



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 30, 2021

Dr. David M. Slaughter, President
and Reactor Administrator
Aerotest Operations, Inc.
3455 Fostoria Way
San Ramon, CA 94583

SUBJECT: AEROTEST OPERATIONS, INC. – REQUEST FOR ADDITIONAL
INFORMATION RE: POSSESSION-ONLY LICENSE AMENDMENT REQUEST
FOR THE AEROTEST RADIOGRAPHY AND RESEARCH REACTOR FACILITY
OPERATING LICENSE NO. R-98 (EPID NO. L-2019-LLA-0065)

Dear Dr. Slaughter:

By letter dated March 21, 2019 (Agencywide Documents Access and Management System Accession No. ML19084A051), as supplemented, Aerotest Operations, Inc. (the licensee) submitted a license amendment request (LAR) to modify Facility Operating License No. R-98 for the Aerotest Radiography and Research Reactor (ARRR) to a possession-only license in support of the licensee's decision to permanently cease operation of the ARRR.

The U.S. Nuclear Regulatory Commission (NRC) staff identified additional information needed to continue its review of the LAR, as described in the enclosed request for additional information (RAI). As discussed by telephone call with you on March 29, 2021, provide a response to the RAI or a written request for additional time to respond, including the proposed response date and a brief description of the reason, by 30 days from the date of this letter. Following receipt of the complete response to the RAI, the NRC staff will continue its review of the LAR.

The response to the RAI must be submitted in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 50.4, "Written communications," and, pursuant to 10 CFR 50.30(b), "Oath or affirmation," be executed in a signed original document under oath or affirmation. Information included in the response that you consider sensitive or proprietary, and seek to have withheld from public disclosure, must be marked in accordance with 10 CFR 2.390, "Public inspections, exemptions, requests for withholding." Any information related to safeguards should be submitted in accordance with 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

If you have any questions regarding the NRC staff's review or if you intend to request additional time to respond, please contact me at 301-415-0893, or by electronic mail at Geoffrey.Wertz@nrc.gov.

Sincerely,

Geoffrey A. Wertz, Project Manager
Non-Power Production and Utilization
Facility Licensing Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Docket No. 50-228
License No. R-98

Enclosure:
As stated

cc:

California Energy Commission
1516 Ninth Street, MS-34
Sacramento, CA 95814

Radiologic Health Branch
P.O. Box 997414, MS 7610
Sacramento, CA 95899-7414

Test, Research and Training
Reactor Newsletter
Attention: Ms. Amber Johnson
Dept. of Materials Science and Engineering
University of Maryland
4418 Stadium Drive
College Park, MD 20742-2115

SUBJECT: AEROTEST OPERATIONS, INC. – REQUEST FOR ADDITIONAL
INFORMATION RE: POSSESSION-ONLY LICENSE AMENDMENT REQUEST
FOR THE AEROTEST RADIOGRAPHY AND RESEARCH REACTOR FACILITY
OPERATING LICENSE NO. R-98 (EPID NO. L-2019-LLA-0065)
DATED: March 30, 2021

DISTRIBUTION:

PUBLIC

NParker, NRR

JNguyen, NRR

JWachutka, OGC

ZCruz-Perez, NMSS

GWertz, NRR

EReed, NRR

BWatson, NMSS

KRoche, NRR

TTate, NRR

DHardesty, NRR

EHelvenston, NRR

BSmith, NRR

PTorres, NRR

RidsOcfMailCenter Resource

ADAMS Accession No.: ML21047A468**NRR-088**

OFFICE	NRR/DANU/UNPL/PM	NRR/DANU/UNPL/LA	OGC/NLO
NAME	GWertz	NParker	JWachutka
DATE	2/17/2021	2/18/2021	3/02/2021
OFFICE	NRR/DANU/UNPL/ABC	NRR/DANU/UNPL/PM*	
NAME	DHardesty	GWertz	
DATE	3/04/2021	3/30/2021	

OFFICIAL RECORD COPY

OFFICE OF NUCLEAR REACTOR REGULATION
REQUEST FOR ADDITIONAL INFORMATION
REGARDING AMENDMENT FOR A POSSESSION-ONLY LICENSE
FACILITY OPERATING LICENSE NO. R-98
AEROTEST OPERATIONS, INC.
AEROTEST RADIOGRAPHY AND RESEARCH REACTOR
DOCKET NO. 50-228

The U.S. Nuclear Regulatory Commission (NRC, the Commission) staff is continuing its review of the Aerotest Operations, Inc. (Aerotest, the licensee) license amendment request (LAR), provided by letter dated March 21, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19084A051), as supplemented, to modify Facility Operating License No. R-98 and its supporting technical specifications (TSs) to a possession-only license (POL) in support of the licensee's decision to permanently cease operation of the Aerotest Radiography and Research Reactor (ARRR). These requests for additional information have been developed based on the following requirements and guidance applicable to the LAR:

- The regulations in Title 10 of the *Code of Federal Regulations* (10 CFR) 50.9, "Completeness and accuracy of information," require that information provided to the Commission by a licensee be complete and accurate in all material respects.
- The regulations in 10 CFR 2.390, "Public inspections, exemptions, requests for withholding," provide requirements for withholding information from public disclosure.
- The regulations in 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material," provide requirements for the licensing of receipt, possession, and use of special nuclear material (SNM).
- The regulations in 10 CFR Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," provide requirements for licensing byproduct material.
- The regulations in 10 CFR 50.82, "Termination of license," provide requirements for license termination.
- NUREG-1537, Part 1, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors, Format and Content," Chapter 17, "Decommissioning and Possession-Only License Amendments," Section 17.2.1.2, "Technical Specifications," and Chapter 14, "Technical Specifications," Appendix 14.1, "Format and Content of Technical Specifications for Non-Power Reactors," dated February 1996 (ADAMS Accession No. ML042430055) and NUREG-1537, Part 2, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors, Standard Review Plan and Acceptance Criteria," Chapter 17,

Enclosure

“Decommissioning and Possession-Only License Amendments,” Section 17.2.1.2, “Technical Specifications,” dated February 1996 (ADAMS Accession No. ML042430048), provide guidance for the content of TSs, and state that the NRC staff will review the proposed TSs to ensure that they are complete and comprehensive.

- American National Standards Institute/American Nuclear Society (ANSI/ANS)-15.1-2007 (Reaffirmed (R) 2013), “The Development of Technical Specifications for Research Reactors,” Section 6, “Administrative controls,” provides guidance used by the NRC staff, including definitions, parameters, and operating characteristics of a research reactor that should be included in the TSs.
- Aerojet-General Nucleonics Industrial Reactor Hazards Summary Report, dated September 1964 (ADAMS Accession No. ML19192A162).

As a result of the licensee’s request to amend its license and TSs, the NRC staff performed a comprehensive review of the proposed license and TSs using the guidance in NUREG-1537, Part 2 and identified the following requests for additional information (RAIs).

Note: The licensee-provided license conditions (LCs) and TSs reproduced below are taken from the licensee’s supplemental letter dated June 8, 2020 (ADAMS Accession No. ML20175A676) and are identified by *italic text*. Any NRC staff suggested changes to the language of the LCs and TSs do not indicate NRC approval of the changed language; LC and TS language is only approved by an approved and issued license amendment.

RAIs – License Conditions

1. The regulations in 10 CFR Part 70 provide for the licensing of receipt, possession, and use of SNM.

The licensee proposed to revise LC 2.B.(2) to read:

Pursuant to the Act and 10 CFR Part 70, “Special Nuclear Material,” to possess up to 5.0 kilograms of contained uranium 235, and

The NRC staff reviewed the proposed LC 2.B.(2) and suggests changes to it for clarity and accuracy. Specifically, the NRC staff suggests adding the language “but not receive, use, or separate” such that the LC would clearly indicate that these activities are not permitted for uranium 235 or other SNM. Additionally, the NRC staff suggests adding language to allow the possession of SNM produced by past operation of the ARRR and of SNM in irradiated Training, Research, Isotopes, General Atomics (TRIGA) fuel elements transferred to the ARRR from other reactor facilities, to make the LC more comprehensive, since Aerotest currently possesses these materials (e.g., in its proposed ARRR restart plan previously submitted by letter dated April 3, 2018 (ADAMS Accession No. ML18096A689), the licensee stated that some of its aluminum-clad fuel elements were previously irradiated when received). The proposed LC 2.B.(2) with the NRC staff’s suggested changes would read:

Pursuant to the Act and 10 CFR Part 70, “Special Nuclear Material,” to possess, but not receive, use, or separate, up to 5.0 kilograms of contained uranium-235, such special nuclear material as may have been produced by previous operation of the reactor, and such special nuclear material (in TRIGA fuel elements)

produced by operation of other reactors as may have been previously transferred to Facility Operating License No. R-98; and

Confirm that the proposed LC 2.B.(2), including the NRC staff's suggested changes, is correct and appropriately reflects the status of the ARRR, and that Aerotest agrees with the suggested changes. Alternatively, propose and justify alternate language for LC 2.B.(2).

2. The regulations in 10 CFR Part 30 provide for the licensing of receipt, possession, and use of byproduct material.

The licensee proposed to revise LC 2.B.(3) to read:

Pursuant to the Act and 10 CFR Part 30, "Licensing of Byproduct Material," (1) to possess, and 2 curie americium-beryllium neutron startup source, and (2) to possess, but not to separate, such byproduct material.

The NRC staff reviewed the proposed LC 2.B.(3) and suggests changes to it for clarity and accuracy. Specifically, the NRC staff suggests adding the language "but not receive" and "use" such that the LC would clearly indicate that these activities are not permitted for the americium-beryllium source or the byproduct material produced by previous operation of the ARRR (e.g., fission products in fuel, and activation products in reactor structural materials). The NRC staff also suggests adding language clarifying that "such byproduct material" in item (2) of LC 2.B.(3) refers to byproduct material produced by previous operation of the ARRR. Additionally, the NRC staff suggests adding language to allow the possession of byproduct material in irradiated TRIGA fuel elements transferred to the ARRR from other reactor facilities, to make the LC more comprehensive, since Aerotest currently possesses these materials. The NRC staff also suggests correcting apparent typographical errors in the proposed LC. The proposed LC 2.B.(3), with the NRC staff's suggested changes, would read:

Pursuant to the Act and 10 CFR Part 30, "Licensing of Byproduct Material," (1) to possess, but not receive or use, a 2 curie americium-beryllium neutron startup source, (2) to possess, but not receive, use, or separate, such byproduct material as may have been produced by previous operation of the reactor, and (3) to possess, but not receive, use, or separate, such byproduct material (in TRIGA fuel elements) produced by operation of other reactors as may have been previously transferred to Facility Operating License No. R-98.

Confirm that the proposed LC 2.B.(3), including the NRC staff's suggested changes, is correct and appropriately reflects the status of the ARRR, and that Aerotest agrees with the suggested changes. Alternatively, propose and justify alternate language for LC 2.B.(3).

3. The licensee proposed to revise LC 2.C.(3) to read:

Physical Security Plan

The licensee shall maintain in effect and fully implement all provisions of the NRC-approved physical security plan, including amendments and changes made pursuant to the authority of 10 CFR Section 50.54(p). The approved security plan consists of the document withheld from public disclosure pursuant to 10 CFR 2.390, entitled "Aerotest Operations, Inc. Security Plan".

The NRC staff reviewed the proposed LC 2.C.(3) and suggests changes to it for clarity and accuracy. Specifically, the NRC staff suggests changing the reference to "10 CFR 2.390" to a reference to "10 CFR 73.21," because, as noted in the licensee's letter submitting the ARRR physical security plan (PSP), dated September 28, 2020 (ADAMS Accession No. ML20276A247), the PSP is withheld from disclosure as Safeguards Information-Modified Handling (SGI-M), and 10 CFR 73.21, not 10 CFR 2.390, is the regulation applicable to SGI-M. Additionally, the NRC staff suggests adding to the LC the date of the NRC-approved PSP (i.e., October 1, 2020). The inclusion of this date would not prevent the licensee from revising its PSP pursuant to 10 CFR 50.54, "Conditions of licenses," paragraph (p)(2) without the need to submit an LAR to the NRC, because, by its own terms, the LC requires that the licensee maintain in effect and fully implement this PSP, including amendments and changes made pursuant to 10 CFR 50.54(p). The proposed LC 2.B.(3), with the NRC staff's suggested changes, would read:

Physical Security Plan

The licensee shall maintain in effect and fully implement all provisions of the NRC-approved physical security plan, including amendments and changes made pursuant to the authority of 10 CFR 50.54(p). The approved security plan consists of the document withheld from public disclosure pursuant to 10 CFR 73.21 entitled, "Aerotest Operations, Inc. Security Plan," dated October 1, 2020.

Confirm that the proposed LC 2.C.(3), including the NRC staff's suggested changes, is correct and appropriately reflects the status of the ARRR, and that Aerotest agrees with the suggested changes. Alternatively, propose and justify alternate language for LC 2.C.(3).

4. Within the LAR, the licensee requested to replace the ARRR's NRC-licensed operators with certified fuel handlers (CFHs) and replace the ARRR's Operator Requalification Program (ORP) with a CFH Training and Requalification Program (CFHTRP). Although 10 CFR 50.2, "Definitions," defines CFH for a nuclear power reactor facility as a non-licensed operator who has qualified in accordance with a fuel handler training program approved by the Commission, there are no regulatory requirements related to CFHs and CFHTRPs applicable to non-power reactors such as the ARRR. Therefore, because the licensee's implementation of its proposed CFHTRP would form part of the NRC staff's basis for an approval of the licensee's proposed elimination of NRC-licensed operators and its ORP while fuel is still present at the facility, the NRC staff suggests adding an additional LC 2.C.(4), which would require the licensee to maintain in effect and fully implement its CFHTRP. This LC would also allow the licensee to make changes to an NRC-approved CFHTRP as proposed in Aerotest's CFHTRP. Additionally, because the ARRR would no longer have NRC-licensed senior reactor operators and because it is not a nuclear power reactor, the LC would also allow the ARRR's CFHs to approve licensee action permitted by 10 CFR 50.54(x). The NRC staff's suggested LC 2.C.(4) would read:

Certified Fuel Handler Training and Requalification Program

Whenever the licensee possesses TRIGA fuel elements pursuant to License Condition 2.B.(2), the licensee shall maintain in effect and fully implement all provisions of the NRC-approved Certified Fuel Handler Training and Requalification Program, including changes made to the program without NRC

approval as permitted by the program. The approved program consists of the document entitled, "ARRR CFH Training/Requalification Program," dated [DATE], 2021. Certified Fuel Handlers qualified in accordance with the program may approve licensee action permitted by 10 CFR 50.54(x).

Confirm that the proposed LC 2.C.(4) is correct and appropriately reflects the status of the ARRR, and that Aerotest agrees with the suggested addition of the LC. Alternatively, propose and justify alternate language for LC 2.C.(4).

5. The regulations in 10 CFR 50.51, "Continuation of license," paragraph (b) state, in part, that "[e]ach license for a facility that has permanently ceased operations, continues in effect beyond the expiration date to authorize ownership and possession of the production or utilization facility, until the Commission notifies the licensee in writing that the license is terminated." Consistent with this, the guidance in NUREG-1537, Part 1, Section 17.2.1.1, states that POL amendments should not change the expiration date of the license.

The licensee proposed to revise current LC 2.F, which states that the ARRR license expires at midnight on April 16, 2005, to state that the license expires at midnight on December 5, 2024. The licensee stated that this date is based on the estimated license termination date from its draft decommissioning plan (DP). However, this change does not appear to be necessary or appropriate, given the regulations in 10 CFR 50.51(b) and the guidance in NUREG-1537, Part 1.

Confirm that Aerotest no longer proposes to revise current LC 2.F, propose and justify alternate language for LC 2.F, or justify why no additional information is required.

RAIs – Technical Specifications

- 5.1 The licensee proposed to revise TS 1.1 to read:

Permanent Shutdown

The reactor is permanently shut down when the reactor is maintained in permanent shut down configuration with the fuel elements stored in storage racks that maintain a criticality of equal to or less than 0.8 k_{eff} .

The NRC staff notes that the phrase "with the fuel elements stored in storage racks that maintain a criticality of equal to or less than 0.8 k_{eff} " is not clear. Therefore, the NRC staff suggests deleting this phrase.

The proposed TS 1.1, with the NRC staff's suggested deletion, would read:

Permanent Shutdown

The reactor is permanently shut down when the reactor is maintained in permanent shut down configuration.

Confirm that the proposed TS 1.1, including the NRC staff's suggested deletion, is correct and appropriately reflects the status of the ARRR, and that Aerotest agrees with the suggested deletion. Alternatively, propose and justify alternate language for TS 1.1.

6. The licensee proposed to revise TS 2.3 to read:

Th[e] principal activities carried on within the exclusion area shall be those associated with the decommissioning of the ARRR reactor and the use of machine shop, electrical shop and chemistry laboratory.

- 6.1. The NRC staff notes that the word “Th” is misspelled. The NRC staff suggests changing this to “The”.
- 6.2. The NRC staff finds the word “reactor,” which follows the acronym “ARRR” to be redundant and suggests deletion.
- 6.3. The NRC staff suggests adding the word “the” prior to “machine shop,” “electrical shop,” and “chemistry laboratory” to improve clarity.
- 6.4. The NRC staff notes that it is not clear as to what specific activities are described by the statement “principal activities ... associated with the decommissioning of the ARRR...” Provide a description, within TS 2.3, of those activities associated with the decommissioning of the ARRR and a justification for performing those activities, or justify why no changes are needed.
- 6.5. The NRC staff notes that it is not clear why the machine shop and the electrical shop were added to TS 2.3. Delete these facilities from TS 2.3 or provide a basis for their inclusion to justify why no changes are needed.

7. The licensee proposed to revise TS 3.1.2 to read:

Ventilation shall be achieved by gravity ventilators located in the roof of the building, and

The NRC staff notes that this revision would replace “on the roof” with “in the roof,” but this proposed change was not described or justified in the LAR. Change “in” back to “on” or else provide a justification for the proposed change.

8. The licensee proposed to revise TS 3.2 to read:

An alarm system shall be installed to detect unauthorized entry into the reactor building. The alarm system shall be monitored constantly and its annunciation shall be tested monthly.

The NRC staff notes that this information is provided in another licensing basis document and, therefore, should be removed. Delete TS 3.2 or justify why no changes are needed.

9. The licensee proposed to revise TS 4.2 to read:

The conductivity of the primary coolant shall be measured at least once quarterly. Corrective action shall be taken to avoid exceeding a conductivity of 5 umho/cm.

The NRC staff notes that the proposed revision changes the periodicity of the conductivity measurement from monthly to quarterly and that the licensee stated that this is a “reasonable measurement frequency given storage strategy.” However, the guidance in

NUREG-1537, Part 1, Appendix 14.1, Section 4.3(6), states that “[i]f the reactor is not operated for long periods, the interval between conductivity ... measurements may be increased to monthly if reasonable justification is provided.” Provide a justification for specifying a periodicity greater than that recommended by NRC guidance or change the periodicity back to “once each month.”

10. The licensee proposed to revise TS 6.0 to read:

Reactor Safety Systems

Safety System Functions in table 1 will be performed as long as fuel is being stored

- 10.1. The NRC staff suggests replacing “will” with “shall” to make the proposed TS consistent with the guidance in NUREG-1537, Part 1.
- 10.2. The NRC staff suggests replacing “performed” with “operable” to make the proposed TS consistent with proposed TS 1.0, “Definitions.”
- 10.3. The NRC staff suggests capitalizing the word “table” to improve consistency.
- 10.4. The NRC staff notes that some of the safety system functions listed in Table 1 may not be consistent with the requirements in TS 7.0, “Radiation Monitoring.”
 - 10.4.1. For example, proposed TS 7.1 states, in part, “This monitor shall serve as both an area radiation monitor and a criticality alarm....”
 - 10.4.1.1. The NRC staff notes that a criticality alarm is not listed in Table 1. Make TS 7.1 and Table 1 consistent with respect to a criticality alarm, or justify why no change is needed.
 - 10.4.1.2. The NRC staff notes that it is not clear whether the annunciator and alarm set point for the area radiation monitor, as listed in Table 1, (i.e., ≤ 10 mr/hr), are the same value. Clarify the annunciator and alarm set points for the area radiation monitor in Table 1.
 - 10.4.2. For example, proposed TS 7.2 states, in part, “During fuel movement in reactor pool, a gas sample shall be continuously withdrawn....”
 - 10.4.2.1. The NRC staff notes that it is not clear whether this is referring to the Building Gas Effluent Monitor. Clarify the gas monitor used during fuel movement in TS 7.2 and Table 1.
 - 10.4.2.2. Table 1 requires the Building Gas Effluent Monitor to be operable at all times; however, if TS 7.2 is referring to the Building Gas Effluent Monitor, it appears to only be required during fuel movement. Resolve this apparent discrepancy.
 - 10.4.3. For example, proposed TS 7.3 states, in part, “A fission product water monitor....” The NRC staff notes that a fission product water monitor is not listed

in Table 1. Make TS 7.3 and Table 1 consistent with respect to a fission product water monitor, or justify why no change is needed.

10.4.4. Overall, the NRC staff notes that it is not clear which equipment/specifications listed in Table 1 apply to the equipment/specifications described in TS 7.0. Review Table 1 and TS 7.0 (i.e., TSs 7.1 through 7.7) and clearly identify which radiation monitoring equipment is required and provide the required specifications in both Table 1 and TS 7.0. Include the name of the equipment, the annunciation function (if applicable), the alarm function (if applicable), the corresponding setpoints, and the required operability conditions, or justify why no change is needed.

10.5. The NRC staff notes that the term “as long as fuel is being stored” in proposed TS 6.0 is not clear. Also, the LAR, as supplemented, does not appear to justify why the instrumentation (in TS Table 1) that would continue to be required by proposed TS 6.0 would be unnecessary when fuel is not being stored. The NRC staff suggests replacing this term with “while fuel is present at the facility.” For all of the NRC staff’s suggested changes, confirm that the changes are correct and appropriately reflect the status of the ARRR and that Aerotest agrees with the suggested changes, propose and justify alternate changes, or justify why no changes are needed. Additionally, justify why the instrumentation in TS Table 1 is not necessary when fuel is no longer present at the facility, or justify why no additional information is required.

10.6. The NRC staff notes that there is no provision for an out of service condition for the equipment listed in TS 6.0, and suggests that Aerotest consider an allowed out-of-service specification for TS 6.0 to facilitate the performance of repairs, replacement, periodic maintenance, calibration, etc.

11. The licensee proposed to revise TS 8.5 to read:

Thermal Column

Shall be authorized for reflector element storage only.

8.5.1 The thermal column shall be positioned remotely on steel locating pins immediately adjacent to the reactor core.

11.1. The NRC staff notes that the term “reactor core” may not be appropriate given the proposed POL status of the facility and that it is also not defined in the TS definitions. The NRC staff notes that the TS-defined term “core structure” may be more appropriate. Change TS 8.5 to more accurately reflect the proposed POL status of the facility, or justify why no change is needed.

11.2. The proposed TS 8.5 deletes the current TS 8.5.2. Add current TS 8.5.2 to proposed TS 8.5 or provide a justification for its deletion.

12. The licensee proposed to revise TS 11.3 to read:

A fuel handling tool shall be used in transferring fuel elements of low radioactivity between storage pits and the reactor; a shielded transfer cask shall be used for the transfer of highly radioactive fuel elements. The fuel handling tool shall

remain in a locked cabinet under the cognizance of the Fuel Handling Supervisor when not authorized for use.

- 12.1. The NRC staff notes that proposed TS 11.3 uses the term "Fuel Handling Supervisor," but that proposed TS 12.1.1 uses the term "Certified Fuel Handling Supervisor." For consistency, the NRC staff suggests using the term "Certified Fuel Handler Supervisor." Confirm that this change is correct and appropriately reflects the status of the ARRR and that Aerotest agrees with it, propose and justify an alternate change, or justify why no change is needed.
- 12.2. The NRC staff notes that the word "the" before the word "storage" in the first sentence was deleted from the current TS 11.3. Confirm that this deletion was intentional or restore this word to the proposed TS 11.3.

13. The licensee proposed to revise TS 11.4 to read:

Transfer of irradiated fuel in the reactor tank shall be conducted by a minimum of staff of two, a Certified Fuel Handler (CFH) and an additional person trained in radiation safety. The staff shall monitor the operation using the appropriate radiation monitoring instrument. A RSO or designee shall be present for irradiated fuel transfers outside of the reactor tank but within the facility. Under no circumstances is fuel to be transferred to or stored in the core lattice.

- 13.1. The NRC staff suggests adding "The" to the beginning of the first sentence, deleting "of" before "staff" in the first sentence, replacing the comma (,) after the word "two" with a semicolon (;), and replacing the "A" at the beginning of the third sentence with the word "The" to improve clarity. Make these changes or justify why no changes are needed.
- 13.2. The NRC staff notes that the proposed TS 11.4 limits fuel transfers to the reactor tank, and that this may unnecessarily limit fuel movement. Clarify if the licensee intends to limit all fuel transfers to the reactor tank, or revise the proposed TS accordingly.
- 13.3. The NRC staff notes that "appropriate radiation monitoring instrument" is not clear. Provide more specificity, such as identifying the equipment using the instruments provided in TS Table 1, or justify why no change is needed.
- 13.4. The NRC staff notes that the acronym "RSO" is not spelled out in the TSs or defined in the TS Definitions. Also, proposed TS 12.1.2 uses the term "Radiological Safety Officer" and proposed TS 12.1.5 uses the term "Radiation Safety Officer." Spell out the acronym in proposed TS 11.4 and use this term consistently throughout the TSs.

14. The licensee proposed to revise TS 11.5 to read:

No more than one fuel element shall be allowed in the facility which is not in storage. The only movement of the fuel elements are for required fuel element inspections, canister surveillances, rearrangement of fuel elements in storage, or final placement in the transportation cask.

- 14.1. To improve clarity, the NRC staff suggests that the first sentence be written as “No more than one fuel element that is not in storage shall be allowed in the facility” and that “are” be replaced with “shall be” in the second sentence. Make these changes, propose and justify alternate changes, or justify why no changes are needed.
 - 14.2. In the second sentence, consider defining the required fuel element inspections and canister surveillances, if Aerotest intends to have these in TSs. Otherwise, consider removing the word “required.” (See also RAI 29.4.)
15. The licensee proposed to revise TS 12.1.1 to read:
- The Certified Fuel Handler Supervisor shall have the responsibility of the reactor facility. In all matters pertaining to fuel handling operations and to these Technical Specifications, the Certified Fuel Handler Supervisor shall be responsible to the President, Aerotest Operations, Inc. The President, Aerotest Operations, Inc. shall report to the Board of Directors of Aerotest Operations, Inc.*
- 15.1. The NRC staff notes that the organizational structure of the ARRR facility is not clear. Provide a TS in Section 12 that provides the following information (consider using the guidance in NUREG-1537, Part 1, Appendix 14.1, Section 6.1, “Organization.” and ANSI/ANS-15.1-2007, Section 6.1, “Organization”):
 - 15.1.1. the organizational structure (i.e., Levels 1-4);
 - 15.1.2. individual responsibilities; and
 - 15.1.3. reporting and communication lines (e.g., ANSI/ANS-15.1-2007, Figure 1, “Organizational Chart”).
 - 15.1.4. Ensure that the CFH Supervisor and CFH positions are included and consistent with the descriptions provided in the ARRR CFHTRP.
 - 15.2. The NRC staff notes that the staffing requirements during the proposed POL period (i.e., conditions when a CFH or CFH Supervisor is required to be physically present at the facility) are not clear. It is also not clear whether any specific activities require a second CFH or other person to be at the facility. Provide this TS staffing requirement information in TS 12.
 - 15.3. The NRC staff is not clear as to what other roles the CFH or CFH Supervisor may have other than fuel handling, decommissioning, and emergency response. Describe any other required roles in TS 12.
 - 15.4. The NRC staff is not clear as to whether CFHs or CFH Supervisors are required after fuel is removed. Address this issue or justify why no changes are needed.
 - 15.5. The NRC staff notes that the word “the” was added between “have” and “responsibility” without explanation. Confirm that this change was intentional.
16. The licensee proposed to revise TS 12.1.3.2 to read:

Reviewing facilities procedures and significant modifications;

- 16.1. The NRC staff notes that “facilities” appears to be a typographical error. The NRC staff suggests replacing this with “ARRR facility.”
- 16.2. The proposed TS removes the word “all”. Explain this proposed change or consider restoring the word “all.”
- 16.3. The NRC staff notes that there is no explanation of what constitutes “significant modifications.” Provide a definition of “significant modifications,” or justify why no additional information is needed.

17. The licensee proposed to revise TS 12.1.3.3 to read:

Determining whether proposed procedures or modifications involve unreviewed safety questions, as defined in 10 CFR 50, Part 50.59(c) and are in accordance with these Technical Specifications.

The NRC staff notes that the proposed wording in TS 12.1.3.3 is not consistent with the regulations in 10 CFR 50.59, “Changes, tests, and experiments.” The NRC staff suggests rewording this TS to state: “Determining whether proposed changes to the facility or procedures are allowed without prior authorization by the NRC, as detailed in 10 CFR 50.59,” or provide other wording consistent with the regulations in 10 CFR 50.59.

18. The licensee proposed to revise TS 12.1.3.5 to read:

Reviewing all reported violations of these Technical Specifications, evaluating the causes of such events and the corrective action taken and recommending measures to prevent reoccurrence and;

The NRC staff notes that the words “abnormal occurrences and” were removed from this TS without any explanation or justification in the LAR. Indicate if this change was intentional and, if so, provide a basis and justification for the proposed change.

19. The licensee proposed to revise TS 12.1.3.6 to read:

Reporting their findings and recommendations concerning the above to the President, Aerotest Operations, Inc.

The NRC staff notes that the word “Inc” was added and that a closed quotation mark (”) was removed. Confirm that these changes were intentional.

20. The licensee proposed to revise TS 12.1.4 to read:

The CFH Supervisor shall have at least 5 years of experience in irradiated fuel movements and demonstrated knowledge of the relevant NRC regulations and ALARA principles. Classroom education in the nuclear and radiation related fields of study may be considered in lieu of the experience requirement.

The NRC staff notes that similar information was provided in the ARRR CFHTRP submitted by letter dated August 28, 2020 (ADAMS Accession No. ML20248H460). Ensure that any changes to TS 12.1.4 are reflected in the revised CFHTRP.

21. The licensee proposed to revise TS 12.1.5 to read:

The Radiation Safety Officer shall have a minimum of 2 years of experience in personnel and environmental radiation monitoring programs. Classroom education in the nuclear and radiation related fields of study may be considered in lieu of the experience requirement.

21.1. Whereas proposed TS 12.1.5 states "Radiation Safety Officer," proposed TS 11.4 states "RSO" and proposed TS 12.1.2 states "Radiological Safety Officer". Ensure consistency between these TSs.

21.2. The NRC staff notes that "at a nuclear facility" was removed without a description or justification. Provide the justification for this change.

21.3. The NRC staff notes that similar information was provided in the ARRR CFHTRP submitted by letter dated August 28, 2020. Ensure that any changes to TS 12.1.5 are reflected in the revised CFHTRP.

22. The licensee proposed to revise TS 12.2.1 to read:

Detailed written procedures shall be provided and followed for the following operations:

12.2.1.1 Fuel Handling operations;

12.2.1.2 Actions to be taken to correct specific and foreseen potential malfunctions of systems or components, including responses to alarms resulting from suspected primary system leaks;

12.2.1.3 Preventative or corrective maintenance operations which could have an effect on the safety of the facility.

22.1. The NRC staff notes that the current TS 12.2.1.1 was deleted without an explanation or justification; however, its reference to "systems and components involving nuclear safety of the facility" may still apply to the POL status. Provide a justification for the deletion of current TS 12.2.1.1, or restore the applicable requirements.

22.2. The NRC staff notes that proposed TS 12.2.1.2 now limits the scope of the required procedures to "alarms resulting from suspected primary system leaks." No explanation or justification was provided in the LAR for this change. Provide a justification for the proposed change.

23. The licensee proposed to revise TS 12.2.2 to read:

Temporary procedures which do not change the intent of previously approved procedures may be utilized on approval by the Reactor Administrator. Such procedures shall be subsequently reviewed by the Reactor Safeguards Committee.

- 23.1. The NRC staff suggests changing “Adminstrator” to “Administrator” to correct a misspelling. Correct or justify why no change is needed.
- 23.2. The NRC staff notes that the position of “Reactor Administrator” is not defined in the TSs. Provide a definition of Reactor Administrator.
24. The licensee proposed to revise TS 12.3 to read:

Records

Maintain records required under the facility license and applicable regulations.

Consistent with the guidance in NUREG-1537, Part 1, the staff suggests rewording this TS as “Records shall be maintained as required by the facility license and applicable regulations.” Make this change, propose and justify alternate changes, or justify why no changes are needed.

RAIs – Other TS Changes Noted by the NRC Staff

25. In proposed TS 3.1.1, TS 3.1.2, and TS 3.1.3, the NRC staff notes that first word of each TS has been capitalized (i.e., “All,” “Ventilation,” and “A”). Confirm that these changes were intentional.
26. In proposed TS 3.2, TS 7.1, and TS 8.4.3, the NRC staff notes that quotation marks have been removed. Confirm that these changes were intentional.
27. In proposed TS 9.0, the NRC staff notes that the title was changed from “Limitations” to “Limitation.” Confirm that this change was intentional.

RAIs – Other

28. The regulations in 10 CFR 20.1201, “Occupational dose limits for adults,” and 10 CFR 20.1301, “Dose limits for individual members of the public,” provide radiation dose limits for radiation workers and members of the public, respectively. The regulations in 10 CFR 50.34, “Contents of applications; technical information,” paragraph (b)(3) require licensees to provide information regarding the kinds and quantities of radioactive materials produced in reactor operation and the means for controlling effluents and exposures from those materials. The regulations in 10 CFR 50.51(b)(1) require that for facilities that have permanently ceased operation, licensees shall continue to maintain the facility, including, where applicable, the storage, control, and maintenance of the spent fuel, in a safe condition. The regulations in 10 CFR 50.9 require that information submitted to the NRC be complete and accurate in all material respects.

In its LAR, as supplemented, including its response (and clarification to its response) to RAI No. 3 and RAI No. 12 submitted by letters dated March 26 and June 8, 2020, the licensee discusses fuel storage in the ARRR pool, including the canisters it uses to encapsulate damaged fuel elements. However, certain information regarding the licensee’s fuel storage and damaged fuel, and how any dose or effluent from the pool will be ensured to remain within regulatory limits during extended fuel storage, remains unclear to the NRC staff. Provide the following or justify why no additional information is required.

- 28.1. In its response (and subsequent clarification of its response) to RAI No. 3 in its letters dated March 26 and June 8, 2020, the licensee stated that its fuel is stored at the bottom of the core tank, either in floor storage racks or in a wall-mounted storage rack. In an earlier letter dated August 15, 2013 (ADAMS Accession No. ML13247A668), the licensee stated that it has 12 unused (new) stainless-steel-clad elements in storage. Clarify whether the fuel storage information in the response (and subsequent clarification of the response) to RAI No. 3 applies only to irradiated fuel, or justify why no additional information is required.
- 28.2. In its letter dated August 15, 2013, the licensee described two additional damaged aluminum-clad elements (with cracks in the cladding) beyond the 22 canistered elements. The August 15, 2013, letter stated that Aerotest had two additional canisters available, but that it did not plan to canister the two elements at that time, because it wanted to observe the elements over the next year to monitor the cracks. The NRC Inspection Report No. 50-228/2014-201, dated December 19, 2014, described three additional damaged fuel elements that had not been canistered, for a total of 25 damaged elements. In its RAI response letter dated June 8, 2020, the licensee stated that 22 of its fuel elements are damaged enough that the integrity of the cladding has been compromised, and those elements have subsequently been encapsulated in purpose-built damaged fuel canisters (designed to provide a cladding of the fuel that has cracked), but the LAR, as supplemented, does not appear to discuss any uncanistered damaged elements.
- 28.2.1. Confirm the number of damaged aluminum-clad elements that have not been placed in canisters, and the nature of the damage (e.g., cracked cladding).
- 28.2.2. Confirm whether Aerotest has any damaged stainless-steel-clad elements and, if so, describe the number of elements and the nature of the damage.
- 28.2.3. Confirm whether Aerotest plans to continue to keep any uncanistered damaged elements uncanistered and, if so, describe why it is acceptable for these elements to continue to be stored uncanistered.
- 28.3. In its RAI response letter dated June 8, 2020, the licensee stated that “[t]he surveillance data for the canisters during the last 6 years have shown no signs of loss of the helium gas.” The licensee also stated that “[a]n initial surveillance to detect change in weight of the canister system was done to validate the effectiveness of the canister’s seal design. (It has been confirmed and the surveillance is no longer needed.)”

The NRC staff notes that the fuel elements were placed in canisters and the canisters were sealed in 2012.

Describe how Aerotest verifies that canisters are not leaking helium gas and confirm whether they have shown no sign of leakage since being sealed or only for the past 6 years. If there was earlier leakage, discuss how this was addressed.

- 28.4. In its RAI response letter dated June 8, 2020, the licensee stated that “[e]ach canned element will be inspected within a 5-year period as suggested in NUREG 1537 guidance. The canister shell will be subject to similar cladding integrity evaluations as required for fuel elements.” The licensee also stated that “[t]he need to provide

surveillance should be expressed in the technical specifications....” Additionally, proposed TS 11.5 appears to reference required fuel element inspections and canister surveillance (see also RAI 14). However, the proposed TSs in the LAR, as supplemented, do not appear to include any requirements related to fuel or canister inspections.

Clarify whether Aerotest inspects both fuel elements (uncanistered) and fuel element canisters with a 5-year period. Additionally, clarify whether Aerotest intends to add requirements for these inspections to the TSs and, if so, provide proposed TSs.

- 28.5. In its RAI response letter dated June 8, 2020, the licensee stated that it periodically extracts water from the reactor tank and evaluates it for the presence of radioisotopes, including, specifically, the fission product cesium. However, the frequency and acceptance criteria for this surveillance, the historical results from such surveillances, and the actions that the licensee may take in the event of elevated fission product levels detected during surveillances, are not clear. The NRC staff also notes that it may be appropriate for this measurement to have associated TSs to help verify continued safe long-term storage of the fuel, given that the proposed POL would continue to authorize possession of fuel. Aerotest also stated that, historically, TRIGA fuel elements have been stored in the ARRR pool and that the elements possessed no indication of continued fission product release, but it is not clear if this statement extends to the current fuel storage at the ARRR.
- 28.5.1. Describe and justify the frequency for reactor tank water radioactivity measurements and describe whether these are intended to be bulk (i.e., averaged over the entire pool volume) measurements.
- 28.5.2. Discuss any trending of tank water radioactivity measurements that Aerotest performs to evaluate for any possibility of fission product leakage to the tank.
- 28.5.3. Clarify whether Aerotest has detected fission products (e.g., cesium or strontium) in the tank water in the past (since the reactor has been shutdown, from either water sampling or other means, such as demineralizer analysis) and, if so, describe the concentrations and trends observed.
- 28.5.4. Propose and justify appropriate TSs limiting tank water radioactivity and requiring periodic surveillance of tank water radioactivity, or justify why such TSs are not necessary.
- 28.5.5. Describe actions that Aerotest would take or procedures that it would follow (if any) if it were to detect elevated reactor tank water radioactivity.
- 28.6. In its response to RAI clarification request 12.3.2 in its RAI response letter dated June 8, 2020, the licensee discussed how leaking elements may be located in an operating reactor, but it is still not clear what actions Aerotest would take if it determined that a canister was leaking. Describe actions that Aerotest would take or procedures it would follow (if any) if it were to determine that canisters were leaking or damaged.
- 28.7. In Sections 4.3.1 and 4.3.2 of its updated safety analysis report submitted by letter dated December 20, 2017 (ADAMS Accession No. ML18045A571) in support of its

license renewal application (since withdrawn), Aerotest stated that the reactor tank is set in concrete, which adds greatly to the mechanical integrity and that the rupture of the tank is very unlikely due to the use of reinforced concrete. However, it is not clear whether there have been any known leaks from the tank or if Aerotest does any surveillance or trending that would help identify any possible tank leakage.

Discuss whether there have been any known historical or are any current leaks from the ARRR tank. Additionally, describe any surveillance or data trending (e.g., monitoring significant changes in makeup water needs) that Aerotest performs that could help identify any potential pool leakage.

29. The regulations in 10 CFR 50.82(b)(6)(i) state that the NRC will terminate a non-power reactor license if, in part, it determines that the decommissioning of the facility has been performed in accordance with the approved DP.

The guidance in NUREG-1537, Part 1, Section 17.2.1 states that possession-only LARs should discuss the activities to be accomplished and their schedule while the POL is in effect.

In its LAR, as supplemented, Aerotest stated that it plans to amend the ARRR license to a POL in preparation for decommissioning. However, it is not clear to the NRC staff what types of activities Aerotest may plan to conduct following the issuance of a POL, but prior to the NRC approval of an ARRR DP. Additionally, it is not clear how Aerotest plans to control activities before DP approval to make sure that no activities are conducted ahead of DP approval that should only be conducted in accordance with an approved DP.

- 29.1. Describe the types of activities that are decommissioning-related or that are done to prepare for decommissioning (e.g., facility characterization activities) that Aerotest may plan to conduct prior to NRC approval of a DP.
- 29.2. Describe how Aerotest will control activities before DP approval to make sure that only appropriate activities are conducted. Describe ARRR staff responsibility for controlling activities, including who will have the primary responsibility for this (e.g., the CFH Supervisor or Reactor Supervisor; see also RAI 15).