Regulatory - Frequently Asked Questions

Question: Does the NRC use different standards or regulations to determine if non-light water reactor technologies are safe enough to be licensed?

Response: The NRC expects, as a minimum, at least the same degree of protection of the environment and public health and safety and the common defense and security that is required for current generation light-water reactors (LWRs). Furthermore, the Commission expects that advanced reactors will provide enhanced margins of safety and/or use simplified, inherent, passive, or other innovative means to accomplish their safety and security functions.

The combinations of design features and operational programs used to provide protections may be different for non-light water reactors because of differences in fuel forms, coolants, inherent characteristics and passive safety systems. For example, offsite emergency preparedness and the possible evacuation of nearby populations are an integral part of risk management for the current large light water reactors. The smaller size, lower probability of severe accidents, slower accident progression, and smaller accident offsite consequences per module that characterize small modular reactors and non-light water reactor designs have led the Department of Energy, reactor designers, and potential operators to revisit the determination of the appropriate size of emergency planning zones, the extent of onsite and offsite emergency planning, and the number of response staff needed. The NRC is considering possible changes to regulatory requirements for emergency preparedness for small modular reactors and other new technologies (see NRC website for additional details).

Question: When should a reactor developer begin its interactions with the NRC?

Response: The NRC encourages early preapplication interactions with reactor designers. The Advanced Reactor Policy Statement states:

To provide for more timely and effective regulation of advanced reactors, the Commission encourages the earliest possible interaction of applicants, vendors, other government agencies, and the NRC to provide for early identification of regulatory requirements for advanced reactors and to provide all interested parties, including the public, with a timely, independent assessment of the safety and security characteristics of advanced reactor designs. Such licensing interaction and guidance early in the design process will contribute towards minimizing complexity and adding stability and predictability in the licensing and regulation of advanced reactors.

Most reactor developers begin interactions with the NRC with informal interactions with the NRC staff, similar to how the NRC staff interacts with members of the public. These interactions allow the NRC staff to learn about preliminary design concepts and provide the reactor developer with information on regulations and agency processes. These early interactions will likely evolve with the reactor developer preparing a regulatory engagement plan to support longer term interactions with the NRC staff and applications for licenses, certifications, or approvals to the NRC. NRC and industry guidance to help developers initiate and manage pre-application interactions with the NRC are available on the NRC website.

Question: How much does the NRC charge for applications and pre-application interactions?

Response: The NRC is required by law to recover approximately 90% of its annual budget from the companies and people to which it provides services (e.g., applicants for NRC licenses, NRC licensees, etc.). The fees are not used directly by the agency but instead are provided to the U.S. Treasury. In other words, the NRC receives its entire appropriation from Congress, and then spends that appropriation to carry out its activities. By the end of each fiscal year, the NRC collects approximately 90% of its appropriation through fees and then takes those fees to reimburse the U.S. Treasury. The agency, therefore, does not have access to the fees that it collects in the sense that all of the costs for the agency's activities must be first appropriated to the NRC from Congress.

For the current fiscal year, Congress directed the NRC to use part of its funding that is not recovered from fees (referred to as off-fee base) to develop the regulatory infrastructure for advanced nuclear technologies. The NRC staff are interacting with industry, standards development organizations, and technology working groups to resolve policy issues, develop guidance documents, and improve the agency's infrastructure for advanced reactors using these off-fee base funds provided through the Congressional appropriations process.

Individual reactor developers are billed for interactions with the NRC staff after limited initial discussions leading to the development and implementation of regulatory engagement plans. The NRC staff will generally charge developers for the staff-hours spent preparing for and attending meetings, review of submittals, and other activities prior to or during the reviews of applications for a license, certifications, or approvals. The hourly rate for NRC staff in fiscal year 2017 is $ 263. An important part of the regulatory engagement plan is to define expectations, expected NRC staff-hours, and related costs such that developers can plan for NRC charges and best define expectations for interactions with the NRC within the design and financial management plans associated with the reactor project.

Additional information about NRC fees are available on the NRC website.

Question: What kind of decisions and finality can reactor developers expect to receive from pre-application interactions with the NRC staff?

Response: The NRC staff described in a draft regulatory roadmap a number of possible outcomes from regulatory interactions (from preapplication stage though the eventual licensing application stage). The outcomes include the following:

- Information exchanges such as information on reactor design concepts, technical information, regulatory requirements, or guidance.
- Initial feedback from NRC staff-level interactions in meetings or correspondence that do not result in documents for referencing in subsequent applications or binding regulatory positions.
- Conditional staff findings provided in correspondence, "preapplication" or "preliminary" safety evaluation reports, topical report safety evaluations, or other records that a proposed design feature, analysis method, or operational program conforms to regulatory requirements or is otherwise acceptable provided that testing, analyses, or other activities are completed and provide the expected results. These findings would be technically

conclusive and would not be revisited assuming any conditions of approval are met and that the design has not changed in such a way as to invalidate the staff's findings. These findings do not however have finality with respect to future Commission decision making and could be subject to hearing opportunity as part of a future licensing proceeding.

- Conclusive staff findings provided in correspondence, safety evaluations, or other records that an applicant has provided sufficient justification to conclude that a proposed design feature or operational program conforms to regulatory requirements or is otherwise acceptable. Conclusive findings are developed and documented using established agency processes and include the appropriate reviews but do not have finality with respect to future Commission decision making or licensing proceedings.
- Final agency positions are those established in regulations, issued licenses or certifications, Commission decisions and orders, and other documents issued following the review and approval by the Commission or delegated official. The NRC processes for changing final agency positions are defined by regulations such as 10 CFR 50.109, "Backfitting," and 10 CFR 52.63, "Finality of standard design certifications."

Question: Does the NRC support a staged licensing approach for advanced reactors?

Regulatory: Staged licensing is an approach involving reductions in regulatory uncertainties that are achieved by incremental spending during the reactor design process. The NRC staff described in a draft regulatory roadmap the flexibility provided by various preapplication interactions and actual applications for licenses, certifications, and approvals. The roadmap includes the use of informal interactions, creation of important reference documents (e.g., topical reports, consensus codes and standards), preapplication activities in the conceptual or preliminary design process, standard design approvals, and applications provided under Parts 50 or 52 of NRC's regulations. The possible outcomes from regulatory interactions (from preapplication stage though the eventual licensing application stage) include informal feedback, NRC staff findings, and final agency positions. Reactor developers will interact with the NRC staff while preparing and maintaining a regulatory engagement plan outlining possible licensing approaches, expected submittals to the NRC, and other aspects of a staged licensing approach for their specific design.

A white paper prepared by the Nuclear Innovation Alliance clarifies the use of a standard design approval within a staged licensing approach to get NRC feedback on major portions of a reactor design. The paper includes discussions of standard design approvals, topical reports, and other vehicles and factors to help reactor designers develop regulatory engagement plans best suited for their technical and financial positions.

Question: How is the NRC preparing to review possible non-light water reactor designs?

Response: The NRC has issued its "Vision and Strategy for Safely Achieving Effective and Efficient Non-Light Water Reactor Mission Readiness" and associated implementation action plans (IAPs). There are six individual strategies addressed in the IAPs. They are

1. Acquire/develop sufficient knowledge, technical skills, and capacity to perform non-LWR regulatory activities.
2. Acquire/develop sufficient computer codes and tools to perform non-LWR regulatory reviews.
3. Establish a flexible non-LWR regulatory review process within the bounds of existing regulations, including the use of conceptual design reviews and staged-review processes. This flexibility will accommodate potential applicants having a range of financial, technical, and regulatory maturity, and a range of application readiness.
4. Facilitate industry codes and standards needed to support the non-LWR life cycle (including fuels and materials).
5. Identify and resolve technology-inclusive (not specific to a particular non-LWR design or category) policy issues that impact regulatory reviews, siting, permitting, and/or licensing of non-LWR nuclear power plants (NPPs) 6. Develop and implement a structured, integrated strategy to communicate with internal and external stakeholders having interests in non-LWR technologies.

The NRC staff is routinely interacting with stakeholders on the activities related to the six strategies. Notices for and summaries of these interactions are provided on the NRC website.

Question: What are regulatory engagement plans and why is the NRC staff emphasizing their importance?

Response: Regulatory engagement plans (previously referred to as licensing project plans) are prepared by reactor developers to help define and manage interactions with the NRC staff. The reactor developer should prepare the regulatory engagement plan considering factors such as:

- What regulatory feedback or decisions are important to developing, financing, and deploying a reactor design?
- What resources are available to support regulatory interactions as well as the underlying research and development?
- What are the relative costs and schedules associated with various forms of regulatory feedback?

The NRC staff will interact with reactor developers and provide insights on the NRC's ability to support a proposed plan as well as the estimated costs and schedules for various elements of a regulatory engagement plan. The plans are important to the NRC staff in their budgeting and planning process. The plans are important to both developers and the NRC staff in that they support the NRC staff and reactor developer reaching agreement on the desired outcomes of defined interactions and estimated costs and schedules for defined reviews. The regulatory engagement plans should pay particular attention to near-term activities needed to support the critical decision process and the development of submittals and NRC review plans. Longer-term licensing and construction strategies for commercial units can be useful to align the licensing

processes with research and development activities, business models, and resolution of associated public policy matters. Uncertainties in these areas need not prevent interactions and progress on near-term activities related to selection of key design alternatives and development of a preliminary design.

Question: Does the NRC propose to prepare new regulations to support non-light water reactor designs?

Response: The NRC's near-term activities involve developing capabilities and guidance to support interactions with reactor developers and potential applications made under existing regulations in Part 50 and Part 52. The use of the existing regulations developed primarily for large light water reactors will require exemptions from some requirements that will not apply to specific non-light water technologies as well as developing new requirements to address technical concerns related to those technologies. An example of how regulatory requirements might be adjusted for non-light-water technologies is provided in the draft advanced reactor design criteria. The NRC is assessing the possible costs and benefits of incorporating a technology-inclusive regulatory framework into NRC regulations (sometimes referred to as Part 53) and has included within the mid-term implementation action plans a decision point on whether or not such a rulemaking is warranted.

In addition to a larger overall framework for non-light-water reactors, the NRC will likely pursue rulemakings in specific areas to support small modular reactors and non-light-water reactor technologies. An example is possible changes to regulatory requirements for emergency preparedness for small modular reactors and other new technologies (see NRC website for additional details).

Question: When a possible owner/operator is looking at sites and designs, where is the regulatory reference and/or description that allows applicants to use the plant parameter envelope (PPE) approach? Part 52.17(a)(1)(i)-(iii); and Part 52.79(b)(1)(2) do not specifically address the PPE approach.

Response: There is not an explicit regulatory reference to an applicant's use of the PPE. The regulation in 10 CFR 52.17(a)(1)(i) requires an applicant for an early site permit (ESP) to describe the specific number, type, and thermal power level of the facilities or range of facilities that the applicant plans to deploy at its proposed site. Although this regulation does not explicitly discuss the PPE approach, the NRC has decided that the PPE approach is an acceptable way of meeting § 52.17(a)(1). See the letter to NEI, dated February 5, 2003, on use of the PPE approach (ADAMS Accession No. ML030230071).

Question: Because the design certification is issued by a rule, instead of a license, certificate or something similar directly back to the applicant/vendor, does that mean that an entity other than the original applicant could amend a certified design, according to Part 52? Similarly, could an entity other than the original applicant for a certified design apply for a renewal of the certified design?

Response: Yes, any person can petition to amend a design certification rule (DCR) under 10 CFR 52.63(a)(1). However, in determining whether to codify a propose amendment, the Commission will give special consideration to comments from applicants or licensees who referenced the DCR. Similarly, an entity other than the original applicant could apply for renewal of a certified design provided that the entity has been qualified as an alternate vendor under 52.73(a).

Question: What was the origin and basis for the 72 hour requirement for light-water reactor passive plants?

Response: One of the principal design requirements from EPRI's advanced light-water reactor (ALWR) utility requirements document (URD) for so-called passive nuclear plants is that passive systems should be able to perform their safety functions, independent of operator action or offsite support, for 72 hours after an initiating event. After 72 hours, non-safety, or active systems may be required to replenish the passive systems or perform core and containment heat removal duties directly. These active systems may be needed to provide defense-in-depth capabilities.

The 72 hour requirement for passive safety systems was developed by the nuclear industry (via EPRI) in the early 1990s and has become a design basis requirement proposed by vendors and approved by the NRC for passive plants. Discussions on the use of the 72 hour requirement for selected safety issues and their approval by the Commission can be found in the following SECY papers and respective SRMs.

SECY-94-084, “Policy and Technical Issues Associated with the Regulatory Treatment of Non-Safety Systems in Passive Plant Designs,” dated March 28, 1994 and the SRM, dated June 30, 1994. Review the discussions on the Regulatory Treatment of Non-Safety Systems, Safe Shutdown Requirements, and Control Room Habitability.

SECY-95-132, “Policy and Technical Issues Associated with the Regulatory Treatment of Non-Safety Systems in Passive Plant Designs,” dated May 22, 1995 and the SRM, dated June 28, 1995. Review the discussions on Safe Shutdown Requirements, the Regulatory Treatment of Non-Safety Systems, and Control Room Habitability.

SECY-96-128, “Policy and Key Technical Issues pertaining to the Westinghouse AP600 Standardized Passive Reactor Design,” dated June 12, 1996 and the SRM, dated January 15, 1997. See discussion on post-72 hour actions where Commission approved the staff’s position that the site be capable of sustaining design basis events with onsite equipment and supplies for the long term (7 days).

Question: Are there high level descriptions of the licensing processes available from the NRC?

Response: The regulatory processes associated with issuing licenses, certifications, and approvals are described in various regulations and guidance documents. A summary is provided in NUREG/BR-0298, "Nuclear Power Plant Licensing Process." A related document with more discussions of the environmental reviews performed to support the siting and construction of nuclear power plants is provided in NUREG/BR-0468, "Frequently Asked Questions about License Applications for New Nuclear Power Reactors."