

## **Progress on Licensing Applications – December 2018**

### **1. Progress to Eliminate the Backlog of Pending Licensing Actions**

The U.S. Nuclear Regulatory Commission (NRC) has taken specific actions to ensure greater discipline and management oversight in the request for additional information (RAI) process.

#### **Operating Reactors**

The Office of the Nuclear Reactor Regulation (NRR) continues to sustain the improvements in the RAI guidance and the accountability in the process. In April 2018, mandatory RAI refresher training was conducted for staff and branch chiefs. The training emphasized: (a) identifying the applicable technical and regulatory bases for RAIs; (b) ensuring that the RAIs issued are relevant to the licensing action being reviewed; (c) the requirements and expectations regarding the RAI administrative processes and records management; and (d) the expectation to strive for the RAIs issuance target of 5 days. Additionally, an NRR desk-top audit review guide and associated RAI quality review template are being piloted and will be finalized following a review of lessons learned from the pilot. These tools will be used to conduct RAI quality reviews that are scheduled to be conducted on a routine basis throughout the year. Lessons learned from the NRR RAI process will continue to be incorporated or expanded to update applicable standalone office-level guidance for other NRC programs such as license renewal and non-power production utilization facilities activities.

#### **New Reactors**

The Office of New Reactors (NRO) has taken several steps to ensure that its RAIs are consistently of high quality and are necessary to make a safety finding. In 2016, senior managers in NRO undertook initiatives to examine licensing activities with a goal of promoting a continued strong safety focus, consistency, efficiency, and clarity in our reviews of new reactor licensing applications. These initiatives included revising the RAI process to promote the consistent generation of high quality RAIs.

In October 2016, the NRO RAI process was revised (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16280A389) to include a new quality check audit process where, in addition to the technical branch's supervisor, the division management of both the technical and project management organizations review an RAI before it is issued to the applicant or licensee. In addition, the NRO Office Director reviews a sample of RAIs to keep abreast of high-priority issues identified in reviews and to support NRO's emphasis on effectiveness and efficiency as it focuses on safety, security, and environmentally significant matters.

On October 7, 2016, the NRO Office Director issued a memorandum titled "Effective Use of Request for Additional Information, Audit, and Confirmatory Analysis in New Reactor Licensing Review," to all NRO staff, which emphasized the goals of the RAI process, described the revised process, and included a job aid that contains best practices for preparing RAIs. The staff has incorporated many lessons-learned into its review of the active design certifications and early site permit applications. The 2016 initiative to improve the focus of RAIs has improved the quality and safety focus of these requests. The staff is also using the regulatory audit tool earlier in the process to better inform the staff about the bases supporting the

applications and therefore, better focus the staff's RAIs on information that directly relates to the staff reaching safety findings.

In early 2018, the staff conducted an audit to assess the effectiveness of the revised NRO RAI process. The audit evaluated whether the revised RAI process has yielded tangible improvements to NRO's licensing process. The RAI audit team found the quality of the RAIs from the current review process was generally high. The Director of NRO will review RAIs on a sampling basis to keep abreast of high-priority issues identified in reviews, and to support the focus on safety, security, and environmentally significant matters.

In August 2018, NRO completed a significant update to its guidance on the development, processing and issuance of RAIs. The updated guidance identifies the key attributes of high quality RAIs and provides direction for the staff in formulating RAIs to emphasize these attributes. One key attribute is ensuring that each RAI includes the safety, security, risk, and/or environmental significance of the question. This facilitates NRC's focus on the most risk and safety significant aspects of our reviews.

### **Nuclear Material Safety and Safeguards**

The Office of Nuclear Material Safety and Safeguards (NMSS) has established internal guidance for uranium recovery and waste program reviews that includes the expectation that RAIs will be developed in conjunction with the draft safety evaluation report (SER) to ensure that each RAI is necessary to reach a safety finding. In addition, the guidance contains the expectation to include a reference to the specific relevant requirement and encourages staff to conduct telephone conferences with licensees and applicants to efficiently resolve technical issues on RAIs. The NRC staff finalized an internal self-assessment that identifies possible efficiency improvements within the Uranium Recovery Program. The self-assessment includes recommendations for improving the efficiency of the RAI process, such as issuing RAIs as they are written rather than as a group, and reemphasizing the expectation that staff develop the draft SER and RAIs in concert.

NMSS continues to study RAI approaches used by other offices at the NRC, developing office procedures, revising guidance, and evaluating the development of job aids to incorporate applicable RAI approaches from other NRC branches, divisions, and offices. Following completion of this effort, NMSS will develop an appropriate training plan to implement the resulting RAI process products.

In addition, NMSS is revising NUREG-1556, Volume 20, "Guidance about Administrative Licensing Procedures," to improve consistency and management oversight between NRC headquarters and regional materials licensing staff.

In August 2016, NMSS's Division of Spent Fuel Management (DSFM) issued DSFM-26, Rev., 0, which provided management expectations and guidance to employees with regard to meeting division and business line goals, including the goal of one round of RAIs for a typical review and a maximum of two rounds of RAIs in any review. RAIs and the applicant's responses need to converge on the information needed for making a regulatory finding. As part of the management oversight process, the staff has been seeking management concurrence when a second round of RAIs is being considered during the review. In addition, the staff has developed further guidance on preparing RAIs that are clear, complete, and specific with respect to the requested information, the justification for the request, and the associated regulatory basis. This guidance is part of continuous training, supplemented by a desk guide

and a quick reference card for all reviewers. The division recently completed a self-assessment on spent fuel storage and transportation licensing RAIs that were issued in Fiscal Year (FY) 2017. The self-assessment evaluated the clarity and effectiveness of RAIs issued by DSFM, and identified potential improvements to the RAI development process. Follow up activities will be based on the self-assessment's results.

The division that focuses on fuel cycle facilities and environmental reviews conducted a review of its RAI process during the second quarter of FY 2017. Staff reviewed audit reports from the NRC's Office of the Inspector General and the U.S. Government Accountability Office (GAO) "Statement of Facts" (GAO Job Code 100910). The NRC staff assessment report is at ADAMS Accession No. ML17102A783. The NRC staff also reviewed the internal policies and interviewed subject matter experts throughout the agency. The results of this assessment, including staff's recommendations and proposed actions for implementing recommended improvements, were documented in a report to management on May 25, 2017. The report proposed revisions to the FCSE Licensing Review Handbook, including:

- Periodically reinforcing expectations of key aspects in the RAI process during licensing seminars or division meetings;
- Promoting a more consistent and uniform use and application of the guidance, particularly following the instructions on interactions with the licensee, drafting the SER as a tool to identify any RAIs, having a sound regulatory basis for the RAIs, and maintaining licensing reviews aligned with its scope;
- The addition of clear instructions specifying that RAIs should not request information available elsewhere; and
- Continuing with current management oversight practice for RAIs process, such as elevating any challenges encountered during the RAI process to division management for their awareness and involvement.

Based on recommendations, this division has conducted two licensing seminars on RAIs for Project Managers and Technical Reviewers, as well as a team meeting for those involved in the license renewal application review for Honeywell International. The guidance in the Licensing Review Handbook was updated to address the report's recommendations. The final document was issued on October 31, 2018.

No adverse findings were identified in the Final GAO Report GAO-17-344, "*U.S. Nuclear Regulatory Commission: Efforts Intended to Improve Procedures for Requesting Additional Information for Licensing Action are Under Way*," dated May 25, 2017.

## **Summary**

Efforts to establish consistent procedures throughout the agency are being initiated through a working group to align, where appropriate, licensing strategies across the agency including the RAI process. This working group includes representatives from NMSS, NRR, NRO, Office of Nuclear Security and Incident Response, and Office of the General Counsel.

## 2. Status of License Renewal Reviews

### Operating Reactors

Applicant	Application Accepted for Review	Review Status for Long-Term Application Reviews
Seabrook 1	07/21/2010	<p>In August 2016, NextEra submitted a license amendment request (LAR) to the current license to adopt a methodology for the analysis of seismic Category I structures with concrete affected by Alkaline Silica Reaction (ASR). This methodology is the basis for the aging management program being evaluated under the license renewal application review. The Atomic Safety and Licensing Board (ASLB) granted a hearing on the ASR LAR, which is expected to be held in mid-2019. The staff issued its SER for the license renewal application and its draft safety evaluation on the LAR on September 28, 2018. The staff met with the ACRS subcommittee on October 31, 2018, with respect to the ASR LAR and the license renewal application. The ACRS subcommittee meeting on the remaining issues related to the license renewal application was November 15, 2018, and the full committee meeting was December 6, 2018. The ACRS provided its recommendation letters to the Commission on December 14 and 19, 2018, regarding closure of the open item on ASR for the license renewal safety evaluation and for issuance of the Seabrook renewed license. The NRC staff's review of the ASR license amendment and license renewal application, including the aging management programs for the ASR issue, is complete. The NRC staff plans to meet with the public in the Seabrook area on February 13, 2019, to discuss its plans to issue the license amendment and renewed license prior to completion of the ASLB hearing on the license amendment. The staff's decision to issue the license amendment before the completion of the ASLB hearing on the license amendment is in accordance with Atomic Energy Act Section 189a.(2)(A) and the NRC's regulations at 10 CFR 2.1202, 10 CFR 2.340, and 10 CFR 50.92(c). Specifically, this statute and these regulations allow the issuance of an amendment during the pendency of a hearing upon a determination by the NRC that the amendment involves no significant hazards consideration. The NRC has determined that the license amendment involves no significant hazards consideration.</p>
Waterford	05/31/2016	<p>On December 27, 2018, the NRC renewed this operating license for an additional 20 years.</p>
River Bend	08/07/2017	<p>On December 20, 2018, the NRC renewed this operating license for an additional 20 years.</p>

**Research and Test Reactors License Renewal Applications Currently Under Review**

<b>Facility Name</b>	<b>Application Date</b>	<b>Status</b>
Texas A&M University (TAMU) Aerojet-General Nucleonics (AGN) Reactor	07/22/1997 (on hold)	The review of the TAMU AGN reactor license renewal application (LRA) is on hold. The AGN license currently allows only possession of the reactor. The licensee partially disassembled and placed the reactor into storage at the Texas Engineering Experiment Station TRIGA [Training, Research, Isotopes, General Atomics] reactor facility, where the licensee has started construction on support laboratory space for the AGN reactor. The NRC staff will resume its review of the LRA once the licensee submits a revised safety analysis report as part of an application for a construction permit to reassemble the AGN in its new location.
Aerotest Radiography and Research Reactor	02/28/2005 (LRA resubmitted on 12/20/2017) (LRA suspended 12/06/2018)	The NRC staff has suspended its review of the Aerotest LRA. By letter dated December 6, 2018, the licensee requested to withdraw its LRA from NRC consideration. The licensee stated that it plans to submit an application to the NRC to amend its license to possession-only as a preliminary step toward decommissioning the facility.
University of Texas at Austin (UTA)	12/12/2011 (on hold until 08/30/2019)	By letter dated December 14, 2018, UTA staff have proposed a milestone schedule that would provide the results of the neutronic and thermal-hydraulic analyses to the NRC by August 30, 2019. UTA has obtained a contract from the U.S. Department of Energy and will collaborate with staff from Oregon State University to help ensure the accuracy and completeness of the neutronic and thermal-hydraulic analyses. Following receipt of the UTA analyses, the NRC staff will validate the results and resume the license renewal review.
University of Massachusetts at Lowell	10/20/2015	The review is in progress and on schedule for completion in 2019. The NRC staff is drafting the SER. By letter dated November 5, 2018, the NRC staff sent the licensee a RAI primarily related to the technical specifications. The NRC staff is also preparing a RAI to address the digital instrumentation and control upgrades proposed by the licensee in conjunction with license renewal.

Facility Name	Application Date	Status
North Carolina State University	02/24/2017	The review is in progress and on schedule for completion in 2019. The NRC staff is drafting the SER. By letter dated October 18, 2018, the NRC staff sent the licensee RAIs related to safety, financial, environmental, operator requalification, and supporting information. By letter dated November 1, 2018, the licensee provided partial responses. By letter dated December 13, 2018, the licensee requested an additional sixty days to complete the remaining responses. The licensee stated that the additional time is needed to perform additional computational analysis.
University of California at Davis	06/11/2018	The review is in progress and on schedule for completion in 2020. The NRC staff is reviewing the license renewal application and drafting the SER. The NRC staff conducted a site visit on September 5, 2018, and an additional visit is being proposed for April 2019, pending completion of the draft SER and any RAIs.

### 3. Status of Power Uprate Application Reviews

The NRC staff currently has no power uprate applications under review.

### 4. Status of Design Certification Applications

The NRC employs a six-phase schedule to monitor progress towards completion of the safety review. These phases are:

- Phase 1 - Preliminary SER with RAIs issued to applicant
- Phase 2 - SER with Open Items issued
- Phase 3 - Response to the ACRS regarding SER with Open Items issued
- Phase 4 - Advanced SER with no Open Items issued
- Phase 5 - Response to ACRS regarding SER with no Open Items issued
- Phase 6 - Final Safety Evaluation Report (FSER) issued

### US-Advanced Pressurized-Water Reactor

Mitsubishi Heavy Industries (MHI) submitted its US-Advanced Pressurized-Water Reactor (US-APWR) DC application on December 31, 2007. The staff is currently in Phase 2 of the review. By letter dated November 5, 2013, MHI initiated a coordinated slowdown of NRC licensing activities in order to focus its resources towards supporting the restart of

the Mitsubishi-designed reactors in Japan following the Fukushima event. The NRC staff has been performing the review of this application at a reduced pace and will continue to do so until further notice from the applicant. As of December 31, 2018, the staff has issued 5,683 RAIs and the applicant has responded to 5,534 of them.

### NuScale

On January 6, 2017, NuScale submitted the first small modular reactor design certification application for review by the NRC. On March 15, 2017, the NRC completed its acceptance review and docketed the application. The staff issued the acceptance review letter to NuScale on March 23, 2017, and developed a full review schedule with public milestones that was transmitted to NuScale on May 22, 2017. On April 11, 2018, the staff completed Phase 1 of the review. The staff's review is currently in Phase 2 and Phase 3. To date the NRC has identified 29 significantly challenging issues requiring resolution and that have the potential to adversely affect the review schedule. Of these 29 issues, 13 are now considered resolved. As of December 31, 2018, the staff has issued 512 RAIs, which included 1,311 questions. The applicant has responded to 1,161 of these questions. Of the 512 RAIs issued, 253 RAIs (~49 percent) are now closed. As of December 31, 2018, NuScale has responded to approximately 63 percent of RAI questions within the 60 days agreed to in the staff's May 22, 2017, schedule for the design certification review.

## 5. Status of Design Certification Renewal Applications

### Advanced Boiling-Water Reactor Renewal (General Electric-Hitachi)

On December 7, 2010, General Electric-Hitachi (GEH) submitted an application for renewal of the Advanced Boiling-Water Reactor (ABWR) DC. The NRC staff is currently preparing the safety evaluation. The NRC staff issued a letter to GEH on July 20, 2012, describing 28 design changes that GEH should have included in the application. By letter dated September 17, 2012, GEH stated it planned to address the 28 items in its Revision 6 of the ABWR design control document (DCD). By letter dated February 19, 2016, GEH submitted its revised application incorporating the changes to the ABWR DCD. On August 30, 2016, the staff issued a schedule letter to GEH based on resolving all open items by January 2017. However, some open items associated with the review of the application remain unresolved. On August 3, 2017, the staff issued a letter to GEH stating that the NRC will not be able to meet the original schedule outlined in the August 30, 2016, letter due to unresolved issues with the application. The letter also stated that the NRC will issue a revised schedule letter to GEH after additional interactions with the applicant are held to resolve these issues and the staff receives complete responses to the NRC's RAIs. As of December 31, 2018, the staff has issued 37 RAIs and the applicant has responded to all of them.

## 6. Status of Combined License Applications

The NRC staff currently has no combined license applications under review.

## 7. Status of Early Site Permit Applications

### Clinch River

On May 12, 2016, the Tennessee Valley Authority (TVA) submitted an early site permit (ESP) application for the Clinch River Nuclear Site located in Oak Ridge, TN. By letter

dated August 11, 2016, TVA identified certain aspects of the application that it intended to supplement. The NRC responded to TVA in a letter dated August 19, 2016, and informed TVA that its application would remain in a tendered but not docketed status until all of the supplemental information was provided to NRC. By December 15, 2016, TVA provided the supplemental information in support of its application, and by letter dated January 5, 2017, the NRC staff informed TVA that its application, as supplemented, was acceptable for docketing and detailed technical review.

NRC staff began its detailed technical review of the ESP application in January 2017, and developed a full review schedule with public milestones that was transmitted to TVA on March 17, 2017. The Phase A safety review for all chapters of the application was completed by the staff on August 4, 2017, consistent with the established schedule. The staff completed Phase B of its review on October 17, 2018. Phase C review activities took place in parallel with Phase B for some safety evaluations sections. On December 6, 2018, the NRC staff completed safety public milestone, Phase C – “ACRS Review and Meetings on Advanced Safety Evaluations”. Phase C was scheduled to be completed by March 26, 2019, thus the staff’s review is currently significantly ahead of schedule. As of December 31, 2018, the staff has issued 50 safety-related RAI questions and the applicant has responded to all 50 RAI questions. One hundred percent of the RAI questions issued and responded to are closed. The final SER is currently scheduled to be issued in August 2019. For the environmental review, the NRC staff issued the draft environmental impact statement (EIS) on April 27, 2018. The public comment period for the draft EIS closed on July 13, 2018. Based on one of the comments received from the applicant, the staff issued one environmental RAI question in September 2018, and the applicant responded to that RAI in October 2018. The final EIS is scheduled to be complete by June 2019.

On June 12, 2017, the Southern Alliance for Clean Energy (SACE), Tennessee Environmental Coalition (TEC), and Blue Ridge Environmental Defense League filed petitions seeking a hearing. The ASLB denied the Blue Ridge Environmental Defense League’s petition to intervene and granted the SACE and the TEC’s joint petition to intervene and admitted two contentions. Separately, TVA appealed the admission of the two contentions to the Commission, and the Commission upheld the admission of one contention and dismissed the other. In April 2018, the staff published its draft EIS two months ahead of the public milestone. On May 21, 2018, SACE/TEC submitted two new contentions on the draft EIS. On July 31, 2018, the ASLB issued a memorandum and order (LBP-18-04) denying the Intervenor’s motion for leave to file new contentions, granted TVA’s and the NRC Staff’s Motions to dismiss the remaining admitted contention, and terminated the contested proceeding. The Board’s decision was not appealed.

The Commission will conduct the mandatory hearing on the application. The schedule for the mandatory hearing will be established after the final EIS and FSER are completed.



8. Status of Uranium Recovery Licensing Application Review

Uranium Recovery Applicant	Application Accepted for Review	Review Status
Cameco North Trend Expansion (NE)	08/28/2007	The SER for the North Trend expansion was completed in July 2013. On December 16, 2015, the licensee requested the NRC staff to stop its review of the North Trend application and to instead focus its efforts on the review of the Marsland expansion. The NRC staff has suspended its work related to the development of the draft Environmental Assessment and conduct of Section 106 consultations pursuant to the National Historic Preservation Act. In addition, the hearing to address contentions related to groundwater is on hold, pending completion of the NRC staff's environmental review. By letter dated April 4, 2018, Cameco reiterated its request that the staff continue to hold its review in abeyance.
Hydro Resources, Inc. (HRI) License Renewal (NM)	06/24/2013	The sites, located very close to Navajo Nation lands, were licensed in 1998. Construction has not yet commenced. The license renewal review was placed in abeyance on November 13, 2014, while HRI continues its work with the Navajo Nation Council. In March 2016, the NRC approved the transfer of control of the license from the HRI parent company, Uranium Resources, Inc., to Laramide Resources. The parties finalized the transaction in January 2017. The schedule for remaining milestones associated with the licensing review is to be determined.
Cameco Three Crow Expansion (NE)		Three Crow is an expansion of the operating Crow Butte facility located in Crawford, NE. The NRC staff started its acceptance review on March 3, 2011, and was waiting for the licensee to complete changes in its design prior to acceptance. However, in November 2014, the licensee requested that the NRC staff place the review on hold. The acceptance review process remains on hold at the request of the licensee.