



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

February 13, 2020

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: AMENDMENT REQUEST FOR POSSESSION-ONLY  
LICENSE 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 (ADAMS) Accession No. ML19084A051), as supplemented by letters dated June 28, and August 14, 2019 (ADAMS Accession Nos. ML19184A112 and ML19231A127, respectively), Aerotest Operations, Inc. applied for an amendment to Facility Operating License No. R-98 for the Aerotest Radiography and Research Reactor (ARRR). The requested amendment would modify Facility Operating License No. R-98 to a possession-only license in support of your 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 license amendment, as described in the enclosed request for additional information (RAI). As discussed during the site audit on December 11, 2019, the NRC staff requests a response to the enclosed RAI or a written request for additional time to respond, including the proposed response date and a brief explanation of the reason, by 60 days from the date of this request. Following receipt of the complete response to the RAI, the NRC staff will continue its review of the possession-only license amendment.

The responses 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," and 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."

Based on the response date provided above, the NRC staff expects to complete its review and make a final determination on the possession-only license amendment by July 8, 2021, as previously provided by NRC staff letter dated July 30, 2019 (ADAMS Accession No. ML19193A077). This date could change due to several factors including a need for further RAIs, unanticipated changes to the scope of the review, unsolicited supplements to the application for amendment, and others. If the forecasted date changes, the NRC staff will notify you in writing of the new date and an explanation of the reason for the change. In the case that

the NRC staff requires additional information beyond that provided in the response to this RAI, the NRC staff will request that information by separate correspondence.

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](mailto:Geoffrey.Wertz@nrc.gov).

Sincerely,

**/RA/**

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: See next page

Aerotest Operations, Inc.

Docket No. 50-228

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: AMENDMENT REQUEST FOR POSSESSION-ONLY  
LICENSE FOR THE AEROTEST RADIOGRAPHY AND RESEARCH REACTOR  
FACILITY OPERATING LICENSE NO. R-98 (EPID NO. L-2019-LLA-0065)  
DATE: FEBRUARY 13, 2020

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ADAMS Accession No. : ML20034G445

\*concurred via email

NRR-088

OFFICE	NRR/DANU/UNPL/PM	NRR/DANU/UNPL/LA*	NRR/DANU/UNPO/BC	NRR/DANU/UNPL/BC
NAME	GWertz	NParker	TTate	GCasto
DATE	2/5/2020	2/5/2020	2/7/2020	2/13/2020

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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) staff is continuing its review of your license amendment request (LAR) to modify Facility Operating License No. R-98, and its supporting technical specifications (TSs) to a possession-only license in support of your decision to permanently cease operation of the Aerotest Radiography and Research Reactor (ARRR), as provided by letter dated March 21, 2019, as supplemented by letters dated June 28, and August 14, 2019 (available on the NRC's public web site at [www.nrc.gov](http://www.nrc.gov) under the Agencywide Documents Access and Management System (ADAMS) Accession Nos.: ML19084A051, ML19184A112, and ML19231A127, respectively). The NRC staff's review has identified that the items listed in this enclosure need additional information or clarification. We request that you provide responses within 60 days from the date of this request.

These requests for additional information have been developed based on the following requirements and guidance applicable to your LAR:

- The regulations in Title 10 of the *Code of Federal Regulations* (10 CFR).
- The regulations in 10 CFR 50.9, "Completeness and accuracy of information," require that information provided to the Commission by a licensee shall be complete and accurate in all material respects.
- The regulations in 10 CFR 2.390, "Public inspections, exemptions, requests for withholding," which provide regulations for withholding information from the public.
- The regulations in 10 CFR 50.54, "Conditions of licenses," which provide regulations for Emergency Plans.
- The regulations in 10 CFR 50.59, "Changes, tests and experiments," which only apply to operating reactors.
- The regulations in 10 CFR 50.82, "Termination of License," which provide regulations for license termination.
- NUREG-1537 Part 1, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors, Format and Content," issued February 1996 (ADAMS Accession No. ML042430055).

Enclosure

- NUREG-1537 Part 2, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors, Standard Review Plan and Acceptance Criteria," issued February 1996 (ADAMS Accession No. ML042430048).
- Regulatory Guide (RG) 5.59, "Standard Format and Content for a Licensee Physical Security Plan for the Protection of Special Nuclear Material of Moderate or Low Strategic Significance."
- ARRR Aerojet-General Nucleonics Industrial Reactor Hazards Summary Report, September 1964 (ADAMS Accession No. ML19192A162).

Based on its review, the NRC staff requires the following additional information to continue its review of the LAR.

1. The regulations in 10 CFR 50.9, require all submissions to be complete and accurate in all material respects. Further, the guidance in NUREG-1537, Part 1, Section 17.2.1, "An Application for a Possession-Only License Amendment," states, in part, "[t]he licensee should commit to a date to submit the applications for authorization to decommission and for license termination." Further, as stated in the NRC staff letter dated July 30, 2019 (ADAMS Accession No. ML19193A077), the licensee is required to submit an application for license termination, which must be accompanied or preceded by a proposed decommissioning plan, with contents specified in 10 CFR 50.82(b)(4), within 2 years from declaring permanent cessation of operations, which ends December 5, 2020.

The NRC staff did not find a commitment date to submit the application for license termination and decommissioning plan in your LAR.

Provide a commitment date, or time period, to submit the application for license termination and decommissioning plan, or justify why this information is not needed.

2. The regulations in 10 CFR 50.9, require all submissions to be complete and accurate in all material respects. Further, the guidance in NUREG-1537, Part 1, Section 17.2.1.1, "Facility License," states that the proposed changes should be consistent with the possession-only status.

- 2.1 By letter dated June 28, 2019, Enclosure 2, the licensee proposed a change to License Condition (LC) 2.B.(2) to remove "receive," and "and use." The NRC staff review finds that the LAR did not request to remove the phrase "in connection with the operation of the reactor." The NRC staff is not clear why this phrase is needed for a possession-only license.

Remove the phrase, "in connection with the operation of the reactor," or justify why no change is needed.

- 2.2 By letter dated June 28, 2019, Enclosure 2, the licensee proposed a change to LC 2.B.(3) to remove "receive," and "and use." The NRC staff review finds that the LAR did not request to remove or modify the phrase "as may be produced by operation of the reactor." Since the reactor can no longer produce byproduct material, the NRC staff does not understand why this phrase should remain.

Remove or modify the phrase "as may be produced by operation of the reactor," or justify why no change is needed.

- 2.3 By letter dated June 28, 2019, Enclosure 2, the licensee provided LC 2.C.(3), which references 10 CFR 2.790. The NRC staff finds reference to 10 CFR 2.790 to be outdated and current regulation is provided by 10 CFR 2.390, "Public inspections, exemptions, requests for withholding." The NRC staff requests the licensee revise LC 2.C.(3) to use the current regulation of 10 CFR 2.390.

Revise LC 2.C.(3) to use 10 CFR 2.390, or justify why no change is needed.

3. The regulations in 10 CFR 50.9, require all submissions to be complete and accurate in all material respects. Further, the guidance in NUREG-1537, Part 1, Section 17.2.1, provides guidance that, "In the safety analysis, the licensee should describe and analyze the shutdown facility and the provisions to control reactor-related radioactivity to protect the health and safety of the public." NUREG-1537, Part 1, Section 17.2.1.2, "Technical Specifications," provides guidance that, "...the proposed technical specifications should be based on conditions analyzed in the possession-only safety analysis." Further, NUREG-1537, Part 1, Section 17.2.1.4, "Possession-Only License Amendment Safety Analysis," provides guidance that the purpose of a possession-only license amendment safety analysis is to show that the facility can be possessed in a way that protects the health and safety of workers, the public and the environment.

By letter dated June 28, 2019, Enclosure 1 states, "There is no conflict with the new direction and authority concerning the existing SAR [Safety Analysis Report] (Aerojet-General Nucleonics Industrial Reactor - Hazards Summary report, AN-1193, September 1964); thus, changes are not needed or proposed." However, the NRC staff is not clear as to the applicability of the referenced Aerotest SAR to provide a basis for the proposed TSs, and to provide analyses that demonstrate that the facility can be possessed in a way that protects the health and safety of workers, the public and the environment. More specifically, the NRC staff requests the following information which was not found in the SAR:

- 3.1 Provide a description of the proposed fuel storage location, and any proposed limits on its movement.
- 3.2 Provide a description of the conditions necessary to maintain the fuel in a safe condition.
- 3.3 Provide the results of safety reviews performed to ensure that the possession-only fuel remains in a safe condition.
- 3.4 Provide a description of any accident scenarios associated with the possession-only fuel in long term storage.

Provide the specific information requested above, or justify why no additional information is needed.

4. The regulations in 10 CFR 50.9, require all submissions to be complete and accurate in all material respects. Further, the guidance in NUREG-1537, Part 1, Section 17.2.1.3, "Emergency, Physical Security, and Operator Requalification Plans," provides guidance that the emergency plan and physical security plan, and the operator requalification program, "should be modified to reflect the facility status and ensure that the health and safety of the public continue to be protected." Furthermore, RG 5.59, provides guidance on the information needed in the physical security plan.

The understanding of the NRC staff is that the fuel will remain on site, thereby requiring the use of both the emergency and security plans. By letter dated June 28, 2019, Enclosure 1 indicates that, "[t]o ensure consistency with the fuel possession-only using CFHs [certified fuel handlers], Aerotest Operations Security Plan, Emergency Plan, and Facility Operating Procedures have been updated to reflect the new status and authority." The NRC staff found, during its audit review conducted on December 11, 2019, at the ARRR facility, that both the emergency and the security plans still needed to be updated to reflect the possession-only status. From the regulatory audit, the NRC staff understands that Aerotest plans to implement changes to the emergency plan in accordance with the regulations in 10 CFR 50.54, "Conditions of licenses," Section (q), "Emergency Plans," and an updated version of the security plan will be submitted by Aerotest for review and approval as part of this LAR.

Provide the possession-only versions of the Aerotest Operations Security Plan and Emergency Plan, or justify why no additional information is needed.

5. The regulations in 10 CFR 50.9, require all submissions to be complete and accurate in all material respects. NUREG-1537, Part 1, Section 17.2.1.5, "Changes to Facility Without License Amendment," provides guidance that a licensee should propose a method for making operational or procedural changes under a possession-only license because the regulations in 10 CFR 50.59, "Changes, tests and experiments," apply only to an operating reactor license. Further, NUREG-1537, Part 1, Section 9, "Changes to the Decommissioning Plan," of Appendix 17.1, "Format and Content of Decommissioning Plan for Non-Power Reactors," provides an example of a method for making operational or procedural changes.

- 5.1 The NRC staff did not find a plan for making operational or procedural changes in the LAR.

Provide a plan or method for making operational or procedural changes under the possession-only license, or justify why no additional information is needed.

- 5.2 By letter dated June 28, 2019, the licensee proposed TS 12.1.3.3, which states, in part, "as defined in 10 CFR 50, Part 50.59(c)." The NRC staff review finds that the regulations in 10 CFR 50.59 applies only to operating reactors. Additionally, the term "unreviewed safety questions" is no longer used in 10 CFR 50.59.

Revise or eliminate TS 12.1.3.3, to be consistent with the licensee's development of a facility change plan as described in RAI 5.1 above, or justify why no change is needed.

6. The regulations in 10 CFR 50.9, require all submissions to be complete and accurate in all material respects. Further, NUREG-1537, Part 1, Section 9.2, "Handling and Storage of Reactor Fuel," provides guidance that the licensee should provide analyses and discuss how subcriticality is ensured (i.e., keff not to exceed 0.90) under all conditions.

The NRC staff reviewed the LAR, including the ARRR Aerojet-General Nucleonics Industrial Reactor Hazards Summary Report, September 1964, and could not find a reference to an analysis or discussion on how the subcriticality of the fuel is ensured.

Provide an analysis or discussion that demonstrates the fuel storage is ensured with a keff of 0.8 or less, or justify why no additional information is needed.



7. The regulations in 10 CFR 50.9, require all submissions to be complete and accurate in all material respects. Further, NUREG-1537, Part 1, Chapter 14, "Technical Specifications," provides guidance for the content of the proposed TSs, and states that the NRC staff will review the proposed TSs to ensure that they are complete and comprehensive.

By letter dated June 28, Enclosure 2, the licensee proposed TS 6.0, "Reactor Safety System," which stated, "Reactor operations sequences, interlock and safety systems need not be operable since no fuel and/or reflector elements shall be allowed in the core lattice." However, by the same letter, the licensee proposed TS Table 1, "Safety System Functions," which provides safety system trip devices, sensors, annunciation and alarm set point. The NRC staff does not understand description in proposed TS 6.0, which indicates no safety system functions, versus the proposed Table 1, which appears to contain safety system functions.

Clarify proposed TSs 6.0 and/or TS Table 1, for description consistency, or justify why no change is needed.

8. The regulations in 10 CFR 50.9, require all submissions to be complete and accurate in all material respects. Further, NUREG-1537, Part 1, Chapter 14, provides guidance for the content of the proposed TSs, and states that the NRC staff will review the proposed TSs to ensure that they are complete and comprehensive.

By letter dated June 28, 2019, Enclosure 2, the licensee proposed TS 12.1.2, which states, in part, "all procedures and experiments involving radiological safety." The NRC staff is not clear what experiments would be conducted during the possession-only license status given that the reactor fuel has been removed from the reactor.

Clarify proposed TS 12.1.2 to explain the need for experiments or justify why no change is needed.

9. The regulations in 10 CFR 50.9, require all submissions to be complete and accurate in all material respects. Further, NUREG-1537, Part 1, Chapter 14, provides guidance for the content of the proposed TSs, and states that the NRC staff will review the proposed TSs to ensure that they are complete and comprehensive.

By letter dated June 28, 2019, Enclosure 2, the licensee proposed TS 12.1.3.5, which states, in part, "abnormal occurrences." The NRC staff could not find a description of what constitutes abnormal occurrences.

Provide a description of abnormal occurrences, or justify why no additional information is needed.

10. The regulations in 10 CFR 50.9, require that all submissions shall be complete and accurate in all material respects. Further, NUREG-1537, Part 1, Chapter 14, provides guidance for the content of the proposed TSs, and states that the NRC staff will review the proposed TSs to ensure that they are complete and comprehensive.

By letter dated June 28, 2019, Enclosure 2, the licensee proposed TS 12.2.2, which states, in part, "qualified individual." The NRC staff could not find a description of what constitutes a qualified individual.

Provide a description of a qualified individual, or justify why no additional information is needed.

11. The regulations in 10 CFR 50.9, require that all submissions shall be complete and accurate in all material respects. Further, NUREG-1537, Part 1, Chapter 14, provides guidance for the format of the proposed TSs, and states that the NRC staff will review the proposed TSs to ensure that they are complete and comprehensive. By letter dated August 14, 2019, the licensee provided a "clean" copy of the proposed TSs which were marked up in Enclosure 2, to letter dated June 28, 2019. The NRC staff review of the proposed TSs in the licensee's letter dated August 14, 2019, finds the following items which need to be addressed:

- 11.1 The numbering throughout the proposed TSs appear to be missing decimal points. Additionally, sentences appear to be missing punctuation, (i.e., periods and commas). The NRC staff finds the number format not to be consistent with the guidance in NUREG-1537.
- 11.2 Proposed TS 7.3 states, "The range of the monitor shall be from 0 1 to 100 mr/hr." The NRC staff questions if a decimal point is missing (i.e., should it be 0.1).
- 11.3 Proposed TS 7.4 states, "Portable survey instruments for measuring beta-gamma dose rates from 0 1 mr/hr to 50 r/hr shall be available at the facility." The NRC staff questions if a decimal point is missing (i.e., should be 0.1).
- 11.4 Proposed TS 7.5 states, "Portable instruments for measuring fast and thermal neutron dose rates from 0 1 mrem/hr to 1 0 rem/hr shall be available at the facility." The NRC staff questions if decimal points are missing (i.e., 0.1 and 1.0, respectively).
- 11.5 Proposed TS 11.2 states, "Additional fuel storage racks maybe located in the reactor tank. Each of these storage facilities shall be designed that for all conditions of moderation keff shall not exceed a value of 0 8." The NRC staff questions if a period is needed after "tank," and if a decimal point is needed (i.e., 0.8).

Provide an update to the TSs provided by letter dated August 14, 2019, which address the issues identified above, and any related issues not identified by the NRC staff, or state why no changes are needed.

12. The regulations in 10 CFR 50.9, require that all submissions shall be complete and accurate in all material respects. Further, NUREG-1537, Part 1, Chapter 17, "Decommissioning and Possession-Only License Amendments," Section 17.2.1.2, provides guidance that the TSs should contain a surveillance section that includes surveillance provisions for each limitation on possession. The NRC staff noted during its audit review (ADAMS Accession No. ML20017A278), that some ARRR fuel elements were being stored in canisters due to cladding damage. To ensure the development of proper surveillances for storage of the fuel, the NRC staff needs the following information:

- 12.1 Provide a description of the canisters.
- 12.2 Provide any information available on the design of the canisters, including the composition materials, the expected design lifetime of the canisters in the current and any future storage environment. Indicated if replacement of the canisters is needed due to age or material condition degradation.

- 12.3 Provide any surveillance requirements needed to ensure the integrity of the canisters to properly encapsulate the fuel element.

Provide the information requested or justify why no additional information is needed.