[7590-01P]

NUCLEAR REGULATORY COMMISSION

[Docket No. 50-193; NRC–2016–0213]

Rhode Island Atomic Energy Commission

AGENCY: Nuclear Regulatory Commission.

ACTION: Environmental assessment and finding of no significant impact; issuance.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is considering renewal of Facility License No. R-95, held by the Rhode Island Atomic Energy Commission (RIAEC or the licensee), for the continued operation of the Rhode Island Nuclear Science Center Reactor (RINSC reactor or the facility), located in the Narragansett, Washington County, Rhode Island. The NRC is issuing an environmental assessment (EA) and finding of no significant impact (FONSI) associated with the renewal of the license.

DATES: The EA and FONSI are available January 5, 2017.

ADDRESSES: Please refer to Docket ID **NRC–2016–0213** when contacting the NRC about the availability of information regarding this document. You may obtain publicly available information related to this document using any of the following methods:

- **Federal Rulemaking Web Site:** Go to http://www.regulations.gov and search for Docket ID **NRC–2016– 0213**. Address questions about NRC dockets to Carol Gallagher;

telephone: 301–415–3463; e-mail: Carol.Gallagher@nrc.gov. For technical questions, contact the individual listed in the FOR FURTHER INFORMATION CONTACT section of this document.

- **NRC's Agencywide Documents Access and Management System (ADAMS):** You may obtain publicly available documents online in the ADAMS Public Documents collection at *http://www.nrc.gov/reading-rm/adams.html*. To begin the search, select "*ADAMS Public Documents*" and then select "*Begin Web-based ADAMS Search*." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to *pdr.resource@nrc.gov*. For the convenience of the reader, the ADAMS accession numbers are provided in a table in the "Availability of Documents" section of this document.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room OWFN–01F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

FOR FURTHER INFORMATION CONTACT: Patrick G. Boyle, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Rockville, MD 20852. Telephone: 301-415-3936; e-mail: Patrick.Boyle@nrc.gov.

SUPPLEMENTARY INFORMATION:

I. Introduction

The NRC is considering issuance of a renewed Facility Operating License No. R-95, held by RIAEC, which would authorize continued operation of the RINSC reactor, located in Narragansett, Washington County, Rhode Island. As required by Section 51.21 of Title 10 of

the *Code of Federal Regulations* (10 CFR), “Criteria for and identification of licensing and regulatory actions requiring environmental assessments,” the NRC staff prepared an EA documenting its environmental review. Based on the results of the EA that follows, the NRC has determined not to prepare an environmental impact statement for the proposed renewed license and is issuing a FONSI in accordance with 10 CFR 51.32, “Finding of no significant impact.”

II. Environmental Assessment

Facility Site and Environs

The RINSC reactor is located on the University of Rhode Island Narragansett Bay Campus. The RINSC facility consists of one building that houses the reactor and support areas. The confinement section of the reactor building is constructed primarily of concrete, brick, steel, and aluminum. The RINSC site comprises the reactor building and a small area immediately surrounding it, partially bounded by a chain-link fence. Adjacent to the reactor site are athletic facilities to the north and west, fields and parking lots to the east, and academic and research buildings to the south. Surrounding areas are well developed with offsite land use mostly residential in nature. The nearest residences are located approximately 500 meters (1,640 feet) west-northwest and south of the facility.

The RINSC reactor is a pool-type, water moderated and cooled research reactor licensed to operate at a thermal steady-state power level of 2 megawatts (MWt). The reactor was designed to permit later conversion to a steady-state power level of 5 MWt. The fuel is located at the bottom of an aluminum-lined concrete pool with a volume of approximately

40,000 gallons (151,000 liters) and a depth of 32 feet (9.7 m). The reactor is fueled with standard plate-type low-enriched uranium fuel provided by the Department of Energy.

The RINSC reactor uses demineralized water for primary coolant, shielding, and as a reactor moderator and city water for secondary coolant. At power levels below 0.1 MWt, the core can be cooled by natural convection of water through the reactor core and at power levels above 0.1 MWt the core is cooled by forced convection of water through the reactor core. In natural convection mode cooling, heat from the core is transferred to the primary cooling water in the pool where it is dissipated to the surrounding environment. In forced convection mode cooling, heat is transferred from the primary cooling water to two heat exchangers, which pass the heat to the secondary cooling loops, which in turn dissipate the heat to the surrounding environment via two cooling towers. Operation of the primary and secondary cooling systems are checked on a daily basis prior to forced convection reactor operation. During this checkout, the performance of each system is monitored with emphasis on pump outlet pressures, pressure differentials and system flow rates. The licensee conducts periodic tests of the secondary water for sodium-24 which would indicate a leak from the primary water into the secondary water.

During normal operation of the RINSC reactor, the only significant airborne radioactive effluent is Argon-41 (Ar-41). The primary liquid radioactive effluents produced during normal operation include miscellaneous neutron activation products in the primary coolant, many of which are deposited in the mechanical filter and demineralizer resins and, therefore, disposed of as solid radioactive waste. Non-routine liquid radioactive wastes can result from decontamination or maintenance activities, such as filter or resin replacements. Solid radioactive wastes include waste generated from reactor maintenance operations and

laboratory wastes from experiments. Much of the solid radioactive waste generated at the RINSC facility is held in a restricted area and allowed to decay to background levels and then disposed of as non-radioactive waste. Solid radioactive waste that is not decayed in storage is transferred to a low-level waste broker for appropriate disposal.

RIAEC maintains a Radiation Protection Program, which involves regular monitoring of airborne, liquid, and solid gamma and beta radiation to ensure that any effluent releases are within the limits of 10 CFR Part 20, "Standards For Protection Against Radiation." The current environmental program consists of radiation area monitors (RAMs), continuous air monitors (CAMs), portable radiation survey instruments, personnel monitors, and stack gas and particulate monitors. Perimeter monitoring at the RINSC facility consists of Optically-Stimulated Luminescent Dosimeters (OLDs) which detect X-ray and gamma radiation.

A detailed description of the reactor and its operations can be found in the Safety Analysis Report (SAR) for the RINSC reactor submitted by RIAEC with its renewal application.

Description of the Proposed Action

The proposed action would renew Facility Operating License No. R-95 for a period of 20 years from the date of issuance of the renewed license. The proposed action is in accordance with the licensee's application dated May 3, 2004, as supplemented on January 19, February 4, August 6, August 18, September 3, September 8, November 26, December 7, and December 14, 2010; January 24, February 24, and July 15, 2011; March 15, September 16, and December 19, 2013; February 24, April 28, and June 30, 2014; August 7 and August 11, 2015; and January 20, February 26, March 1, April 21, July 20, October 6, November 1, November 14, December 1, December 8, December 13, and December 15, 2016 (collectively referred to as

"the renewal application"). Initially, the operating license was to expire at midnight on August 27, 2002, but a construction time recapture license amendment issued on July 28, 2000 extended the license expiration date to July 21, 2004. Because of the timely renewal provision contained in 10 CFR 2.109(a), the licensee is permitted to continue operation of the reactor under the terms and conditions of its operating license until the license renewal application before the NRC has been finally determined. The proposed renewal would authorize continued operation of the reactor for an additional 20 years from the date of issuance of the renewed license.

Need for the Proposed Action

The proposed action is needed to allow the continued operation of the RINSC reactor to routinely provide teaching, research, and services to numerous institutions for a period of 20 years from the date of issuance of the renewed license.

Environmental Impacts of the Proposed Action

The environmental impacts of the proposed action are discussed below. As discussed below, the proposed action will not have a significant environmental impact. In addition, the proposed action will not require any physical changes to the facility and the impacts are similar to those occurring during past operations.

A. Radiological Impacts

Environmental Effects of Reactor Operations

The only significant gaseous radioactive effluent resulting from the operation of the RINSC reactor is Ar-41. This nuclide is released to the environment from the reactor building from an exhaust stack on the roof that combines the ventilation exhausts from both the main and the purge systems. The stack discharge length is 115 feet (35 meters). Nitrogen-16 (N-16) is also produced during reactor operation, but its release from the reactor stack is insignificant because the half-life of N-16 is approximately 7 seconds and most of the N-16 produced in the reactor coolant would decay before reaching the stack. Therefore Ar-41 is the most significant radionuclide released as a gaseous effluent during normal reactor operations.

The licensee's Technical Specifications require that public doses from Ar-41 not exceed the 100 millirem (mrem) annual public dose limit in 10 CFR 20.1301, "Dose limits for individual members of the public." The Ar-41 release rate would reach a maximum during continuous operation at full power. Historical data shows that the reactor generates approximately 0.14 ± 0.03 Curie (Ci) of Ar-41 per MW hour of operation. Using the Environmental Protection Agency COMPLY computer code, the licensee calculated the dose to the maximally-exposed member of the public located 100 meters (328 feet) from the stack to be 0.021 mrem (0.00021 millisieverts (mSv)) per Ci of Ar-41 released. Using this result, the licensee also calculated that an annual release of 476 Ci of Ar-41 (corresponding to approximately 3,400 MW-hours, or 1,700 hours of operation at full licensed power) from the RINSC reactor would correspond to a maximum public dose of 10 mrem (0.10 mSv) per year. The NRC staff finds the licensee's calculations to be reasonable and conservative. Seven annual operational reports covering the period July 2009 through June 2016 (each annual report covers a July through June reporting period) show that the maximum recorded release of Ar-41 in 1 year was

129.4 Ci, which would result in a dose of 2.7 mrem (0.027 mSv) in 1 year to a member of the public. This is less than 3 percent of the 100 mrem (1 mSv) per year limit specified in 10 CFR 20.1301. The maximum radiation dose of 2.7 mrem (0.027 mSv) in 1 year also demonstrates compliance with the as low as is reasonably achievable (ALARA) air emissions dose constraint of 10 mrem (0.10 mSv) specified in 10 CFR 20.1101, "Radiation protection programs," paragraph(d).

Liquid radioactive wastes are produced as a result of normal operation of the RINSC reactor, and typically consist of miscellaneous neutron activation product impurities in the reactor coolant. Since most of these activation products can be removed from the reactor coolant by collection on the mechanical filters and the demineralizer resins, most of these radioactive materials are typically disposed as solid radioactive sources. While some non-routine liquid radioactive waste could be generated due to decontamination or maintenance activities, the amounts, based on a review of the licensee's past operating experience, as reported in their annual reports, have been and are expected to remain a small volume. Liquid radioactive wastes at the RINSC facility are allowed to decay in storage, are disposed of into the sanitary sewer in accordance with 10 CFR 20.2003, "Disposal by release into sanitary sewerage," or, when necessary, are packaged and transported offsite for disposal. Annual operational reports covering the period July 2009 through June 2016 show that the licensee complied with the limits on discharges to the sanitary sewer in 10 CFR Part 20, Appendix B.

Low-level solid radioactive waste generated from reactor operations typically includes laboratory wastes such as irradiated plastics, contaminated tools, towels, as well as reactor demineralizer resins and particulate filters. Any radioactive waste that contains radionuclides

with half-lives of less than 90 days is allowed to decay in storage and is then disposed of as normal solid waste. Historically, one or two 55-gallon drums of solid waste are generated each year, with the activity being in the microcurie range. This waste is disposed of by a low-level waste broker in accordance with all applicable regulations for transportation of radioactive materials. To comply with the Nuclear Waste Policy Act of 1982, the licensee has entered into a contract with the U.S. Department of Energy (DOE) that provides that DOE retains title to the fuel utilized at RINSC reactor and that DOE is obligated to take the fuel from the site for final disposition.

As described in Chapter 11 of the RINSC reactor SAR, personnel exposures are well within the limits set by 10 CFR 20.1201, "Occupational dose limits for adults," and are ALARA. The licensee tracks exposures of personnel monitored with dosimeters, and exposures are usually less than 10 percent of the occupational limit of 5,000 mrem (50 mSv) per year. Area thermo-luminescent dosimeter monitors mounted in the control room and the reactor bay provide an additional monthly measurement of total radiation exposures at those locations. Annual operational reports covering the period July 2009 through June 2016 show that the personnel doses were well within the 10 CFR 20.1201 limits. No changes in reactor operation that would lead to an increase in occupational dose are expected or proposed as a result of the proposed action.

The radiation monitoring systems associated with reactor operations at the RINSC facility are provided and maintained as a means of ensuring compliance with radiation limits established under 10 CFR part 20, "Standards for Protection against Radiation." The RINSC facility monitoring systems consist of RAMs, CAMs, portable radiation survey instruments,

perimeter monitors, and stack gas and particulate monitors. The stack particulate and gas monitoring systems measure the beta-gamma activity emitted by radioactive particulates and the activity of gaseous radioactive nuclides, respectively, that are exhausted through the RINSC facility stack. Perimeter monitoring at RINSC facility consists of OLDs which detect X-ray and gamma radiation.

The licensee conducts a monitoring program to record and track the radiological impact of reactor operation on the surrounding unrestricted area. The program consists of quarterly exposure measurements at three locations outside the reactor building using OLDs. The licensee then applies an occupancy factor to determine the final exposure measurement. The licensee's radiation safety officer administers the program and maintains the appropriate records. Annual operational reports covering the period July 2009 through June 2016 show that radiation exposures at the monitoring locations were below the limits to the public as required by 10 CFR Part 20. Year-to-year trends in exposures are consistent between monitoring locations. Also, no correlation exists between total annual reactor operation and annual exposures measured at the monitoring locations. Based on review of data for the years 2009 through 2016, the NRC staff finds that operation of the RINSC reactor does not have any significant radiological impact on the surrounding environment. No changes in reactor operation that would affect off-site radiation levels are expected or proposed as a result of the proposed action.

Because occupational and public exposures are below regulatory limits, the NRC staff concludes that the proposed action would not have a significant radiological impact.

Environmental Effects of Accidents

Accident scenarios are discussed in Chapter 13 of the RINSC SAR. The accidents analyzed in Chapter 13 cover a range of anticipated events, including a postulated accident involving a fission product release with radiological consequences that exceed those of any accident considered to be credible. This limiting accident is referred to as the maximum hypothetical accident (MHA). The licensee considers the uncontrolled release of the gaseous fission products from a fissionable experiment to be the MHA. In the scenario used by the licensee, an experiment containing fissionable material fails, and the gaseous fission products in the experiment are released into the air of the reactor building. From the reactor building, the release would continue to the environment. The licensee calculated doses to facility personnel during a five minute evacuation duration, and also calculated the dose to a member of the public outside the facility during the two hours it would take the entire plume of released radioactive material to pass. The licensee estimated an occupational dose of 1,570 mrem (15.7 mSv), and a dose of 100 mrem (1 mSv) to the maximally-exposed member of the public. The NRC staff reviewed the licensee's calculations, and found them to be generally reasonable and acceptable. The NRC staff also performed independent calculations to verify that the licensee's calculated doses represented conservative estimates for the MHA. The NRC staff estimated an occupational dose of 4,100 mrem (41.0 mSv), and a dose of 88 mrem (0.88 mSv) to the maximally-exposed member of the public. The details of these calculations are provided in the safety evaluation report that the NRC staff is preparing to document the safety review of the application for a renewed license. The NRC staff estimates that the occupational radiation doses resulting from the postulated MHA would be below the 10 CFR 20.1201 limit of 5,000 mrem (50 mSv). The NRC staff also estimates that the maximum radiation doses for

members of the public resulting from the postulated MHA would be at or below the 10 CFR 20.1301 limit of 100 mrem (1 mSv).

The licensee has systems in place for controlling the release of radiological effluents, and implements a radiation protection program to monitor personnel exposures and releases of radioactive effluents. The licensee's systems and radiation protection program are appropriate for the types and quantities of effluents expected to be generated by continued operation of the reactor. The NRC also staff evaluated information contained in the licensee's renewal application and data the licensee reported to the NRC for the last 7 years of operation to determine the projected radiological impact of the facility on the environment during the period of the renewed license. The NRC staff finds that releases of radioactive material and personnel exposures were all well within applicable regulatory limits. Because the licensee has not requested any changes to the facility design or operating conditions as part of the application for license renewal, the proposed action would not significantly increase the probability or consequences of accidents, would not significantly change the types or quantities of effluents that may be released off-site, and would not significantly increase individual or cumulative occupational or public radiation exposure. Based on its evaluation, the NRC staff concludes that continued operation of the reactor would not have a significant environmental impact.

B. Non-Radiological Impacts

The proposed action does not involve any change in the operation of the reactor, change in the emissions or heat load dissipated to the environment, or construction or other land disturbance activities. The proposed action would not result in any land use changes or increase in noise or air emissions, and would not have a significant impact on air quality, noise

or visual, terrestrial or aquatic resources. The proposed license renewal would not affect surface water or groundwater resources, because water is supplied through the city and no changes in facility operations are proposed. Heat produced cooling the reactor is ultimately disposed to the environment through the secondary cooling system and cooling tower. There are no increased thermal effects on the environment in the proposed action. The licensee uses no chemical treatments in the secondary cooling system. Hazardous chemicals may be used in experiments at the RINSC facility, but no releases of potentially hazardous chemicals to the environment occur during normal facility operation. Disposal of non-radioactive waste, including hazardous chemicals, generated by individuals associated with the University of Rhode Island, is conducted by the campus Department of Safety and Risk Management in accordance with EPA regulations. The Safety and Risk Management organization provides training for users, performs inspections, and complies with OSHA and EPA regulations. Therefore, the NRC staff concludes that the proposed action would have no significant non-radiological impacts.

Other Applicable Environmental Laws

In addition to the National Environmental Policy Act, which requires Federal agencies to consider the environmental impacts of proposed actions, the NRC has responsibilities that are derived from other environmental laws, which include the Endangered Species Act, Coastal Zone Management Act, Fish and Wildlife Coordination Act, National Historic Preservation Act, and Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.” The following presents a brief discussion of impacts associated with resources protected by these laws and related requirements.

1. Endangered Species Act (ESA)

The ESA was enacted to prevent further decline of endangered and threatened species and restore those species and their critical habitat. Section 7 of the ESA requires Federal agencies to consult with the U.S. Fish and Wildlife Service (FWS) or National Marine Fisheries Service (NMFS) regarding actions that may affect listed species or designated critical habitats.

The NRC staff conducted a search of federally listed species and critical habitats that have the potential to occur in the vicinity of the RINSC facility using the FWS's Environmental Conservation Online System Information for Planning and Conservation system. Eight Federally listed species occur in Washington County: the American burying beetle (*Nicrophorus americanus*), hawksbill sea turtle (*Eretmochelys imbricata*), leatherback sea turtle (*Dermochelys coriacea*), northern long-eared bat (*Myotis septentrionalis*), piping plover (*Charadrius melodus*), red knot (*Calidris canutus rufa*), roseate tern (*Sterna dougallii dougallii*), and sandplain gerardia (*Agalinis acuta*). However, none of these species are likely to occur near the RINSC reactor because the facility is located on the University of Rhode Island Narragansett Bay Campus, which does not provide suitable habitat for Federally listed species because it has been developed, and in use, for research and educational purposes for many decades. Additionally, operation of the RINSC reactor has no direct nexus to the natural environment that could otherwise affect federally listed species. Accordingly, the NRC staff concludes that the proposed license renewal of the RINSC reactor would have no effect on federally listed species or critical habitats. Federal agencies are not required to consult with the FWS if they determine that an action will not affect listed species or critical habitats (ADAMS Accession No. ML16120A505). Thus, the ESA does not require consultation for the proposed RINSC

reactor license renewal, and the NRC staff considers its obligations under ESA Section 7 to be fulfilled for the proposed action.

2. Coastal Zone Management Act (CZMA)

The CZMA, in part, encourages States to preserve, protect, develop, and restore coastal resources. Applicants for Federal licenses to conduct an activity that affects any land or water use or natural resource of the coastal zone of a state must provide a certification in that the proposed activities complies with the State's approved coastal zone management program and will conduct activities consistent with that program.

Rhode Island's approved coastal zone includes the area encompassed within the State's seaward boundary (3 miles (4.8 kilometers)) to the inland boundaries of the State's 21 coastal municipalities, of which Narragansett is one. Although the RINSC reactor is located within the State's coastal zone, the proposed license renewal is not reasonably likely to affect any land or water use or natural resource of the coastal zone, and thus, the CZMA consistency certification process does not apply. Therefore, the NRC staff finds that the licensee does not need to provide a certification under the CZMA.

3. Fish and Wildlife Coordination Act (FWCA)

The FWCA requires Federal agencies that license water resource development projects to consult with the FWS (or NMFS, when applicable) and the State wildlife resource agencies regarding the potential impacts of the project on fish and wildlife resources.

The proposed license renewal does not involve any water resource development projects, including any of the modifications relating to impounding a body of water, damming, diverting a stream or river, deepening a channel, irrigation, or altering a body of water for

navigation or drainage. Therefore, no coordination with other agencies pursuant to the FWCA is required for the proposed action.

4. National Historic Preservation Act (NHPA)

The NHPA requires Federal agencies to consider the effects of their undertakings on historic properties. As stated in the Act, historic properties are any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the National Register of Historic Places (NRHP).

The NRHP lists one historic property on the University of Rhode Island Narragansett Bay Campus, the Narragansett Baptist Church. The location of the Narragansett Baptist Church is approximately 1,000 feet (304.8 meters) northwest of the RINSC facility. Operation of the RINSC reactor has not likely had any impact on this property. A request for a Section 106 project review was submitted to the State Historic Preservation Officer (SHPO) regarding this undertaking and determination. By letter dated December 19, 2013, the Rhode Island SHPO concurred that this action would not affect any historic properties (ADAMS Accession No. ML14006A420). Based on this information, the NRC staff finds that the proposed license renewal and the continued operation of the RINSC reactor would have no adverse effect on historic properties located near the RINSC reactor.

5. Executive Order 12898 – Environmental Justice

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," 59 FR 7629 (February 16, 1994), directs agencies to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law.

The environmental justice impact analysis evaluates the potential for disproportionately high and adverse human health and environmental effects on minority and low-income populations that could result from the relicensing and the continued operation of the RINSC reactor. Such effects may include human health, biological, cultural, economic, or social impacts. Minority and low-income populations are subsets of the general public residing around the RINSC reactor, and all are exposed to the same health and environmental effects generated from activities at the RINSC reactor.

Minority Populations in the Vicinity of the RINSC Reactor—According to the U.S. Census Bureau's 2010 Census, approximately 12 percent of the total population (approximately 125,000 individuals) residing within a 10-mile radius of the RINSC reactor identified themselves as minorities. The largest minority populations were Hispanic, Latino, or Spanish origin of any race (approximately 4,900 or 4 percent) followed by Black or African American (approximately 3,700 or 3 percent). According to the 2010 Census, 7.6 percent of the Washington County population identified themselves as minorities, with persons of Hispanic, Latino, or Spanish origin of any race, Asians, and Black or African Americans comprising the largest minority populations (2.4 percent, 2.1 percent, and 2.0 percent, respectively). According to the U.S. Census Bureau's 2015 American Community Survey 1-year Estimates, the minority population of Washington County, as a percent of the total population, had increased to about 9 percent.

Low-income Populations in the Vicinity of the RINSC Reactor—According to U.S. Census Bureau's 2010–2014 American Community Survey 5-Year Estimates, approximately 11,000 persons and 1,500 families (approximately 10 and 5 percent, respectively) residing within a 10-mile radius of the RINSC reactor were identified as living

below the Federal poverty threshold. The 2014 Federal poverty threshold was $24,230 for a family of four. According to the U.S. Census Bureau's 2015 American Community Survey Census 1-Year Estimates, the median household income for the State of Rhode Island was $58,073 while approximately 10 percent of families and 14 percent of the state population were found to be living below the Federal poverty threshold. Washington County had a higher median household income average ($72,453) and a lower percent of families (8 percent) and persons (10 percent) living below the poverty level, respectively.

Impact Analysis—Potential impacts to minority and low-income populations would mostly consist of radiological effects; however, radiation doses from continued operations associated with the proposed license renewal are expected to continue at current levels, and would be below regulatory limits. No significant visual or noise impacts are expected to result from the proposed action. Based on this information and the analysis of human health and environmental impacts presented in this EA, the proposed license renewal would not have disproportionately high and adverse human health and environmental effects on minority and low-income populations residing in the vicinity of the RINSC reactor.

Environmental Impacts of the Alternatives to the Proposed Action

As an alternative to license renewal, the NRC considered denying the proposed action (i.e., the "no-action" alternative). If the NRC denied the request for license renewal, reactor operations would cease and decommissioning would be required (sooner than if a renewed license were issued) and the environmental effects of decommission would occur. Decommissioning would be conducted in accordance with an NRC-approved decommissioning

plan, which would require a separate environmental review under 10 CFR Part 51.21. Cessation of reactor operations would reduce or eliminate radioactive effluents. However, as previously discussed in this EA, radioactive effluents from reactor operations constitute a small fraction of the applicable regulatory limits. Therefore, the environmental impacts of license renewal and the denial of the request for license renewal would be similar. In addition, denying the request for license renewal would eliminate the benefits of teaching, research, and services provided by the RINSC reactor.

Alternative Use of Resources

The proposed license renewal does not involve the use of any different resources or significant quantities of resources beyond those previously considered in the issuance of Facility License No. R-95 on July 21, 1964, which authorized RIAEC to operate the RINSC reactor, the license amendment issued on September 10, 1968, which authorized operation up to a maximum of 2 MWt, and the license amendment issued on March 17, 1993, which authorized the conversion from highly-enriched uranium fuel to low-enriched uranium fuel in the RINSC reactor.

Agencies and Persons Consulted

With the exception of the Rhode Island SHPO as previously described in this EA, the NRC staff did not enter into consultation with any other Federal agencies or with the State of Rhode Island regarding the environmental impact of the proposed action. However, on December 20, 2016, the NRC notified the Rhode Island State official, Mr. Paul D'Abbraccio, Radiological Emergency Preparedness Program Manager, of the Rhode Island Emergency

Management Agency of the proposed action. Mr. Paul D'Abbraccio responded by e-mail on December 22, 2016 and had no comments.

III. Finding of No Significant Impact

The NRC is considering issuance of a renewed Facility License No. R-95, held by the RIAEC, which would authorize the continued operation of the RINSC reactor for an additional 20 years from the date of issuance of the renewed license.

On the basis of the EA included in Section II of this notice and incorporated by reference in this finding, the NRC staff finds that the proposed action will not have a significant impact on the quality of the human environment. The proposed action would result in no significant impacts on terrestrial, surface or groundwater resources, or the radiological environment. In addition, the proposed action will not affect Federally-protected species or affect any designated habitat. The NRC staff's evaluation considered information provided in the licensee's application, as supplemented, and the NRC staff's review of related environmental documents. Section IV below lists the environmental documents related to the proposed action and includes information on the availability of these documents. Accordingly, the NRC has determined not to prepare an environmental impact statement for the proposed action.

IV. Availability of Documents

The following table identifies the references cited in this document and related to the NRC's FONSI. These documents are available for public inspection online through ADAMS at http://www.nrc.gov/reading-rm/adams.html or in person at the NRC's PDR as described previously.

Document	ADAMS Accession No.
"Rhode Island Atomic Energy Commission – 'Requesting Renewal of Operating License R-095 (Enclosure 2)' [REDACTED Safety Analysis Report]," May 3, 2004	ML14038A386
"Rhode Island Atomic Energy Commission, Requesting Renewal of Operating License R-095," May 3, 2004	ML041270519
"Response to Request for Additional Information Concerning Plans for Decommissioning Facility at the End of Useful Life Ref Item 3 Parts a, b, and c," January 19, 2010	ML100270176
"Rhode Island Nuclear Science Center, Appendix A to Safety Analysis Report, Information on Ar-41 and N-16," (received December 5, 2016), February 4, 2010	ML16340A068
"Rhode Island Nuclear Science Center Reactor Submittal of Response to Request for Additional Information Re License Renewal," August 6, 2010	ML102240257
"Responding to Requests for Additional Information (RAI) regarding our Analysis of the Maximum Hypothetical Accident (MHA) for Renewal of License R-95," August 18, 2010	ML102360440
"Memorandum Steady-State Thermal-Hydraulic Analysis for Forced-Convective Flow in the Rhode Island Nuclear Science (RINSC) Reactor," September 3, 2010	ML16062A376
"Rhode Island Atomic Energy Commission, Fourth Response to Request for Additional Information dated April 23, 2010 (Redacted)," September 8, 2010	ML16279A516

Document	ADAMS Accession No.
“Rhode Island Atomic Energy Commission Fifth Response to April 13, 2010 Request for Additional Information (Regarding License Renewal redacted),” November 26, 2010	ML16279A518
“Rhode Island Atomic Energy Commission - Response to Requests for Additional Information Regarding Aging Issues Raised in RAIs,” December 7, 2010	ML103490242
“Rhode Island Atomic Energy Commission Response to April 13, 2010, Request for Additional Information Regarding License Renewal Technical Specifications (Redacted),” December 14, 2010	ML16279A519
“Reply to your Request for Additional Information (RAI) dated April 13, 2010, regarding License Renewal for the Rhode Island Nuclear Science Center Reactor (RINSC),” January 24, 2011	ML110320416
“Letter re: Request for Additional Information dated April 13, 2010 Regarding License Renewal for the Rhode Island Nuclear Science Center Reactor (RINSC),” February 24, 2011	ML110600699
“Rhode Island Atomic Energy Commission Response to Request for Additional Information Regarding License Renewal,” July 15, 2011	ML11202A287
“Rhode Island Atomic Energy Commission Tenth Response to the April 13, 2010, Request for Additional Information Regarding License Renewal (Redacted),” July 15, 2011	ML16279A520
“Rhode Island Atomic Energy Commission Responses to Request for Additional Information Regarding License Renewal (Redacted),” July 15, 2011	ML16279A521
“Rhode Island Nuclear Science Center Tenth Response to NRC Request for Additional Information dated April 13, 2010, Pages 126 Through 204,” July 15, 2011	ML11202A290
“Response to NRC's Request for Additional Information Regarding Rhode Island Nuclear Science Center Reactor License Renewal,” March 15, 2013	ML13080A361
“Response to NRC’s Request for Additional Information Regarding Rhode Island Nuclear Science Center Reactor License Renewal,” March 15, 2013	ML13080A362
“Response to NRC's Request for Additional Information Regarding Rhode Island Nuclear Science Center Reactor License Renewal, Proposed Technical Specification 130314,” March 15, 2013	ML13080A364
“Response to Request for Additional Information Regarding Financial Qualifications for the RINSC Reactor License Renewal,” September 16, 2013	ML13260A474

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Dated at Rockville, Maryland, this 27th day of December, 2016.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

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Research and Test Reactors Branch
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