

## Progress on Licensing Applications – December 2017

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

#### Operating Reactors

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.

On June 30, 2014, the Commission issued a Staff Requirements Memorandum (SRM) (Agencywide Documents Access and Management Systems (ADAMS) Accession No. ML14181B402) directing the staff to consider, in the context of Project Aim, ways to reduce the licensing action backlog and get back on target with respect to timeliness. In response to the SRM, the Office of Nuclear Reactor Regulation (NRR), as operating reactor business line lead, has launched several initiatives and taken other actions to focus on how the NRC can leverage or revise its existing licensing processes to enhance agency efficiency, effectiveness, and predictability as a regulator, while maintaining a continued strong safety focus. These initiatives have analyzed the issues that caused the backlog, including issues related to the RAI process, and provided recommendations to NRR management regarding enhancements to the licensing review process. In part, as a result of recommendations from the initiatives, NRR management issued interim guidance to the staff in January 2015, and updated interim guidance in April 2016, that provides expectations to help ensure consistency of the licensing review process, sound decision-making, and schedule discipline. In January 2017, this interim guidance was incorporated into NRR procedures. Some of the key items in the procedures that have added discipline and management oversight to the RAI process include the following:

- NRR staff review of an application will be limited to the scope of the licensing action and RAIs should have a clear nexus to information required to make a safety determination regarding the licensing action.
- At the point when RAIs are transmitted from the technical staff to the NRR project manager, the technical staff is expected to have developed a draft safety evaluation (SE). In addition to ensuring that the RAIs contain both a sound technical and regulatory basis, the technical staff should be able to correlate each RAI to a “hole” in the draft SE that the licensee response is intended to fill.
- NRR management will maintain a focus on RAIs. Prior to sending a second (and any subsequent) round of RAIs in a specific technical area, NRR division level management will apply additional oversight to discuss the need for the RAIs and whether alternative methods, such as a public meeting or audit, may be more effective and efficient for determining the necessary information that the licensee needs to submit.
- NRR project managers are expected to track licensee timeliness and adherence to RAI response schedules. Any significant delays in licensee responses will be brought to NRR management attention.

Training sessions on RAI quality and process were held with the technical and project management staff. In addition, following issuance of the finalized NRR guidance in this area in January 2017, an online training package was developed and provided to the NRR staff.

This training covers expectations regarding added discipline and management oversight of the RAI process. Other actions taken that help provide a stable and sustainable improvement in the RAI process and add accountability to the process include:

- In November 2014, NRR management began holding periodic meetings to discuss open licensing actions, develop alignment on the best approaches to completing these actions, and monitor licensing performance.
- In October 2016, NRR replaced the existing software used to manage and monitor licensing reviews with a newly developed software package called the Reactor Protection System-Licensing/Workload Management software. This system has the capability to better track RAI issuance and status.
- NRR performed an internal audit of a sample of RAIs issued between April and December 2016 and found that the overall adherence to quality, timeliness, and process expectations was satisfactory. The audit team identified areas for continued improvement and recommended increased staff training on the RAI guidance, development of staff job aids, and consideration of modifications to staff guidance to better reflect the reactor license renewal and non-power utilization facilities licensing processes.

NRC also considers its approach to RAIs in other areas of licensing work:

### **Decommissioning and Low-Level Waste**

The Office of Nuclear Material Safety and Safeguard's (NMSS) Division of Decommissioning, Uranium Recovery, and Waste Programs' (DUWP) internal guidance includes the expectation that RAIs will be developed in conjunction with the draft Staff Evaluation Report (SER) to ensure that the RAI is necessary to reach a safety finding. In addition, the guidance contains the expectation to include in the RAI a reference to the specific requirement that has not been met, and encourages staff to conduct telephone conferences with licensees and applicants to efficiently resolve technical issues on RAIs. The NRC staff recently 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. DUWP also is currently looking at RAI approaches taken by other divisions within NMSS and other offices at NRC.

### **New Reactors**

In October 2016, the Office of New Reactors (NRO) revised an RAI job aid document to serve as guidance for staff when preparing RAIs to include a new quality check audit process. This would involve the technical branch supervisor, as well as the division management of both the technical and project management organizations, reviewing an RAI before it is issued to the applicant or licensee.

In fiscal year (FY) 2018, the staff plans to conduct an audit to determine whether the revised RAI process has yielded desirable quality, process, and timeliness outcomes. The audit is expected to evaluate whether the revised RAI process has yielded tangible improvements to

NRO's licensing process, whether the benefits of the revised RAI process exceed the costs of its implementation, and if the revised RAI process should be maintained, modified or eliminated.

In order to enable consistent agency-wide procedures and licensing strategies, including the RAI process, the agency has established a working group, which includes representatives from NMSS, NRR, NRO, the Office of Nuclear Security and Incident Response (NSIR), and the Office of 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	<p>The NRC staff is working to address public comments received on its draft second supplement to the final supplemental environmental impact statement, which was issued for comment in December 2015. The staff's response to the public comments will be documented in the final supplemental environmental impact statement supplement, which is currently under final review. The initial SER was issued in November 2009, with supplements issued in August 2011 and July 2015. A third SER supplement will be issued in the second quarter of FY 2018 to address new information received by the staff concerning safety issues. In January 2017, the parties to the legal proceedings reached an agreement that resulted in the withdrawal of all contentions on the license renewal application. Under the agreement, Units 2 &amp; 3 will cease operations in April 2020 and 2021, respectively, with possible extensions to operate until April 2024 and 2025, respectively. On February 8, 2017, the State of New York Department of Environmental Conservation (NYDEC) and Riverkeeper filed an unopposed motion to the Atomic Safety and Licensing Board (ASLB) to withdraw their contentions and terminate the adjudicatory proceeding. The Licensing Board granted that motion and terminated the adjudicatory proceeding on March 13, 2017. Recently the National Marine Fisheries Service (NMFS) designated critical habitat in the Hudson River for Atlantic Sturgeon. Ongoing interactions between the NRC staff, NMFS, NYDEC, and Entergy regarding this new designation and Entergy's monitoring plan for sturgeon are expected to be completed in the second quarter of FY 2018. Resolution of this issue will be documented in the Record of Decision issued in conjunction with the renewed operating licenses for the units. A decision on the renewed operating licenses for both units is expected to be issued in the 4th quarter of FY 2018.</p>

Applicant	Application Accepted for Review	Review status for long-term application reviews
Diablo Canyon 1&2	01/21/2010	In April 2011 and July 2016, the NRC suspended the license renewal review. In June 2016, Pacific Gas and Electric requested the suspension to allow it to seek approval from the California Public Utilities Commission (CPUC) of an agreement in principle not to proceed with license renewal for Diablo Canyon. The CPUC approved the agreement in January 2018.
Seabrook 1	07/21/2010	The NRC staff continues to work 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. On October 6, 2017, the ASLB admitted a contention on the ASR LAR. The review of this amendment is currently scheduled to be completed by December 2018 and has a direct impact on the schedule for the license renewal review. Therefore, the current schedule for remaining license renewal milestones is to be determined.
Waterford	05/31/2016	The NRC staff continues work on the safety and environmental reviews and on specific questions regarding the Waterford neutron fluence time-limited aging analysis. The applicant submitted a LAR in November 2017 that will request approval of their plant-specific neutron fluence methodology, which is applied to the reactor vessel neutron fluence embrittlement analysis referred to in the license renewal application. The review of the LAR will take approximately 1 year. The license renewal application fluence methodology review is dependent on the approval of the LAR. Therefore, the decision on the renewed operating license is expected to be issued in the 3 <sup>rd</sup> quarter of FY 2019.
River Bend	08/07/2017	The staff continues to work on the safety and environmental reviews, which are expected to take approximately 18 months. A petition to intervene and request for hearing has been filed. A Licensing Board has been established to rule on the petition and to preside over any hearing that may be held. A telephonic oral argument concerning standing and contention admissibility was held on November 30, 2017. On January 8, 2018, the Licensing Board denied the petition to intervene.

**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	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 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	Aerotest updated and resubmitted the license renewal application following the resolution of foreign ownership, control, or domination issues by consummating the indirect license transfer of the company to Nuclear Labyrinth, LLC, in August 2017. NRC has resumed its review of Aerotest's license renewal application.
University of Texas at Austin	12/12/2011	The review is in progress. The licensee is completing neutronics and thermal-hydraulic analyses, which are needed for the NRC to complete its review.
University of Massachusetts at Lowell	10/20/2015	The review is in progress and on schedule.
North Carolina State University	02/24/2017	The review is in progress and on schedule.

### 3. Status of Power Uprate Application Reviews

The NRC staff currently has the following power uprate application under review:

#### Hope Creek Generating Station

The Hope Creek Generating Station, measurement uncertainty recapture uprate application was accepted for review on August 16, 2017. The staff is currently performing its safety evaluation.

### 4. Status of Design Certification Applications

#### US-APWR

Mitsubishi Heavy Industries (MHI) submitted its 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 Mitsubishi designed reactors in Japan following the Fukushima event. The NRC staff will continue the review of the US-APWR DC application at a very reduced pace until further notice from the applicant. As of November 30, 2017, the staff has issued 5680 RAI questions and the applicant has responded to 5532 RAI questions.

#### APR1400

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 APR1400 standard plant design for use in the U.S. domestic energy market. The NRC completed the Phase 2 review (issuing SER with open items) for all chapters of the application in May 2017 and completed the Phase 3 review (ACRS review of the SER with open items) in June 2017. The staff is currently in Phases 4 (issuing the advanced SER with no open items) and 5 (responding to ACRS regarding SER with no open items issued) of its review. As of November 21, 2017, the staff had issued 2,199 RAI questions and the applicant has responded to 2,195 RAI questions. Of the RAI questions issued, 99% are closed or are considered confirmatory actions that the staff will verify, upon receipt of the updated final safety analysis report, that the applicant has incorporated all changes in accordance with the response approved by the staff. On October 31, 2017, the staff issued an updated schedule letter to KHNP explaining that, although the NRC staff has made substantial progress toward completing both the remaining Phase 4 and Phase 5 reviews, issues related to the technical quality, completeness, or timeliness of the applicant's submittals have resulted in delays that affected the milestone dates for completion of Phase 4 and Phase 5 in several areas. The combined effect of the issues discussed in the letter resulted in a delay to the completion of the Phase 4 advanced SERs. Therefore, the staff revised the Phase 4 public milestone date from December 2017 to March 2018, recognizing the potential for additional delays to this phase if KHNP does not address these issues in a timely manner. While no change was made to the Phase 5 or Phase 6 (issuing the final SER) milestone dates, the Phase 4 delay may also impact the completion of the review schedule within 42 months.

#### NuScale

On January 6, 2017, NuScale submitted the first small modular reactor (SMR) DC application for review by the NRC. On March 15, 2017, the NRC completed its acceptance review and concluded that the application was acceptable for 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. The staff's review is currently in Phase 1 (preparing the preliminary SER and issuing RAIs) and Phase 2 (issuing SER with open items). The NRC has identified 23 critical issues requiring

resolution and that have the potential to extend the review schedule. As of November 30, 2017, the staff has issued 851 RAI questions and the applicant has responded to 547 RAI questions. Of the RAI questions issued, 46% are closed.

#### 5. Status of Design Certification Renewal Applications

##### ABWR Renewal (General Electric-Hitachi (GEH))

On December 7, 2010, GEH submitted an application for renewal of the ABWR DC. The review is currently in Phase 2 (issuing SER with open items). The NRC staff issued a letter to GEH on July 20, 2012, describing certain design changes (28 items) 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 DCD. By letter dated February 19, 2016, GEH submitted its revised application (Revision 6) incorporating changes to the ABWR Design Control Document (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 would 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 RAI questions. As of November 30, 2017, the staff has issued 37 RAI questions and the applicant has responded to all RAI questions.

#### 6. Status of Combined Operating License Applications

##### Turkey Point Units 6 and 7

On June 30, 2009, Florida Power & Light Company (FPL) submitted a COL application for two AP1000 units at the existing Turkey Point Nuclear Generating Station site in Miami-Dade County, FL. On September 4, 2009, the NRC staff issued a letter to FPL indicating the Turkey Point COL application was acceptable for docketing.

The NRC staff completed its safety review and presented the final SER to ACRS on August 19, 2016. The final SER for Turkey Point was issued on November 10, 2016. The NRC issued the final EIS on October 28, 2016.

On May 2-3, 2017, the ASLB conducted an evidentiary hearing in Homestead, FL, in the contested proceeding involving the Southern Alliance for Clean Energy, National Parks Conservation Association, and other joint intervenors. On July 10, 2017, the ASLB ruled in favor of the NRC staff and terminated the contested proceeding. No appeal was filed within the appeal deadline. On April 18, 2017, the City of Miami, City of South Miami, and Village of Pinecrest (petitioners) filed a new petition seeking a hearing. On July 31, 2017, the ASLB rejected the pending contention and terminated the contested proceeding involving those petitioners. The Commission denied the petitioners' appeal from that decision on December 11, 2017 (CLI-17-12). The Commission held a mandatory hearing on uncontested matters on December 12, 2017.

#### 7. Status of Early Site Permit Applications

##### Clinch River

On May 12, 2016, the Tennessee Valley Authority (TVA) submitted an 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 identified was provided to NRC. By December 15, 2016, TVA had 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 the first week of January 2017 and developed a full review schedule with public milestones that was transmitted to TVA on March 17, 2017. The Phase A review for all chapters of the application was completed by the staff on August 4, 2017 (on the established schedule). The staff is currently in Phase B of its review, which is scheduled to conclude on October 29, 2018. As of November 30, 2017, the staff has issued 39 RAI questions and the applicant has responded to 34 RAI questions. Of the RAI questions issued, 85% are closed or are considered confirmatory items. The final SER is projected to be issued in August 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. On September 12, 2017, the ASLB conducted oral argument on these petitions. On October 10, 2017, the Licensing Board issued a decision that denied the Blue Ridge Environmental Defense League's petition to intervene and granted the Southern Alliance for Clean Energy's and the Tennessee Environmental Coalitions' joint petition to intervene, admitting two contentions. SACE/TEC filed a motion for reconsideration of the Board's dismissal of the third contention and the motion was dismissed by the Board. Separately, TVA appealed the admission of the two contentions to the Commission and that appeal is currently pending before the Commission. The Board is working to schedule the contested hearing for the two admitted contentions.

8. Status of Uranium Recovery Licensing Application Review

<b>Uranium Recovery Applicant</b>	<b>Application Accepted for Review</b>	<b>Review Status</b>
Cameco North Trend Expansion	08/28/07	The applicant requested the NRC staff to stop its review of the North Trend application and to focus its efforts on the review of the Marsland expansion. The SER for the North Trend expansion was completed in July 2013. 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. The current schedule for remaining milestones will be determined after the NRC staff has completed its review for the Marsland expansion.
Uranium One Ludeman Expansion	05/16/12	NRC environmental and safety reviews are in progress for the Ludeman Project, which is an expansion to the existing Willow Creek Project. The licensee is working to resolve safety and environmental issues. NRC met with the licensee on February 22, 2017, to discuss these issues and the licensee's plan to submit an amended application, which addresses a major change of design planned by the licensee. On March 28, 2017, the NRC staff issued a letter to the licensee requesting an updated schedule of when they would submit the required information necessary for the staff to complete its review. In April 2017, the applicant provided all information except for the amended application. The staff received the amended technical report in June 2017 and the amended environmental report in August 2017. The NRC staff is on schedule to complete the SER by March 2018. Based on the amended environmental report, the staff's cultural resources review can now be completed. The NRC staff is on schedule to issue the final EA by August 3, 2018, and reach a decision on the license amendment on August 31, 2018.

Uranium Recovery Applicant	Application Accepted for Review	Review Status
<p>Cameco Smith Ranch License Renewal</p>	<p>07/05/12</p>	<p>Environmental and safety reviews are in progress. Open issues are currently being addressed. On May 2, 2013, the NRC staff issued RAIs on safety and environmental aspects of the renewal request. On April 21, 2015, the licensee submitted its responses to the RAI. The NRC staff is working with the licensee to close remaining open issues. On May 2, 2016, the staff communicated to the licensee that its response to the RAI was incomplete. In December 2016, the staff requested the licensee to provide a schedule for completing its response to the remaining aspects of the RAI. On January 10, 2017, the licensee provided a subsequent update on when it expects to respond to part, but not all, of the NRC staff's RAI. The NRC staff responded to Cameco's letter on April 14, 2017. The NRC staff and Cameco also held the first of several public meetings to address Cameco's development of sufficient RAI responses. The NRC staff's SER completion date of September 2018 and EA completion date of September 2018 are based on receipt of Cameco's RAI responses by January 19, 2018.</p>
<p>Crow Butte Marsland Expansion</p>	<p>10/05/12</p>	<p>Environmental and safety reviews are in progress. The NRC staff issued RAIs in July 2013. The licensee responded in November 2015. After reviewing the responses, the NRC determined that additional information was required to resolve the RAIs. Cameco submitted responses to the open issues in June and August of 2017. At this time, the NRC staff is proceeding with its review and is currently on schedule to complete the SER in January 2018, the final EA in April 2018, and make a final licensing decision in May 2018. The Marsland expansion review has an admitted contention that will go to hearing after completion of the NRC staff's review.</p>

Uranium Recovery Applicant	Application Accepted for Review	Review Status
Hydro Resources, Inc. (HRI) License Renewal	06/24/13	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, at the request of HRI in order to continue 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.
Kennecott Sweetwater License Renewal	11/25/14	The licensee has maintained the facility in stand-by since 1983, waiting on better market conditions to recommence operations. Environmental and safety reviews are in progress. On October 18, 2016, the licensee submitted supplemental information related to groundwater detection monitoring. On November 14, 2016, the licensee submitted revised environmental information. The NRC staff has identified issues with these submittals and will be working with the licensee to resolve them. The issues identified with this revised environmental information affected the projected December 2016 SER completion date, the July 2017 final EA date, and the projected final licensing decision completion date of August 2017. By letter dated July 26, 2017, the licensee identified its schedule for addressing the remaining safety review RAIs. Based on the licensee's schedule, the staff plans to complete its SER and final EA in February 2018. The staff is on schedule to reach a licensing decision in August 2018.
Strata Kendrick Expansion	01/14/16	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. As a result of the licensee's request, the NRC staff is no longer reviewing this licensing action. The staff's safety and environmental reviews, including development of the Supplemental EIS, are on hold.

Uranium Recovery Applicant	Application Accepted for Review	Review Status
Lost Creek KM Horizon/East Expansion	05/02/17	<p>By letter dated February 27, 2017, the applicant resubmitted a revised application. The NRC staff accepted the application for review on May 2, 2017. The NRC staff continues to coordinate with the U.S. 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 the 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 RAI on July 27, 2017, its second RAI on August 28, 2017, and its third RAI on October 30, 2017. The final safety evaluation report is scheduled to be completed in August 2018.</p>
Cameco Three Crow		<p>Three Crow is an expansion of the operating Crow Butte facility located in Crawford, NE. The application was received on August 3, 2010. Staff started its acceptance review on March 3, 2011. The applicant was planning to supplement the application with additional information that was identified by NRC staff during the acceptance review. In November 2014, the applicant requested that the NRC staff place the review on hold and to focus its efforts on the review of the Marsland expansion. The application has not been accepted for review.</p>