

## DETAILED DESCRIPTION OF RESEARCH AND TEST REACTOR LICENSE RENEWAL STREAMLINING OPTIONS THE STAFF HAS CONSIDERED

### Alternate Safety Review Approach

One approach the Nuclear Regulatory Commission (NRC) staff has considered for streamlining the research and test reactor (RTR) license renewal process would be to adopt an alternate safety review. The basic premise of the alternate safety review is that the previously granted license was granted with due diligence and that the plants have operated safely during their previously licensed term. Therefore, the alternate safety review would not re-analyze those items that were approved when granting the previous license. The scope of the review would be all of the changes to the facility since it was last licensed including, but not limited to, physical modifications, and license modifications. The review would also ensure that the proposed renewed licenses meet the requirements of all changes to the regulations since the last license was issued.

The alternate safety review approach would not reanalyze those items the staff has previously reviewed and approved. Therefore, safe operation of the facility would be assured by; the review of the changes to the facility, compliance with the current regulations, the previous NRC analysis, and the inspection process.

This process would require the licensee to submit a summary of the changes to the facility since it was last licensed or renewed. The NRC staff would review the changes and verify the plant configuration during site visits.

### *Steps to Implement Alternate Safety Review Approach*

The NRC staff would need to develop a rule to incorporate this approach into the Commission's regulations and develop format and content guidance documents for the licensee and a standard review plan for the NRC staff. The guidance document would include guidance for the licensee on information required to be submitted. The guidance for the staff would include instructions for the site audit, a time line of the relevant changes to the regulations, and what would be in the scope of the review. The updated guidance would be noticed for public comment prior to implementation.

### *Steps in the Alternate Safety Review Approach*

The licensee would submit an application for renewal that would include a discussion of changes to the facility since it was last licensed. For those applications already on the docket, the licensee would amend those applications to include the changes to the facility. The staff would review the changes that the licensee submitted and conduct an on-site visit to review the current plant configuration. Additionally, the proposed license would be reviewed for compliance to any changes in the regulations since the issuance of the previous license.

The review of the application would be noticed in the Federal Register similar to the current process. The safety evaluation accompanying the approved license would explicitly state those areas that were reviewed.

### *Advantages of the Alternate Safety Review*

The alternate safety review would save the staff and licensee effort on items that have been previously reviewed and approved by the NRC. The approach has similarities to that used for power reactors.

### *Disadvantages of the Alternate Safety Review*

The approach is based on the premise that the existing license does not contain any deficiencies important to safety. As shown in the examples in Enclosure 2, the potential may exist for safety analysis reports (SARs) to contain errors that could be safety significant. There is no way to predict which applications would have issues brought to light by a traditional review. The staff would not pursue non-regulation based enhancements to the licensing basis (e.g., evaluating potential pool leakage to show safety significance) or updates to technical specifications (TSs). Licensees that have submitted renewal applications would be asked to amend the applications, which may involve more resources than finishing the application already on the docket. The public could raise questions or find errors in applications on the docket that would not be reviewed by the staff.

### Graded Approach

Because of the variety of RTR designs and power levels the risks associated with the operation of an RTR can vary considerably. A potential means of streamlining the review would be to base the areas of review on the relative risk associated with the renewed license. Those facilities that present the least risk would be subject to a minimal review for renewal of the license. Those that present a moderate risk would receive a more rigorous review, and finally those facilities with the highest risk would require a complete review similar to what is currently accomplished for all licensees.

The graded approach would ensure safe operation of the facility by properly identifying the inherent risk associated with the various facilities and ensuring those risks are minimized.

The staff must develop the technical, regulatory and policy bases to support this option. If this option is imposed by regulation, then the bases must be covered in the rulemaking's statement of considerations. It may well be that this option cannot or should not be initiated until it has been incorporated into a regulation, or, at the very least, published for comment, since it is a change in a long standing process that will require amendment of the SRP and other guidance.

### *Steps to Implement Graded Approach*

The first step to implement the graded approach would be to develop the guidelines for how to classify each reactor and the proper review for each classification. Once the guidelines are determined, guidance documents for each level of review must be developed for both the licensee and the staff. The guidance documents would then be noticed for public comment.

### *Steps in the Graded Approach*

The staff would apply the appropriate review criterion for the reactor. The renewal applications would be noticed in the Federal Register prior to issuance.

### *Advantages of the Graded Approach*

The major advantage to the graded approach is that it would adhere to the regulatory requirement of minimal regulation for non-power reactors by only reviewing items that are necessary to ensure safe operation of the facility for the extended life of the license. The graded approach would save the staff and licensee effort on items not important to safety.

### *Disadvantages of the Graded Approach*

As with any narrowing of the scope of review for license renewal, the potential exists for licenses to be issued that contain errors. However, proper adoption of the graded approach would result in any errors that remain in the license to be items not important to safety.

A potential issue with adopting the graded approach would be determining the risk of extending the license because probabilistic risk assessments (PRAs) have not been accomplished for any of the non power reactors. The staff would need to establish that areas not subject to review are not significant to safety. Therefore, adopting the graded approach could take considerable time and effort for the staff.

Another disadvantage of the graded approach is that its implementation could be lengthy as it may require rulemaking.

### Generic Analysis Approach

The generic analysis approach would be similar to the NRC's Topical Report process. The NRC would review and approve a generic design for a reactor design (e.g. Aerojet General Nucleonics design). The licensees with a similar design would confirm that they are bounded by the generic analysis (for those portions of the license where the generic analysis is bounding). The NRC has had some generic accident analyses performed in the past (e.g., NUREG/CR-2198, "Fuel Temperatures in an Argonaut Reactor Core Following a Hypothetical Design Basis Accident").

### *Advantages of the Generic Analysis Approach*

The advantage of the generic analysis is that once the initial work is completed to develop the guidance, it would save considerable time for both the licensee and staff on items that are similar for several licensees. The licensees would save time by referring to the generic analysis where applicable thereby streamlining the application process. The NRC staff will save time by relying on the previously approved generic analysis where applicable and not reanalyzing those items for each licensee. The generic analysis would also save effort for both the licensees and the NRC staff by eliminating some requests for additional information (RAIs).

The licensed facilities that have provided feedback on the renewal process have stated that generic analysis for the various designs would be very beneficial and could be relatively easy to develop.

#### *Disadvantages of the Generic Analysis Approach*

The disadvantage of the generic analysis approach is the initial burden of developing the generic analysis and the variety of RTR designs. The RTR inventory has several designs that have limited application. For these designs a generic analysis would likely not be worth the initial investment. Also, the RTR licensees may not have the expendable budget to develop the necessary application.

#### Generic Siting Analysis

A portion of the application submitted by the licensee is information related to the site of the facility. The license renewal application contains, for example, local climatology and seismology. Currently, many licensees have to spend considerable time gathering the necessary data. The NRC staff has considered developing a generic communication that contains this information for each of the sites which the licensees could then reference in their submittals. The licensee would still make the case to the NRC that the site continues to be acceptable based on the data. The NRC would then periodically update the generic communication for future use.

#### *Advantages of the Generic Siting Analysis*

The generic siting analysis would ease the burden on the licensee when applying for license renewal. The generic siting analysis would eliminate requests for information related to the site of the facility.

#### *Disadvantages of the Generic Siting Analysis*

The generic siting analysis would expend NRC resources both for the initial development of the generic communication and with subsequent revisions.

Also, the NRC funding to develop the generic siting analysis may run afoul of administrative regulations and appropriations law prohibitions that prevent the agency from funding or undertaking certain activities that are required to be performed by licensees. The answer to that question will require additional information and research. However, if the siting surveys are for the purpose of meeting the agency's own official needs then such funded effort would be permissible.

#### Extended License Term

10 CFR 50.51(a) states that "[e]ach license will be issued for a fixed period of time to be specified in the license but in no case to exceed 40 years from date of issuance." Consequently, no renewed license period can be greater than 40 years under the current regulatory requirements. However, Section 104 of the Atomic Energy Act does not establish a term limit for RTR licenses. Therefore, the Commission may either grant an exemption to the

regulations contained in 10 CFR 50.51(a), or establish a rule that would extend the license term for RTRs.

License terms are generally based upon the life expectancy of the facility and its components. In order to permit an extended term (including possibly an indefinite term), the staff would have to explain why it is appropriate and, more importantly, demonstrate that there are no aging concerns.

Environmental conditions such as temperature, pressure and radiation levels in most RTRs are not significant. With surveillance, maintenance and repair, RTRs can have indefinite lives.

For a facility to be eligible for an extended license term, the staff would complete a detailed renewal with a licensing basis reviewed against NUREG-1537. To maintain the licensing basis over time, the staff would propose a license condition or regulation that requires licensees to revise their SARs on a periodic basis such as every 2 years. The inspection program would be enhanced to place additional focus on surveillance, maintenance and repair, and changes to the facility made under 10 CFR 50.59. The licensee would still be required to adhere to changes in the regulations.

In addition, the public would still have the opportunity to raise concerns about the licensee. A member of the public could file a request under 10 CFR 2.206 to institute a proceeding under 10 CFR 2.202 to modify, suspend, or revoke a license or for any other action as may be proper. The staff could also offer the opportunity to the public to request a hearing on continuation of the license on some periodic basis such as every 20 years.

An extended license term would assure safe operation of the facilities in the exact same way as a license with a shorter duration. The requirement to periodically update the SAR would allow for the more even expenditure of licensee resources than updating documentation every 20 years. In focusing on the licensing basis periodically, licensees will have a more up to date understanding of their facilities. Public confidence is maintained by the enhanced inspection program and retaining periodic formal opportunity for hearing.

#### *Advantages of an Extended License Term*

An extended license term would streamline the license renewal process by having fewer license renewals required.

#### *Disadvantages of an Extended License Term*

The license renewal process ensures public confidence by reaffirming facility maintenance, the licensing basis and accident analyses, emergency planning, and facility and material security and safeguards. The extended period of the license, with fewer opportunities for public involvement, would be detrimental to ensuring public confidence.

### Other Staff Initiatives

Along with changes to the requirements for the renewal, the NRC staff has considered process changes that could increase the effectiveness of reviews and possibly decrease the burden on the licensee.

#### Regulatory Trees

The NRC staff has considered development of regulatory “trees” to help guide the NRC staff and contractors reviewing renewal applications. The regulatory “trees” would focus the staff on items required to make a regulatory finding of acceptability. Each of the regulatory requirements that must be satisfied for the license to be renewed would be presented in a schematic with various ways to meet the requirements. The staff would then canvas the application to ensure that the licensee properly addressed each of the regulatory requirements. The regulatory “trees” would focus the review, and potentially eliminate RAIs that are not necessary to make a regulatory finding of acceptability on the renewal application. For an example of the Regulatory Trees please see Enclosure 3.