**IMPROVING ALIGNMENT BETWEEN NEW REACTOR LICENSING PROCESSES**

This enclosure describes issues associated with Commission policy, regulations, and guidance where alignment between the new reactor licensing processes in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," and 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," can be improved. Because of the U.S. Nuclear Regulatory Commission's (NRC's) focus in recent years on the 10 CFR Part 52 licensing process, a number of Commission decisions relative to new reactors have only been translated into explicit requirements and guidance for applicants under 10 CFR Part 52. The staff proposes to apply Commission policies to new 10 CFR Part 50 power reactor license applications in a manner consistent with 10 CFR Part 52 license reviews, including development of new requirements within 10 CFR Part 50 and implementing guidance.

The enclosure is organized as follows:

I. Commission Policies, Direction, and Associated Regulations

II. Application and Review Guidance for 10 CFR Part 50 New Power Reactor Applicants

III. Proposed Implementation Approach

IV. Summary of Recommendations

## I. COMMISSION POLICIES, DIRECTION, AND ASSOCIATED REGULATIONS

The U.S. Nuclear Regulatory Commission (NRC) has put in place several Commission policies and direction to staff on a number of topics related to new reactors since the last 10 CFR Part 50 construction permit (CP) was issued. The NRC staff proposes that these policies and directions be applied to new Part 50 power reactor construction permit and operating license applications, and that the regulations be revised to improve alignment and consistency between the Part 50 and 52 licensing processes. Equivalent designs submitted for NRC review under either process should be assessed against consistent technical standards that yield outcomes with equivalent demonstrations of adequate safety, security, and environmental protection.

### *I.A. Application of Severe Accident Policy and Additional Commission Direction*

On August 8, 1985, the Commission published the "Policy Statement on Severe Reactor Accidents Regarding Future Designs and Existing Plants,"[1] hereafter referred to as the Severe Accident Policy Statement. In this policy statement, the Commission said that it "fully expects that vendors engaged in designing new standard (or custom) plants will achieve a higher standard of severe accident safety performance than their prior designs." The policy statement explained that applicants submitting new designs for NRC approval could address severe accidents acceptably if they did the following:

- Demonstrated compliance with the procedural requirements and criteria of the current Commission regulations, including the Three Mile Island (TMI) requirements described in 10 CFR 50.34(f);

- Demonstrated technical resolution of all applicable Unresolved Safety Issues and the medium- and high-priority Generic Safety Issues, including a special focus on assuring the reliability of decay heat removal systems and the reliability of electrical supply systems;

- Completed a Probabilistic Risk Assessment (PRA) and consideration of the severe accident vulnerabilities the PRA exposes along with the insights that it may add to the assurance of no undue risk to public health and safety; and

- Completed a staff review of the design with a conclusion of safety acceptability using an approach that stresses deterministic engineering analysis and judgment complemented by PRA.

The policy statement indicated that to complete these steps, applicants are expected to consider a range of alternatives in addressing safety issues and reducing risk from severe accidents. NRC staff conclusions on the acceptability of the design would be made through a review of the applicant's traditional engineering analysis, complemented by insights from the PRA.

[1] "Policy Statement on Severe Reactor Accidents Regarding Future Designs and Existing Plants,"50 FR 32138, August 8, 1985.

The policy statement discusses criteria for different types of construction permit and operating license (OL) applications, and addresses inclusion of PRA information for a preliminary design, stating:

> …if this risk analysis is not performed in the PDA [preliminary design approval, which is a predecessor to the current design certification approach] process, it will have to be provided as part of any CP [construction permit] application referencing the design.

Therefore, the policy statement sets an expectation that construction permit applications include a preliminary risk analysis. The regulations in 10 CFR 52.47(a)(27) and 10 CFR 52.79(a)(46) implement this expectation by requiring submittal of PRA information in design certification (DC) and combined license (COL) applications, respectively. Similarly, 10 CFR 52.47(a)(8) and 10 CFR 52.79(a)(17) include requirements to address TMI issues for those applications. However, these expectations have not been reflected in requirements for new construction permit or operating license applications in 10 CFR Part 50.

The NRC staff completed several Commission papers in the late 1980s and early 1990s addressing issues arising from consideration of new reactor design and licensing reviews. In SECY-89-013, "Design Requirements Related to the Evolutionary Advanced Light Water Reactors," dated January 19, 1989,[2] the staff informed the Commission of the planned approach to ongoing reviews of evolutionary new reactor designs, and identified issues that should be resolved for these designs.

A year later, in SECY-90-016, "Evolutionary Light Water Reactor (LWR) Certification Issues and Their Relationship to Current Regulatory Requirements," dated January 12, 1990,[3] the staff recommended positions on a number of issues fundamental to review of evolutionary designs. The Commission approved most of these enhancements in its June 26, 1990, staff requirements memorandum (SRM).[4]

As the NRC began to review passive designs, the staff requested Commission direction on extending certain requirements to these types of designs, as well as direction on additional enhancements, in SECY-93-087, "Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor (ALWR) Designs," dated April 2, 1993.[5] In its SRM dated July 21, 1993,[6] the Commission extended a number of its previous positions to passive designs. The Commission also approved new positions on topics such as leak before break and steam generator tube ruptures (SGTRs).

These expectations from the Severe Accident Policy Statement and Commission direction outlined above have been incorporated into requirements and guidance for new reactor applications reviewed under the provisions of 10 CFR Part 52. However, regulations and guidance supporting new 10 CFR Part 50 applications have not been consistently updated to reflect these Commission positions. Therefore, the NRC staff requests that the Commission

[2] Agencywide Documents Access and Management System (ADAMS) Accession No. ML003707947.
[3] ADAMS Accession No. ML003707849.
[4] ADAMS Accession No. ML051800192.
[5] ADAMS Accession No. ML003708021.
[6] ADAMS Accession No. ML051800806.

confirm that the NRC staff should apply the Severe Accident Policy Statement and other Commission direction to new 10 CFR Part 50 power reactor applications in a manner consistent with 10 CFR Part 52 design and license applications. The NRC staff proposes that the regulations in 10 CFR Part 50 be updated to provide demonstrably technically equivalent outcomes to license reviews conducted under 10 CFR Part 52.

Additional detail regarding specific issues that need to be addressed is provided below.

*I.B. TMI Requirements*

The criteria used to assess resolution of severe-accident issues for new reactors also include certain post-TMI requirements in 10 CFR 50.34(f).

The introductory paragraph of 10 CFR 50.34(f) limits its applicability to two groups of applicants:

- Applicants for a CP or manufacturing license whose application was pending as of February 16, 1982, all of whom no longer have active applications; and

- Applicants for a DC, design approval, COL, or manufacturing license under 10 CFR Part 52, with certain exceptions described in 10 CFR Part 52.

Therefore, new CP and OL applicants under 10 CFR Part 50 are not currently required to comply with the TMI items in 10 CFR 50.34(f).

Requirements in 10 CFR Part 52 for the contents of design certification and combined license applications (10 CFR Part 52.47(a)(8) and 10 CFR 52.79(a)(17), respectively) state that these applications must provide information necessary to demonstrate compliance with the technically relevant portions of the TMI requirements, with certain exceptions.

Given the broad applicability of the policy statement on severe accidents, the staff recommends that the TMI requirements in 10 CFR 50.34(f) be revised via rulemaking to apply to new power reactor applications submitted under 10 CFR Part 50, with the same exceptions given for 10 CFR Part 52 applicants.

*I.C. PRA Requirements*

One of the four fundamental criteria used to assess resolution of severe-accident issues for new reactors is the performance of a PRA. For new reactor applicants under 10 CFR Part 52, PRAs are addressed in three separate sets of requirements:

1) 10 CFR 50.34(f)(1)(i), which directs applicants to perform “a plant/site specific [PRA], the aim of which is to seek such improvements in the reliability of core and containment heat removal systems as are significant and practical and do not impact excessively on the plant.” As noted above, the requirements of 10 CFR 50.34(f) do not presently apply to new CP or OL applications.

2) 10 CFR 52.47(a)(27) and 10 CFR 52.79(a)(46), which direct DC and COL applicants, respectively, to provide a description of the design-specific or plant-specific PRA and its results.

3) 10 CFR 50.71(h), which directs only COL holders to develop, maintain, and upgrade a PRA with a specific scope.

Presently, these requirements do not apply to new reactor license applications submitted under 10 CFR Part 50. Given the broad applicability of the policy statement on severe accidents, the staff recommends that the requirements to develop, maintain, and upgrade a PRA, as well as to submit a description of the PRA and its results, be applied to all new power reactor applications. The staff expects the PRA to address both internal and external events, consistent with the Commission-approved recommendations of SECY-93-087.

The staff recommends conducting rulemaking to set PRA requirements for new applicants under 10 CFR Part 50, as discussed in the implementation section below.

*I.D. Other Severe Accident Requirements*

As discussed above, in the policy statement on severe accidents, the Commission stated that it "expects that vendors engaged in designing new standard (or custom) plants will achieve a higher standard of severe accident safety performance than their prior designs." The four fundamental criteria given in the policy statement that are used to assess resolution of severe accident issues for new reactors also include the completion of a PRA with consideration of severe accident vulnerabilities. These policy decisions were translated into positions on specific technical issues through the SRMs on SECY-90-016 and SECY-93-087. Examples of these issues include expectations to limit core-concrete reactions, maintain containment integrity, control hydrogen generation, and prevent intersystem loss-of-coolant accidents.

For new reactor applicants under 10 CFR Part 52, severe accidents are addressed in 10 CFR 52.47(a)(23) and 10 CFR 52.79(a)(38), which require DC and COL applicants, respectively, to provide a description and analysis of design features for the prevention and mitigation of severe accidents, including challenges to containment integrity caused by core concrete interaction, steam explosion, high-pressure core melt ejection, hydrogen combustion, and containment bypass. However, for new reactor applicants under 10 CFR Part 50, the regulations do not include analogous criteria.

Given the broad applicability of the policy statement on severe accidents and the positions in the SRMs on SECY-90-016 and SECY-93-087, the staff recommends that the requirements to provide descriptions and analyses of design features for the prevention and mitigation of severe accidents should apply to all new reactors.

In order to address severe accidents for new Part 50 power reactor applications in a manner consistent with Part 52 design and licensing reviews, the NRC staff recommends that 10 CFR Part 50 be revised to provide requirements analogous to 10 CFR 52.47(a)(23) and 10 CFR 52.79(a)(38) to provide descriptions of severe accident design features. Construction

permit applications should provide preliminary information in a manner similar to other preliminary safety analysis report (PSAR) content, while operating license applications should provide information sufficient to support a final licensing decision equivalent to a combined license.

*I.E. Other Application Content Requirements*

In the SRMs for SECY-90-016 and SECY-93-087, the Commission approved positions regarding anticipated transients without scram (ATWS), station blackout (SBO), and fire protection for all evolutionary and passive ALWRs. Requirements for specific information to be submitted in applications, however, are limited to the 10 CFR Part 52 process. Only COL applicants are required to provide a description and analysis of their fire protection design features (Section 52.79(a)(6)). COL applicants are also required to describe their fire protection plan in their applications per 10 CFR 52.79(a)(40). Similarly, a design certification applicant is required to address ATWS and SBO per the requirements of 10 CFR 52.47(16) and 10 CFR 52.47(17), respectively. Presently, the regulations of 10 CFR 50.34(b) describing the content of operating license applications do not include similar requirements.

Given the broad applicability of the positions on ATWS, SBO, and fire protection in the SRMs on SECY-90-016 and SECY-93-087, the staff recommends that rulemaking be conducted to require new 10 CFR Part 50 power reactor applications to provide information on these topics in a manner consistent with 10 CFR Part 52 applications, as discussed in the implementation section below. The proposed changes will improve the clarity, consistency, and alignment of new reactor licensing requirements between 10 CFR Parts 50 and 52.

*I.F. Policy for Consideration of Multiple Steam Generator Tube Ruptures*

In the SRM for SECY-93-087, the Commission approved the staff's recommendation to assess the effects of multiple steam generator tube ruptures (SGTRs) in advanced passive pressurized water reactors (PWRs) design certification reviews, using realistic or best estimate analytical assumptions. These evaluations have been incorporated into NRC regulations via design certification rulemaking, when appropriate.

The staff requests that the Commission confirm that a similar approach should be applied in the licensing review of advanced passive PWRs conducted under 10 CFR Part 50. The Commission's position on evaluation of multiple SGTRs is not explicitly addressed in the application requirements of 10 CFR Part 52 or in 10 CFR Part 50 technical requirements. If the Commission approves the staff's proposal, the staff will develop a rule requiring evaluation of multiple SGTRs for passive PWRs, regardless of whether the application is made under 10 CFR Part 50 or 10 CFR Part 52.

## II. APPLICATION AND REVIEW GUIDANCE FOR 10 CFR PART 50 NEW POWER REACTOR APPLICANTS

The staff plans to complete a number of activities to ensure that consistent guidance is available for all new reactor applicants and NRC staff, regardless of whether the application is submitted under 10 CFR Part 50 or 10 CFR Part 52. Guidance such as NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," has not been consistently updated since the early 1980s to address new 10 CFR Part 50 reactor applications. Recent guidance updates have focused on 10 CFR Part 52 licensing, and so may not be sufficient for construction permit reviews. Therefore, the NRC staff plans to review this guidance to determine what changes are needed to support review of new construction permit and operating license applications. This effort will ensure guidance for review of new 10 CFR Part 50 applications will be consistent with current regulatory standards and Commission policies and directions, including Commission decisions made in response to this paper.

The discussion below highlights issues where the NRC staff believes particular attention will be required for topics that have not been addressed in previous Part 50 licensing reviews. Commission feedback and direction regarding guidance development for these topics is not requested at this time. However, Commission guidance will be sought if significant issues are identified as guidance development proceeds.

### *II.A. Severe Accidents Mitigation Alternatives for Construction Permit Environmental Impact Statements*

The NRC has not issued a power reactor construction permit (CP) since the late 1970s. Since that time, requirements governing the scope of environmental issues to be addressed in a CP environmental impact statement have evolved. A court decision[7] associated with NRC review of the Limerick operating license application prompted the NRC to address severe accident mitigation alternatives (SAMA) in the agency's environmental impact statements (EIS). Subsequent to that decision, the NRC has included a SAMA analysis in its EISs for operating license and license renewal reviews. However, the NRC has never issued an EIS containing a SAMA analysis for a CP application review; no CP application has been submitted since the *Limerick* decision. As a result, there are only limited practical examples and guidance regarding how the SAMA analysis should be addressed in a CP application and, subsequently, in the NRC staff's EIS.

Presently, the NRC staff is unaware of specific plans for a CP application, so no action is planned in the near term. The staff needs a better understanding of specific reactor design concepts and potential licensing scenarios before the technical and policy challenges associated with SAMA review of CP applications can be assessed. The staff will seek Commission guidance, if necessary, once a specific project is identified.

[7] *Limerick Ecology Action Inc. v. NRC*, 869 F.2d 719 (3d Cir. 1989).

*II.B. Mitigative Strategies and Response Procedures (10 CFR 50.54(hh))*

The NRC staff plans to develop guidance for the content of CP and OL applications, and for staff review of mitigative strategies and response procedures submitted in accordance with the requirements of 10 CFR 50.54(hh), as described below.

In 2009, the NRC issued regulations requiring licensees to develop mitigative strategies and procedures to respond to potential or actual aircraft attacks (10 CFR 50.54(hh)) as part of the Power Reactor Security Requirements.[8] The NRC staff has not yet addressed these topics for a new 10 CFR 50 construction permit or operating license application, and needs to develop guidance to address these requirements.

The Statements of Consideration (SOC) for rules implementing the Power Reactor Security Requirements (which includes 10 CFR 50.54(hh)) states that:

> The Commission views the mitigative strategies as similar to those operational programs for which a description of the program is provided and reviewed by the Commission as part of the combined license application and subsequently the more detailed procedures are implemented by the applicant and inspected by the NRC before plant operation. Because the Commission finds that the most effective approach is for the mitigative strategies, at least at the programmatic level, to be developed before construction and reviewed and approved during licensing, a requirement for information has been added to § 52.80, ''Contents of applications; additional technical information,'' and § 50.34, ''Contents of construction permit and operating license applications; technical information.''[9]

Under the 10 CFR Part 50 process, a prospective nuclear power plant operator applies first for a CP, and then for an OL. The requirements in 10 CFR 50.34(a) outline the information applicants must submit in a PSAR to support the NRC staff's safety review and issuance of a CP. A CP can be issued based on NRC's acceptance of the proposed site and preliminary facility design, as stated in 10 CFR 50.35, "Issuance of construction permits." A CP can be issued leaving some technical or design details for later consideration. The process for issuance of a CP includes an uncontested hearing.

If a CP is issued and construction proceeds, an OL application is submitted, including a final safety analysis report (FSAR), with the content specified by 10 CFR 50.34(b). The FSAR describes the licensing basis that is reviewed by the NRC staff to develop the agency's safety evaluation report. An opportunity for a hearing is provided during an OL review.

The requirements of 10 CFR 50.54(hh) have not been applied to new 10 CFR Part 50 license applications. The process to address this requirement in new CP and OL applications is outlined below.

The requirements of 10 CFR 50.54(hh)(1) state that "Each licensee shall develop, implement and maintain procedures that describe how the licensee will address the following areas if the

[8] 74 FR 13926, March 27, 2009.
[9] See 74 FR 13933, March 27, 2009.

licensee is notified of a potential aircraft threat," followed by a list of actions the licensee must address. Consistent with the text of the SOC cited above, the NRC staff plans to review preliminary information to address this requirement as part of its evaluation of a CP application. Compliance with this requirement will be verified as part of the review and inspection prior to issuance of the OL.

The requirements of 10 CFR 50.34(i) state that CP and OL applications must also provide "a description and plans for implementation of the guidance and strategies intended to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities under the circumstances associated with the loss of large areas of the plant due to explosions or fire as required by § 50.54(hh)(2) of this chapter." Neither 10 CFR 50.34(i) or 10 CFR 50.54(hh)(2) differentiate between the content required for a CP versus an OL application.

Based on the expectations described in the SOC quoted above and consistent with other topics addressed in the PSAR, the NRC staff plans to review preliminary information regarding programmatic compliance with 10 CFR 50.54(hh)(2) as part of the NRC staff's review of a CP application. A decision on the acceptability of the final design with regard to 10 CFR 50.54(hh)(2) will be made as part of the NRC staff's review of the OL application based on final design information and inspection of implementing procedures.

Per the discussion above, guidance will be developed to inform stakeholders of NRC staff's expectations for the level of information to be provided in CP and OL applications, and for the standards to be applied to NRC staff review of those applications in order to ensure compliance with the requirements of 10 CFR 50.54(hh). This guidance will reflect any rule changes which may arise from the staff's ongoing effort to incorporate elements of the mitigating strategies into the regulations.

*II.C. Aircraft Impact Assessment (10 CFR 50.150)*

The NRC staff plans to develop guidance for the content of CP and OL applications, and for staff review of information regarding aircraft impact assessment submitted in accordance with the requirements of 10 CFR 50.150, "Aircraft impact assessment," as described below. Guidance will also be developed to address how changes to information originally provided in the completed PSAR should be addressed by CP holders.

In 2009, NRC issued requirements in 10 CFR 50.150 that new reactor design certification and certain license applicants must evaluate effects of postulated aircraft impacts.[10] Per the requirements of 10 CFR 50.150(a), new CP and OL applicants must assess the effects of the beyond design basis impact of a large commercial aircraft. While the requirements of 10 CFR 50.150(a) are identical for a CP or OL application, the SOC for this rule states:

> The NRC is applying the final rule to applicants at both the construction permit and operating license stages because it is not until the operating license stage that the applicant is required to provide the NRC with its final design. The NRC can issue a construction permit based on preliminary design information. Therefore, the NRC believes it is necessary to require applicants to perform the aircraft impact assessment

[10] 74 FR 28112, June 12, 2009.

> at both stages and to include the required information in both applications based on the level of design information available at the time of each application.[11]

Requirements for the content of the CP PSAR to address this topic are in 10 CFR 50.34(a)(13), while OL FSAR content is addressed in 10 CFR 50.34(b)(12). While the text of 10 CFR 50.150(a) does not distinguish between the content of a CP and an OL application, the SOC and the requirements of 10 CFR 50.34, "Contents of applications: technical information," make it clear that a different level of detail may be provided in the two applications. Accordingly, the NRC staff will develop guidance for the content of CP and OL applications regarding aircraft impact assessment, along with guidance for the staff review of such applications.

The aircraft impact assessment regulations also include requirements for control of changes to this assessment, as described in 10 CFR 50.150(c). This regulation requires that if a CP holder changes aircraft impact assessment information required in the PSAR, the effect of those changes will be evaluated and the PSAR amended as needed to demonstrate continued compliance with 10 CFR 50.150(a)(1).

The NRC staff notes that when construction permits for existing plants were issued, the PSARs for those facilities were considered complete. Changes to the plant design were described as part of the FSAR submitted in accordance with the requirements of 10 CFR 50.34(b), and assessed as part of the NRC staff's evaluation of the operating license application. The NRC staff is unaware of any precedent for revising a PSAR after issuance of a construction permit. Therefore, guidance needs to be developed for CP holders on how such changes should be evaluated, including the threshold for revising the PSAR, and on how the NRC staff will review and process any PSAR changes. Issues which could arise as this guidance is developed include determination of circumstances where the PSAR change constitutes an amendment to the CP. The NRC staff will seek Commission direction on any policy issues which may arise as this guidance is developed.

*II.D. Reliability Assurance Program*

In SECY-89-013, the staff introduced the concept of a reliability assurance program (RAP), since decisions on DCs would be based in part on PRA results that depend on the reliability of systems, structures, and components (SSCs). In the SRM on SECY-94-084, the Commission approved the following purpose for RAP:

> [RAP provides] reasonable assurance that (1) an ALWR is designed, constructed, and operated in a manner that is consistent with the assumptions and risk insights for these risk-significant SSCs, (2) the risk-significant SSCs do not degrade to an unacceptable level during plant operations, (3) the frequency of transients that challenge ALWR SSCs are minimized, and (4) these SSCs function reliably when challenged.

In SECY-95-132, "Policy and Technical Issues Associated with the Regulatory Treatment of Non-Safety Systems in Passive Plant Designs (SECY-94-084)," May 22, 1995,[12] the staff proposed specific requirements related to RAP for DCs (to be incorporated into the DC

[11] 74 FR 28115, June 12, 2009.
[12] ADAMS Accession No. ML003708005.

rulemaking) and COLs (to be adopted when designs are referenced), and the Commission approved these positions. Although the Commission-approved purpose for RAP is stated generically in terms of ALWRs, the implementation of RAP requirements has been structured around the 10 CFR Part 52 DC and COL processes.

The staff expects that design aspects of the RAP would be assessed as part of the OL review of the applicant's PRA, assuming that the proposed rulemaking to align 10 CFR Parts 50 and 52 proceeds. This effort should ensure that the design, procurement, and construction of plant systems, structures, and components are consistent with the characteristics assumed in the risk analyses. If an operating license is issued, RAP will be based upon implementation of programs that ensure compliance with NRC quality assurance and maintenance regulations. This approach is consistent with that envisioned for COLs.

The staff will review guidance for operating license reviews to determine if changes are needed to implement this approach for 10 CFR Part 50 applications.

*II.E. Applicability of Interim Staff Guidance*

Since 2008, the staff has issued a number of Interim Staff Guidance (ISG) documents to clarify staff positions relative to new reactor reviews, covering topics such as technical specifications, PRA, gas accumulation, and seismic issues. As discussed previously, since recent licensing activities have focused on the 10 CFR Part 52 process, these ISGs for new reactors all include "DC" and/or "COL" in their identifiers, implying a limitation to 10 CFR Part 52 applications. In addition, nearly all of the ISGs include an applicability statement that refers to applications submitted under 10 CFR Part 52 (phrased various ways). The four ISGs without such a statement all refer to DC and COL applications in their purpose sections and not to 10 CFR Part 50 applications. In addition, ISG-4, "Interim Staff Guidance on the Definition of Construction and on Limited Work Authorizations," dated February 2009, explicitly states that it does not address CP applications, but only applications submitted under 10 CFR Part 52.

To address these potential inconsistencies, the staff intends to update guidance to clarify which ISG material is applicable to new reactor applications under 10 CFR Part 50. Eventually, ISGs associated with new reactor licensing reviews will be incorporated into other staff guidance, such as the SRP, and retired.

*II.F. Regulatory Treatment of Non-Safety Systems*

To date, passive advanced light water reactor (ALWR) designs have included active, non-safety-related systems that provide defense-in-depth capabilities for reactor coolant makeup and decay heat removal. To provide confidence that these active systems that have a significant safety role will be available when challenged, the NRC developed an approach termed "regulatory treatment of non-safety systems" (RTNSS). RTNSS is not a regulatory requirement in either 10 CFR Part 50 or Part 52, but the discussion of RTNSS in SECY-94-084, "Policy and Technical Issues Associated with the Regulatory Treatment of Non-Safety Systems in Passive Plant Designs," March 28, 1994,[13] generally describes issues in the context of passive ALWRs rather than the 10 CFR Part 52 process. The Commission-approved

[13] ADAMS Accession No. ML003708068.

discussion of RTNSS, however, links to the 10 CFR Part 52 process when discussing testing requirements in 10 CFR 52.47, "Contents of applications; technical information," actions performed by the "designer," and the development of a Level 3 PRA.

To address these potential inconsistencies, the staff intends to update guidance to clarify that the Commission-approved RTNSS process applies to all passive new reactor designs.

*II.G. Information on Required Operational Programs*

For COL applicants, 10 CFR 52.79(a) requires descriptions of various operational programs, including environmental qualification, American Society of Mechanical Engineers code, containment leakage testing, vessel surveillance, maintenance rule, operator training, radiation protection, fire protection, and fitness for duty. Applicants under 10 CFR Part 50 are required to have these programs, but the application-requirements portion of Part 50 does not explicitly require most of the program descriptions that Part 52 does. In some cases, this apparent inconsistency results from the different timing of the two regulatory approaches: program descriptions that may be needed to approve a one-step COL may not be needed at the CP stage for programs that will be in place at the OL stage.

To address these potential inconsistencies, the staff intends to review and update its guidance as needed to address descriptions of required operational programs required to support the staff's findings related to CPs or OLs.

*II.H. Resolution of Safety Issues and Use of Operating Experience*

Another of the four fundamental criteria used to assess resolution of severe-accident issues for new reactors is that applicants will demonstrate technical resolution of all applicable unresolved safety issues (USIs) and medium- and high-priority generic safety issues (GSIs). This criterion has been translated into requirements for DC and COL applicants (10 CFR 52.47(a)(21) and 10 CFR 52.79(a)(20), respectively). DC applicants must also demonstrate how operating experience has been incorporated in the design (10 CFR 52.47(a)(22)).

While Part 50 does not contain regulations identical to 10 CFR 52.47(a)(21), 52.47(a)(22), or 52.79(a)(20), legal precedents establish that applicants under 10 CFR Part 50 must demonstrate the resolution of USIs and GSIs prior to issuance of an OL. In accordance with the requirements in 10 CFR 50.34 and 10 CFR 50.35, a CP applicant must demonstrate by a sufficient level of information that all safety issues are capable of being resolved or otherwise addressed prior to issuance of an operating license. Specifically, the ruling of the Atomic Safety and Licensing Appeal Board (ALAB) in Long Island Lighting Company (Shoreham Nuclear Power Station Unit 1) ALAB-788, 20 NRC 1102 (1984) provides the basis for this position.

The 2007 revision to the SRP incorporates USIs, GSIs, and operating experience from generic letters and bulletins that were current at the time. In addition, SRP Section 1.0 indicates that the applicant, including applicants for CPs, should provide a table identifying resolution of new USIs, GSIs, and operating experience issued after the latest SRP revision.

Despite the different approaches for applications under 10 CFR Part 50 and Part 52, the staff concludes that sufficient guidance is available for all new reactor applicants relative to these topics, and no further action is needed to address USIs, GSIs, and operating experience.

## III. PROPOSED IMPLEMENTATION APPROACH

To fully implement the requested Commission decisions described above and to improve the alignment between the two new reactor licensing processes, the NRC staff proposes to conduct rulemaking to update the 10 CFR Part 50 new reactor licensing regulations. The NRC staff believes that updating the regulations is the most effective approach to ensuring demonstrably equivalent technical review standards are applied to new reactor license reviews, regardless of whether an application is made under either 10 CFR Part 50 or 10 CFR Part 52. The rulemaking process ensures the greatest degree of public participation in establishing the new requirements, and provides greater clarity regarding the standards and processes to be applied to a new 10 CFR Part 50 license application. Setting clear expectations via the NRC's regulations helps those organizations considering new reactor license applications to make well-informed decisions regarding which licensing process is best suited to their specific business needs. A clear regulatory process also helps members of the public understand how they can monitor and participate in licensing decisions that may affect their interests.

The NRC staff considered whether the existing regulations provide adequate tools to address differences between 10 CFR Parts 50 and 52 without additional regulatory changes, but have concluded alternatives to rulemaking are problematic. The requirements of 10 CFR 50.50, "Issuance of licenses and construction permits," state that a license will be issued upon the NRC's determination that the application meets the standards and requirements of the Atomic Energy Act of 1954 and the regulations. Therefore, if an application otherwise meets the requirements of 10 CFR Part 50, it is legally problematic for the staff to impose additional requirements via an order or license condition, without a clear nexus to a 10 CFR Part 50 regulation.

Imposing additional requirements also arguably constitutes de facto rulemaking, without following a rulemaking process, such as providing an appropriate opportunity for stakeholder interactions. When orders were issued after the events of September 11, 2001, to impose additional security requirements, the NRC was sued by Public Citizen, who claimed that the NRC was illegally imposing new requirements via order, rather than rulemaking. This lawsuit[14] was held in abeyance when the NRC stated that it was engaging in rulemaking, and it was ultimately dismissed as moot when the rulemaking on the design basis threat rule occurred. In this case, there is no exigent issue which requires an immediate response on the part of the agency. The Part 52 requirements that do not apply to Part 50 applicants are not new issues; rather, they simply have not been applied to Part 50 applicants. Thus, there is no circumstance warranting imposition of new requirements via a mechanism other than rulemaking.

Therefore, the staff concludes that, with respect to the already-existing requirements for 10 CFR Part 52, imposing these additional requirements on new 10 CFR Part 50 power reactor applications via order or license condition is not a practical alternative.

This is not to say, however that the NRC cannot impose additional requirements on applicants when the applicants are proposing a new technology that is not covered by the regulations. For example, 10 CFR 50.43(e) specifically contemplates additional criteria for innovative designs.

[14] *Public Citizen v. NRC*, No. 03-11851, 2007 U.S. App. LEXIS 8641 (D.C. Cir. April 11, 2007).

However, this paper is not identifying additional criteria for innovative designs. Rather, it is identifying long standing existing criteria that do not currently apply to a new Part 50 applicant.

The staff also acknowledges the option to leave the 10 CFR Part 50 new reactor licensing process as-is, without taking steps to align that process with 10 CFR Part 52 requirements. This option is unsatisfactory, as it would create the possibility of different outcomes, dependent not upon differences in the design of a particular reactor, but solely upon the regulatory process used to license it. For example, the NRC staff would not have risk or severe accident information available to inform its licensing decision; even if an applicant voluntarily provides such information, the staff's ability to include that information in its review would be adversely affected without clear policy guidance and appropriate regulatory controls.

The Commission and other stakeholders will be informed of details of specific proposed rule changes in accordance with the NRC's standard rulemaking practices, including opportunities for public comment.

## IV. SUMMARY OF RECOMMENDATIONS

Per the discussion above, the NRC staff recommends that the Commission:

1. Confirm that the Commission's guidance given in the "Policy Statement on Severe Reactor Accidents Regarding Future Designs and Existing Plants" and other Commission direction provided in response to SECY-89-013, SECY-90-016, and SECY-93-087, apply to new 10 CFR Part 50 power reactor applications in a manner consistent with 10 CFR Part 52 design and license applications.

2. Direct the NRC staff to revise the regulations in 10 CFR Part 50 for new power reactor applications to more closely align with requirements in 10 CFR Part 52, incorporating requirements as follows:

    a. Develop a plant-specific PRA, submit appropriate information describing that analysis as part of the CP and OL submittals, and maintain and upgrade the PRA throughout the duration of the operating license.
    b. Address the TMI requirements of 10 CFR 50.34(f), with the same exceptions given for 10 CFR Part 52 applications.
    c. Provide a description of design features for prevention and mitigation of severe accidents.
    d. Provide a description and analyses of fire protection design features and describe fire protection plans.