Progress on Licensing Applications – September 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 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

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 that the quality of the RAIs that have gone through the revised review process was generally high.

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 environmental significance of the question and of the staff 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 notes that the RAI should contain 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 safety evaluation and RAIs in concert.

NMSS also continues to study RAI approaches used by other offices at the NRC. 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." Information in this guidance regarding RAIs for materials licensing actions is being updated to improve consistency and management oversight between NRC headquarters and regional materials licensing staff.

In August 2016, NMSS also issued expectations and guidance to employees in its spent fuel management division that specifically stated a 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 a 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. This division is also conducting a self-assessment on spent fuel storage and transportation licensing RAIs during FY 2018.

The division that focuses on fuel cycle facilities and environment 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 FCSE 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 safety evaluation report 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 schedule for completing tasks to update the guidance was revised, targeting the end of October 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 will include representatives from NMSS, NRR, NRO, NSIR, 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
Indian Point 2 & 3	08/01/2007	The renewed operating licenses for both units were issued on September 17, 2018.

Applicant	Application Accepted for Review	Review Status for Long-Term Application Reviews
Seabrook 1	07/21/2010	The NRC staff continues discussions with NextEra to ensure that technical issues related to the alkali-silica reaction (ASR) open item in the SER are properly addressed. 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 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) has granted a hearing on the ASR LAR. After the NRC staff completes its safety evaluation of the ASR LAR, the ASLB hearing will be held and the Advisory Committee on Reactor Safeguards (ACRS) will also perform its review. The review of this amendment has a direct impact on the schedule for the license renewal review. The staff issued its safety evaluation report for the license renewal application and its draft safety evaluation on the LAR on September 28, 2018. The staff plans to meet 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 is scheduled for November 15, 2018, and the full committee meeting is scheduled for December 6, 2018. The ASLB's hearing on the ASR LAR is currently scheduled for summer 2019. Final licensing decisions on both applications will be made after the hearing.
Waterford	05/31/2016	The NRC staff continues their safety and environmental reviews, including the resolution of specific questions regarding the Waterford neutron fluence time-limited aging analysis. The staff issued the draft safety environmental impact statement (DSEIS) on August 15, 2018, and it was published as NUREG-1437, Supplement 59, on August 29, 2018. The SER was issued on August 17, 2018, and the staff met with the ACRS Subcommittee on license renewal on September 20, 2018, and presented the results of its safety review. The ACRS subcommittee provided its recommendations to the full committee on November 1, 2018. The decision regarding the renewal of the operating license is expected to be issued in the 1st quarter of FY 2019.

Applicant	Application Accepted for Review	Review Status for Long-Term Application Reviews
River Bend	08/07/2017	The NRC staff continues the safety and environmental reviews. The SER was issued on August 16, 2018, and the staff met with the ACRS subcommittee on license renewal on September 20, 2018, and presented the results of its safety review. The ACRS subcommittee provided its recommendations to the full committee on November 1, 2018. The DSEIS was issued for public comment on May 25, 2018, and was subsequently published as a supplement to the "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (NUREG-1437, Supplement 58), on May 30, 2018. The comment period on the DSEIS closed in July 2018, and the staff is working to respond to these comments as it develops the final supplemental environmental impact statement, which is expected to be issued in November 2018.

Research and Test Reactors License Renewal Applications Currently Under Review

Facility Name	Application Date	Status
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 licensee disassembled and relocated the reactor into storage at the Texas Engineering Experiment Station, where the licensee intends to build a new facility to house the AGN. The NRC staff will resume its review of the LRA once the licensee submits a revised safety analysis report describing the new location of the reactor.
Aerotest Radiography and Research Reactor	02/28/2005 (LRA resubmitted on 12/20/2017)	The licensee updated and resubmitted the LRA on December 20, 2017, following the resolution of foreign ownership, control, or domination issues by the indirect license transfer to Nuclear Labyrinth, LLC. The NRC staff has resumed its review of the LRA and determined that the licensee has not provided the facility-specific neutronic, thermal-hydraulic and accident analyses needed to support its renewal application. In April 2018, the NRC staff requested that the licensee supplement its application with this information, and the licensee has requested an extension until December 2018, to respond. After this information has been provided, a review schedule will be established.

Facility Name	Application Date	Status
University of Texas at Austin (UTA)	12/12/2011	The NRC staff completed its review of the licensee's neutronic and thermal-hydraulic analyses submitted in response to NRC staff RAIs by letter dated March 8, 2018. The NRC staff determined that significant information was missing such that the NRC staff could not complete its review. The NRC staff subsequently met with UTA during a site visit on August 14 and 15, 2018. UTA staff agreed with the NRC staff's assessment of the neutronic and thermal-hydraulic analyses, and furthermore, will seek technical support from the Department of Energy (DOE). Since the meeting, DOE has contracted with Oregon State University to provide support to UTA and some information exchange has occurred. The NRC staff held a conference call on October 18, 2018, to discuss the status and schedule with UTA. A revised review schedule is now being established.
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, and has completed and provided the licensee with a draft RAI related to the technical specifications. The NRC staff is also preparing a RAI to address the digital instrumentation and control upgrades that the licensee has proposed in conjunction with the 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. A site familiarization visit was conducted on May 3, 2018, and the status of the review was discussed. The NRC staff is drafting the SER. The NRC staff prepared safety, financial, environmental, and operator requalification RAIs that were issued in October 2018. The licensee provided its responses to the security RAIs on July 17, 2018. On August 30, 2018, the NRC staff held a conference call with the licensee to discuss concerns with its responses to the security RAIs. The NRC staff is awaiting a supplemental response from the licensee.
University of California at Davis	06/11/2018	The review is in progress and on schedule for completion in 2020. The NRC staff is drafting the SER. The project manager conducted a site visit on September 5, 2018, and a site familiarization visit for NRC's contractor 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 September 30, 2018, the staff has issued 5,683 RAIs and the applicant has responded to 5,534 of them.

Advanced Power Reactor 1400

On December 23, 2014, Korea Electric Power Corp. and Korea Hydro & Nuclear Power Co., Ltd. (KHNP), submitted to the NRC its application for the certification of the Advanced Power Reactor 1400 standard plant design for use in the U.S. domestic energy market. The NRC completed the Phase 5 review on July 30, 2018, meeting the public milestone. The NRC completed its review and Phase 6 on September 28, 2018, meeting the public milestone. As of September 30, 2018, the staff had issued 2,225 RAIs and the applicant has responded to all of them. The staff received the final safety analysis report, verified that the applicant incorporated all changes in accordance with previously submitted RAI responses, and closed all RAIs. The FSER and Standard Design Approval were issued to KHNP on September 28, 2018. The rulemaking to certify this standard design is ongoing but because the technical safety review has been completed, this project will be removed from future reports.

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, 8 are now considered resolved. As of September 30, 2018, the staff has issued 502 RAIs, which included 1,294 questions. The applicant has responded to 1,111 of these questions. Of the 504 RAIs issued, 176 RAIs (~35 percent) are now closed. As of September 30, 2018, NuScale has responded to approximately 73.5 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 September 30, 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 is currently in Phase B of its review, which is scheduled to conclude in October 2018. Phase C review activities are also now underway (parallel with Phase B) for some safety evaluations sections, and Phase C is expected to be completed in March 2019. As of September 30, 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 (BREDL) filed petitions seeking a hearing. On October 10, 2017, the ASLB issued a decision that denied the BREDL'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. 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 Intervenors' 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[1] (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 (EA) 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.
Uranium One Ludeman Expansion (WY)	05/16/2012	The NRC staff completed the final EA on August 2, 2018. The NRC staff completed its safety review documented in the final SER on March 1, 2018. The NRC staff issued the license amendment for the Ludeman expansion on August 24, 2018. On September 30, 2018, the NRC relinquished its oversight responsibilities for this project to the State of Wyoming.
Cameco Smith Ranch License Renewal[1] (WY)	07/05/2012	Environmental and safety reviews are in progress. The NRC staff and Cameco met on February 21, 2018, to discuss Cameco's RAI responses. Cameco submitted updated RAI responses related to hydrogeology on March 7, 2018. The NRC staff received Cameco's remaining updated RAI responses on July 30, 2018. The NRC staff issued a renewed license for the Smith Ranch facility on September 26, 2018. On September 30, 2018, the NRC relinquished its oversight responsibilities for this project to the State of Wyoming,
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.

Uranium Recovery Applicant	Application Accepted for Review	Review Status
Strata Kendrick Expansion (WY)	01/14/2016	On May 27, 2016, and September 14, 2016, the NRC staff issued RAIs for the environmental review and for the safety review, respectively. On December 15, 2016, the licensee requested that the NRC cease all activities related to this review. On September 30, 2018, the NRC relinquished its oversight responsibilities for this project to the State of Wyoming.
Lost Creek KM Horizon/East Expansion (WY)	05/02/2017	By letter dated February 27, 2017, the licensee resubmitted a revised application. The NRC staff accepted the application for review on May 2, 2017. The NRC staff continues to coordinate with the Bureau of Land Management (BLM) in its preparation of the EIS in accordance with the BLM/NRC memorandum of understanding and the letter of December 4, 2014, designating BLM as the lead agency and NRC as a cooperating agency. BLM is scheduled to publish the final EIS in December 2018. The NRC staff is submitting its RAIs in batches in order to support BLM's schedule for issuing the EIS. The NRC staff issued its initial set of RAIs on July 27, 2017, its second set of RAIs on August 28, 2017, and its third set of RAIs on October 30, 2017. The FSER was issued on August 7, 2018. On September 30, 2018, the NRC relinquished its oversight responsibilities for this project to the State of Wyoming.
Cameco Three Crow Expansion[(1)] (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 and instead focus efforts on the review of the Marsland expansion (the Marsland application is currently in litigation before the ASLB). The acceptance review process remains on hold.

[(1)] On February 9, 2018, Cameco announced that it is ceasing U.S. operations due to an expectation of prolonged poor uranium market conditions. The NRC staff is proceeding with its licensing reviews while seeking further information from Cameco regarding its licensing plans.