP and the staff believes that any additional guidance can be developed on a case-by-case basis. In the interim, the results of the pre-application reviews will serve to provide preliminary guidance to both applicants and staff. As industry plans become definite, the staff will reconsider the need for additional review guidance based on the expected number and type of applications.

In conclusion, the staff does not believe it is necessary to develop an SRP to support a COL review because the review can be done using the review process already developed by the staff.

RESOURCES:

Table 1 contains the staff's resource estimates for future licensing application review and inspection scenarios identified in the attached report.

TABLE 1. NRC Resource Estimates for Individual New Application Reviews

| | Staff (FTE) | | | Contractor ($K) |
|---|---|---|---|---|
| | Licensing | Inspection | Research | |
| Pre-Application Review for AP1000 (Phase 2) | 2 | 0 | 0 | $0 |
| Pre-Application Review for PBMR | 5 | 0 | 6 | $700[1] |
| Pre-Application Review for IRIS | 3 | 0 | 12 | $1500 |
| Pre-Application Review for GT-MHR | 4 | 0 | 12 | $1900 |
| Early Site Permit Review (existing site) | 16 | 4 | 0 | $1700 |
| Early Site Permit Review (new site) | 20 | 4 | 0 | $2100 |
| Design Certification for AP1000 | 24 | 1 | 5 | $1500 |
| Design Certification for IRIS | 54 | 3 | 22 | $5600 |
| Combined License for Standard Certified Design | 23 | 65[2] | 0 | $1100 |
| Combined License for PBMR | 60-99[3] | 71[2] | 33 | $8200-$8500[3] |
| Reactivated Plant (WNP-1) | 45 | 40 | 0 | $1700 |
| Reactivated Plant (BFN1) | 12 | 19 | 0 | $0 |

[1]These estimates include approximately 2 FTE and $500K of Department of Energy funding in FY 2002 through a reimbursable agreement.
[2]This estimate includes resources for construction inspection.
[3]The staff provided a low and a high estimate for the PBMR combined license review.

The staff did not estimate resource needs to review an application for a COL for the GT-MHR because the staff did not have information that General Atomics was considering such an application until well after the staff had completed its resource analysis. However, the staff believes that the resource needs to review a COL application that references an ESP for the GT-MHR would be of the same magnitude as the resources needed to review the same type of application for a PBMR.

Table 2 contains the staff's resource estimates for regulatory infrastructure needs identified in the attached report.

TABLE 2. NRC Resource Estimates For Regulatory and Technical Infrastructure to Support New Application Reviews

| | Staff (FTE) | Contractor ($K) |
|---|---|---|
| Regulatory Changes | 28 | $2500 |
| Regulatory and Review Guidance Work | 17 | $2100 |
| Generic Regulatory Technology | 65 | $38,100 |
| Proposed Regulatory Framework to Address Future Designs | 26 | $2600 |
| Construction Inspection Program Development | 27 | $800 |

COORDINATION:

The Office of the General Counsel has reviewed this Commission paper and has no legal objection to its content.

The Office of the Chief Financial Officer has reviewed this Commission paper for resource implications and has no objections.

CONCLUSION:

The staff's assessment of future licensing and inspection readiness identified many activities that may need to be performed in support of new reactor licensing, including the associated resources and review durations. Because of the uncertainty of the plans of potential applicants and because we are in the early phase of the assessment process, the relative priorities of the activities outlined in the assessment are still emerging. As formal commitments are received regarding industry plans for new reactor licensing activities and as the staff gains additional knowledge through pre-application reviews and additional assessment work, we will work through the PBPM process to identify priorities and allocate resources to those priorities for the coming years. In order to keep the Commission informed as decisions are made, the staff will

provide the Commission with semi-annual updates of the status of new reactor licensing activities and the associated resource and schedule implications.

***/RA/***

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Attachment: Future Licensing and Inspection Readiness Assessment Report

provide the Commission with semi-annual updates of the status of new reactor licensing activities and the associated resource and schedule implications.

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Attachment: Future Licensing and Inspection Readiness Assessment Report

CITF

DISTRIBUTION: See attached.

**SECY ML012350040 Attachment ML012140585 Package ML012640279**
***See previous concurrence**

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