National Aeronautics and
Space Administration
John H. Glenn Research Center
Lewis Field
Plum Brook Station
Sandusky, OH 44870

JAN 24 2002

Reply to Attn of: 0500

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Subject: Request for Amendment to License R-93, Docket No. 50-185
(Technical Specifications and License Conditions)

The following request is affirmed under 28 USC Section 1746. As stated in Section Five of the Decommissioning Plan for the Plum Brook Reactor Facility, a separate licensing action would be submitted independent of that plan, which would establish decommissioning Technical Specifications. In accordance with the applicable sections of 10 CFR Part 50, the National Aeronautics and Space Administration (NASA) submits these Technical Specifications and a new license condition in order to support anticipated decommissioning activities under License R-93 for the Plum Brook Mock-up Reactor (MUR). A similar request is being made concurrently for the Plum Brook Research Reactor under separate Amendment to License TR-3, Docket No. 50-30.

Specifically, NASA requests to: 1) Replace existing Technical Specifications (Appendix A of the license) with revised Technical Specifications more appropriate for decommissioning; and 2) Add a license condition to receive, possess, and use byproduct and source materials in anticipation of NRC's pending approval to commence decommissioning. Approval of this request would facilitate a more effective implementation of decommissioning activities.

The following four enclosures support the proposed License Amendment (Technical Specifications) and License Condition:

1. Decommissioning Technical Specifications (Appendix A of License R-93, Docket No. 50-185).

2. General Information Amendment to License R-93, Docket No. 50-185.

3. Proposed Amendment and License Condition to "Possess-Do-Not-Operate" License R-93, Docket No. 50-185.

A020

4. Significant Hazards Consideration Analysis and Environmental Evaluation of Proposed Amendment to License R-93, Docket No. 50-185.

Should you have any questions or need additional information, please contact Mr. Timothy Polich, NASA Plum Brook Station, 6100 Columbus Avenue, Sandusky, OH 44870, at (419) 621-3314.

The enclosed License Amendment and License Condition Request are true and correct to the best of my knowledge and belief. I declare under penalty of perjury that the foregoing is true and correct. Executed on the 23rd day of January, ~~2001~~ 2002.

Donald J. Campbell
Director

Docket No. 50-185

4 Enclosures

cc:
ODHB/E. Denison
NRC/M. Mendonca
J. Dyer

ENCLOSURE TO LICENSE AMENDMENT NO. 8
FACILITY LICENSE NO. R-93
DOCKET NO. 50-185

Replace the entirety of Appendix A, license R-93, Docket No. 50-185 with the enclosed pages. No change bars were used since this amendment represents a substantial change to the entire body of Technical Specifications.

APPENDIX A

TECHNICAL SPECIFICATIONS

FOR THE

LICENSE NO. R-93

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

PLUM BROOK STATION

SANDUSKY, OHIO

DOCKET NO. 50-185

NOVEMBER 2001

TECHNICAL SPECIFICATIONS

1.0 INTRODUCTION

1.1 Scope

These Technical Specifications apply to all activities conducted at the Plum Brook Reactor Facility (PBRF) - specifically to the Plum Brook Research Reactor (PBRR) under provisions of NRC license No. TR-3 and to the Mock-up Reactor (MUR) under NRC license No. R-93. Both the PBRR and MUR were shut down in 1973, all fuel was removed, and they have been maintained in a "possess-do-not-operate" safe storage condition since that time. Both of these reactors and their associated systems are located in the same controlled area at the PBRF on Plum Brook Station, and both will be undergoing decommissioning at the same time. Therefore, these Technical Specifications address both licensed facilities.

1.2 Application

These Technical Specifications shall apply during Plum Brook Reactor Facility decommissioning activities. After completion of the decommissioning activities, NASA shall formally request the termination of the facility operating licenses through the NRC license termination process. Specific procedures or actions to meet the requirements of these technical specifications are not a part of these technical specifications.

2.0 DEFINITIONS

2.1 General

Authorized Entry. Entry to the PBRF which is sanctioned by the PBRF physical security plan, for those persons having a legitimate need to enter and who have knowledge of the conditions, hazards, and procedures at the facility, or who are accompanied by an authorized person with this knowledge.

Clean. The condition of an area wherein contamination levels do not exceed the limits as stated in Table 2 below:

Table 2: Acceptable Surface Contamination Levels

Nuclide[a]	Average[b c]	Maximum[b d]	Removable[b e]
U-Nat, U-235, U-238, and associated decay products	5,000 dpm α /100cm^2	15,000 dpm α /100cm^2	1000 dpm α /100cm^2
Transuranics, Ra-226, Ra-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100cm^2	300 dpm/100cm^2	20 dpm/100cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1000 dpm/100cm^2	3000 dpm/100cm^2	200 dpm/100cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5,000 dpm β/γ 100cm^2	15,000 dpm β/γ 100cm^2	1,000 dpm β/γ 100cm^2

[a] Where surface contamination by both alpha-, and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

[b] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[c] Measurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

[d] The maximum contamination level applies to an area of not more than 100 cm^2.

[e] The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

Containment. A closure on the overall facility or a volume within the facility, which prevents the uncontrolled spread of contamination and controls the movement of air (inward and outward) through a controlled path.

Containment Device. A Containment Device is an engineered barrier that does not necessarily constitute total enclosure, and is used to prevent the spread of radioactive contamination and airborne radioactivity.

Decommissioning. Decommissioning means to remove a facility or site safely from service and reduce residual radioactivity to a level that permits: (1) release of the property for unrestricted use and termination of the license; or (2) release of the property under restricted conditions and termination of the license.

Decommissioning Activities. Decommissioning activities means all administrative and industrial efforts employed in order to achieve decommissioning. Some examples of such activities include decontamination, demolition, deconstruction, radiological surveys, and the shipping and receiving of radioactive materials, apparatus and equipment.

Kept Dry. The condition of an area, which is normally dry, or drained and mopped dry as soon as practical after becoming inadvertently wet.

Non-operable. The condition of a component or system, which has been intentionally disabled to prevent it from performing its intended function.

Protected Safe Storage. The custodial state of undefined duration, characterized by physical and procedural access control and periodic monitoring, maintenance and inspection.

Radioactive Materials.

> **Radioactive Material** – Items, which spontaneously decay and emit energetic particles or gamma energy. These items may be naturally occurring, may have been activated as a result of previous exposure to a neutron flux from reactor operations, or may have become radioactively contaminated.
>
> **Contaminated Material** – Activated, or non-activated items containing undesirable particles of radioactive materials on their surfaces, either embedded or easily removable.

Shall, should and may. "Shall" is used to denote a requirement; "should" to denote a recommendation; and "may" to denote permission, neither a requirement nor a recommendation.

Surveillance Frequency. Unless otherwise stated in these specifications, periodic surveillance tests, checks, calibrations, and examinations shall be performed within the specified surveillance intervals. In cases where the elapsed interval has exceeded 100% of the specified interval, the next surveillance interval shall commence at the end of the original specified interval. Allowable surveillance interval, as defined in ANSI/ANS 15.1 (1990) shall not exceed the following:

1. Annual (interval not to exceed 15 months).
2. Semiannual (interval not to exceed seven and one-half months).
3. Quarterly (interval not to exceed four months).
4. Monthly (interval not to exceed six weeks).

2.2 Facility Specific Definitions

Containment Vessel. The Containment Vessel is the structure that provides containment for the main reactor plant components including the Reactor Tank.

Source Term. The magnitude and mix of radionuclides present in PBRF systems, structures and components, which are the result of PBRF reactor operations. The major portions of the source term are comprised of the Reactor Tank and internals, associated reactor piping and system components, and activated materials stored in the PBRF Hot Laboratory facilities.

Unrestricted Area. An Unrestricted Area is an area to which access is neither limited nor controlled by the licensee for purposes of the protection of individuals from exposure to radiation and radioactive materials.

3.0 LIMITING CONDITIONS FOR OPERATION

3.1 Control of Access

Applicability

This specification shall apply to all personnel and vehicular access to PBRF, under the following conditions:

(1) While the source term remains on the PBRF site.

(2) While protection of capital assets is required.

(3) When protection of personnel from radiological or industrial hazards exposure is required.

Objective

The objective of this specification is to define the controls required for safe, monitored access and egress of personnel, vehicles and materials at PBRF.

Specification

(1) Common industrial security measures shall be provided at the access of the PBRF fenced area in order to control personnel exposure to radiation and industrial hazards, and to protect capital assets. Written procedures will be utilized in order to achieve these controls. There is no requirement to safeguard special nuclear material since all nuclear fuel has been removed from PBRF and shipped off site.

(2) Personnel shall receive radiological monitoring prior to entry into, and prior to egress from the PBRF site.

Limiting Conditions for Controlling Access

(1) Whenever decommissioning activities are in progress, properly trained personnel shall be stationed in such a manner so as to effectively control personnel, vehicle and material entry into, and egress out of the fenced area making up the PBRF site. Only personnel who have legitimate decommissioning business shall be admitted.

(2) NASA Plum Brook security badges are required prior to gaining access to the interior of the PBRF fenced area, or any buildings and worksites contained therein.

(3) Access to radiologically controlled areas shall be controlled in accordance with 10 CFR 20 requirements. Visitors and non-radiological workers shall be properly escorted whenever such entry within the fenced area is warranted.

(4) An effective method of continuously accounting for the presence of all personnel within the fenced PBRF site shall be utilized.

(5) During non-working hours, and at all other times when no decommissioning activity is in progress, the PBRF fenced perimeter shall be locked and secured. Access to keys for the PBRF fence gates is limited to personnel authorized by the NASA Decommissioning Project Manager. Key controls for the PBRF site will be governed by a written procedure, and the list of authorized personnel with access to PBRF keys shall be periodically audited.

Action to be Taken if Access Controls are not Maintained

If access controls are not maintained in accordance with this Specification:

(1) As soon as safe and practicable, all personnel, vehicles and material who may have entered the fenced PBRF site without proper monitoring, as well as all personnel, vehicles and material that may not have been properly monitored prior to egress shall be accounted for.

(2) If key control is lost, perimeter fence locks shall be changed-out and security re-established as soon as practicable.

Bases

The restrictions and limitations of Specification 5.3.1 are necessary to provide assurance that effective PBRF site security and control of personnel exposure to radiological and industrial hazards is maintained. Additionally, the monitored egress of personnel from the site is necessary to assure that no uncontrolled radiological or industrial hazards inadvertently leave PBRF.

3.2 Alarm Response

Applicability

This specification applies to the automatic alarms associated with the PBRF under the following conditions:

(1) When CV "Door Open" monitoring is needed to maintain containment when major portions of the source term are present.

(2) When monitoring of high sump levels is required for radiological areas, which require protection from ground water infiltration and must be kept dry.

(3) When loss of electrical power impacts the ability to monitor needed automatic alarms.

Objective

The objective of this specification is to identify automatic alarms associated with the PBRF site and the proper response to these alarms. Automatic alarms include CV Door Open, Loss of Facility Electrical Power and Sump High Ground Water.

Specification

(1) Alarms shall annunciate in the Communication Center (CC) and the PBRF. The CC is continuously staffed.

(2) Alarms shall be in continuous operation except during maintenance. Maintenance actions must be complete within 24 hours or periodic physical inspections shall be prescribed for the duration of maintenance.

Limiting Conditions for Alarms

Alarms in "off normal" conditions indicate the possibility that:

(1) The CV has been improperly accessed, possibly effecting containment;

(2.) Ground water infiltration may be in progress within areas that must ordinarily be "kept dry";

(3) Facility and sump pump electrical power was lost resulting in a loss of automatic alarm monitoring and protection from ground water infiltration.

Actions to be Taken for Alarms

Alarms in "off normal" conditions shall be visually investigated in order to determine any cause. This investigation shall be conducted as soon as possible, and within one hour of annunciation. Additionally, the reports on the investigation of "off normal" conditions shall be made via appropriate telephone notifications to PBRF managers.

Bases

This specification ensures a response for abnormal conditions at PBRF when the source term is present and the CV is improperly accessed, possible ground water infiltration into "kept dry" areas is occurring or the loss of electrical power threatens the ability to monitor necessary automatic alarms. Responses to off normal alarms allow personnel to act on abnormal conditions as they are developing or otherwise in a timely manner in order to minimize or prevent radiation or hazardous exposures to workers, the general public or the environment.

3.3 Containment

Applicability

This specification shall apply to all decommissioning activities within the Reactor Building and all other work sites at PBRF when major portions of the source term are present.

Objective

(1) Define those activities and conditions that require containment, the means necessary for achieving and maintaining containment, and the required actions to be taken if containment is not maintained.

(2) Apply, to the extent practical, process or other engineering controls (e.g., containment, decontamination, or ventilation) to control the concentration of radioactive material in air.

Specification

All decommissioning activities that risk the generation of airborne radioactivity in excess of the DAC, and which cannot be controlled by other process or engineering controls, require containment.

Limiting Conditions for Maintaining Containment

(1) Within the Containment Vessel (CV), air lock and roll-up doors shall be kept closed except to facilitate personnel ingress or egress or while equipment is being passed through the doorway. Otherwise, CV integrity may be achieved by affixing common barrier materials (plywood, plastic sheeting, etc.) across air lock and roll-up doors in a manner, which would inhibit the free exchange of air into, or out of the Containment Vessel.

(2) Temporary, appropriately filtered radiological ventilation systems shall be used in conjunction with work in the CV or work within other containment devices at locations other than the Containment Vessel, whenever radiological engineering analysis indicates the risk of generating airborne radioactivity in excess of the DAC. Such ventilation systems shall be configured to promote negative pressure ventilation characteristics within the CV or other containment device, and shall not be configured to exhaust in such a way as to risk the spread of airborne radioactivity or transferable contamination outside of the containment barriers.

(3) When containment devices are opened as a matter of course for removal or insertion of equipment or personnel, ventilation systems shall be operated in a manner so as to produce a negative pressure within the containment, and all activities that could generate airborne contaminants shall be suspended.

(4) Entrances to the CV shall be made secure in such a way as to prevent unauthorized entry, except when the entrance is under the direct control of authorized personnel or if authorized personnel are already inside the Containment Vessel.

(5) The condition of the CV shall be maintained in a manner such that there are no unfiltered airflow pathways open directly to areas external to the containment building, except through air lock or roll-up doors when in use.

(6) To the maximum extent practical, decontamination of components, systems, structures and surfaces shall be performed or maintained as a matter of housekeeping or process engineering in order to minimize the generation of airborne radioactivity during the conduct of decommissioning activities.

Actions to be Taken if Containment is not Maintained

If containment is not maintained in accordance with this Specification:

(1) As soon as safe and practicable, all decommissioning work shall be suspended within the CV or other containment device as it may apply. It is anticipated that such work should cease within one hour or less.

(2) Restore containment as soon as possible.

Bases

Because of component activation and contamination levels, dismantlement activities associated with the removal of the reactor vessel internal contents, the reactor vessel, biological shield and other reactor systems on the PBRF site could cause airborne concentrations in excess of DAC. Maintaining containment and using process or engineering controls during decommissioning activities that have the potential of generating airborne radioactivity prevents the uncontrolled spread of contamination.

The restrictions and limitations in Specification 5.3.3 are necessary to provide assurance that an effective containment system will be established and maintained while there is a source term present.

The one-hour action time provided in Specification 5.3.3 allows an orderly suspension of activities in the event that containment requirements are not met. If CV integrity is not maintained, other work activities are permitted as long as appropriately filtered radiological ventilation fans operate in such a configuration that does not present the potential for outward airflow.

3.4 Ventilation Systems

Applicability

This specification applies to temporary ventilation systems used to prevent uncontrolled spread of airborne contamination during the PBRF decommissioning. Permanently installed ventilation systems at PBRF are no longer operable.

Objective

This specification describes the minimum requirements for operation and installation of temporary ventilation systems.

Specification

Activities that Require Ventilation

All decommissioning activities, which present the risk of generating airborne radioactivity, shall utilize an appropriately filtered ventilation system, or other process and engineering controls when possible, as described in limiting conditions and section 5.3.3. Permanently installed PBRF ventilation systems are no longer operable.

Limiting Conditions for Ventilation Systems

(1) During activities that require ventilation, ventilation systems shall be operated to ensure that air flow is from zones of lesser potential for airborne contamination to zones of greater potential for airborne contamination.

(2) Ventilation systems shall be designed to contain radioactive materials and to prevent the uncontrolled release of radioactive material.

(3) Ventilation systems may be of a localized type using temporary containment devices or may be configured in such a manner to provide air exchanges within the CV volume.

(4) Ventilation systems shall discharge through a particulate filter system capable of ensuring that air effluents comply with the requirements of 10 CFR 20.1101 and 1302, for unrestricted areas. Typically, these filters will be High Efficiency Particulate Air (HEPA) filters of 99.97% efficiency, or greater, for 0.3 micron particles.

Actions to be Taken if Ventilation System Requirements are not Maintained

If ventilation system requirements are not maintained, as soon as safe and practicable, suspend all activities within the area served by the inoperable ventilation system. It is anticipated that such work should cease within one hour or less.

If the exhaust release rates are such that effluent limits may be exceeded, immediately suspend activities causing the release. Implement corrective actions to ensure that further releases are within limits.

Bases

The PBRR CV adequately contains the PBRF source term. However, as an additional conservative measure, whenever decommissioning activities are in progress within the CV or any PBRF structure, which could also generate airborne radioactivity, a temporary radiological ventilation system will be used to minimize the spread of contamination to other areas.

The discharge filter and effluent monitor (see Specification 5.3.5) provide assurance that effluent concentrations are maintained within applicable dose limits for individual members of the public as required in 10 CFR 20.1302. The PBRF Decommissioning accident analyses do not take credit for filtered ventilation for any accidentally released radioactive materials, so no specific filter efficiencies are required. The only requirement for exhaust filter installations is that air effluents must comply with the requirements of 10 CFR 20.

The restrictions and limitations in Specification 5.3.4 are necessary to provide assurance that an effective ventilation system will be established and maintained.

The one-hour action time provided in Specification 5.3.4 allows orderly suspension of activities in the event that the conditions specified for maintaining ventilation system requirements are not met. Immediate actions are appropriate to correct effluent releases that could exceed 10 CFR 20 limits.

3.5 Radiation and Effluent Monitoring Systems

Applicability

This specification applies to those devices either permanently installed or portable, used to detect radiation and/or contamination levels and to monitor effluents released, if any, from decommissioning activities.

Objective

This specification describes the minimum radiological instrument capabilities that must be available to protect workers and to ensure that any released effluents meet regulatory requirements.

Specifications

Requirements for Monitoring Equipment and Systems

Radiological monitoring instrumentation must be available for use as follows:

(1) Airborne Activity Monitors – Both portable and/or stationary effluent, general area, continuous air monitoring devices, and personal air sampling devices shall be used, as necessary, within PBRF and appropriately located to support activities in progress.

(2) Radiation Detection Instrumentation – An adequate number of portable and stationary instruments of sufficient accuracy and sensitivity shall be available to ensure compliance with the radiation monitoring and measurement requirements of 10 CFR Part 20 including beta-gamma survey meters (up to 1000 R/hr) for radiation dose rates and surface contamination measurement (up to 500,000 cpm) and alpha survey meters for surface contamination (up to 50,000 cpm).

(3) Lab Counting Instrumentation/Methods – gamma spectroscopy and other standard lab counting methods.

All radiation monitoring and analytical equipment shall be controlled and tested to industry standards such as ANSI N323 series.

Actions to be Taken if Required Radiation Monitors are not Operable

If stationary monitors are inoperable, within one hour, install suitable portable instruments or perform additional, periodic surveys or analyses under direction of the Radiation Safety Officer, as substitutes for any of the monitors in this section.

With no operable radiation monitors or applicable surveys or analyses, suspend all activities until corrective actions are implemented.

Bases

The monitoring systems described in 5.3.5 provide assurance that the radiation levels and the concentration of airborne radioactive material in working areas are properly and accurately measured during decommissioning activities.

3.6 Effluent and Environmental Monitoring

Applicability

This specification applies at all times, to the following:

(1) All decommissioning activities.

(2) Tritium monitoring associated with the Reactor Tank (RT) Nitrogen purge throughout the time that such purging is performed prior to RT removal.

Objective

This specification assures that air and liquid effluents released from the facility conform to the requirements of 10 CFR 20, and that environmental monitoring is performed to confirm the effectiveness of effluent controls.

Specifications

(1) Limiting Conditions for Air Effluents. Radioactive material discharged to the atmosphere from the decommissioning activities shall conform to the requirements of 10 CFR 20.1101 and 1302.

(2) Limiting Conditions for Liquid Effluents. Liquid effluents exceeding the effluent concentration limits of 10 CFR Part 20, Appendix B, Table 2, Column 2 shall be appropriately handled and processed.

Actions

If air or liquid effluents are determined to exceed the limitations of specifications 5.3.5 or 5.3.6 above, activities that produce those effluents shall be immediately suspended until appropriate corrective actions are implemented. It is anticipated that such work should cease within one hour or less.

Bases

Effluents produced during decommissioning activities must continue to meet the radiation protection requirements of 10 CFR 20. The PBRF environmental monitoring standards specified in Specification 5.3.6 will continue to verify the environmental impacts of radiological releases from the facility, if any occur. The one-hour action time provided in Specification 5.3.6 allows orderly suspension of activities in the event that effluent air fails to conform to the requirements of 10 CFR 20.1101 and 1302. This monitoring program examines air, water, soil, sediment, and other representative environmental media in the surrounding area.

4.0 SURVEILLANCE REQUIREMENTS

4.1 Surveillance, Inspection and Maintenance

Applicability

This specification applies to the surveillance, inspection and maintenance requirements for PBRF buildings, systems and conditions.

Objective

Provide surveillance, inspection and maintenance of PBRF buildings, systems and conditions such that the safety and well-being of PBRF personnel, the general public and the environment are assured, as well as ensuring that PBRF building and system functions support decommissioning.

Specifications

Procedures shall be written that specify the performance of routine surveillance, inspection and maintenance for various PBRF buildings, systems and conditions, and for the environment as follows:

(1) Integrity and Function of PBRF Structures, the CV and Other Containment Devices as they apply to decommissioning

(2) PBRF Fence and Building Security

(3) Radiation Safety

(4) Fire Safety

(5) Environmental Safety

Bases

Compliance with these specifications provides assurance that PBRF buildings, systems and conditions are maintained in an effective state of readiness, integrity and function so as to facilitate safe working conditions, prevent an uncontrolled spread of radioactivity from the site, restrict unauthorized access to the PBRF site, protect capital assets, prevent exposure to radioactivity without implementation of proper radiological controls and to manage environmental safety within the PBRF complex.

4.2 Containment

Applicability

This specification applies to the surveillance requirements for all containment devices used in PBRF decommissioning activities and the CV as long as major portions of the source term are present per specification 5.3.3.

Objective

This specification assures that all containment devices and the CV are maintained in a condition that provides an effective containment boundary.

Specifications

(1) At least annually and prior to initiation of any major phase of decommissioning, facility change records shall be reviewed and the CV shall be visually inspected to determine that there are no pathways open directly to the environment.

(2) At least once per month, a visual examination shall be performed to determine that the entrances/exits are locked or blocked closed whenever no one is inside of the containment building.

(3) At least weekly, inactive containment devices shall be inspected for adequacy of their intended purposes.

(4) At least daily and prior to use, containment devices used in decommissioning work shall be inspected for adequacy of their intended purposes.

Bases

Compliance with these specifications provides assurance that the CV and other containment devices are maintained as effective containment boundaries as long as they are needed.

4.3 Ventilation Systems

Applicability

This specification applies to temporary ventilation systems utilized to support decommissioning activities. Permanently installed PBRF ventilation systems are no longer operable.

Objective

To specify surveillance requirements that assure ventilation systems are operable when required.

Specifications

(1) At least once per week, whenever a ventilation system is required to be operating, verify that the direction of air flow is from zones of lesser potential for airborne contamination to zones of greater potential for airborne contamination.

(2) When a ventilation system is required to be operable, the exhaust air downstream of the filters shall be periodically sampled to show that the specified limits in 10 CFR 20.1302 are not exceeded.

(3) Prior to placing a ventilation system in service, verify that all materials of construction for the ventilation system are fire-resistant. All pre-filters shall be verified to be of a fire-resistant type and, where applicable, listed by Underwriters Laboratories of the Factory Mutual Research Corporation.

(4) Prior to placing a ventilation system filter housing in service, verify that it includes an instrument, device or multiple devices to indicate filter resistance and airflow rate.

(5) Prior to placing a ventilation system filter in service, after each ventilation system filter is replaced or after a ventilation system filter is handled in any manner that may effect the integrity of the filter, each filter shall be efficiency-tested to verify compliance with Technical Specification 5.3.4 Limiting Condition for Ventilation Systems (4).

Bases

Compliance with these specifications provides assurance that the ventilation systems are maintained as effective contamination barriers and are available when required.

4.4 Radiation and Effluent Monitoring

Applicability

This specification applies to the equipment and systems installed or used to detect radiation and/or contamination (e.g., laboratory counting instruments and portable radiation monitoring instrumentation).

Objective

This specification describes the check and calibration frequencies for laboratory counting instruments, and portable radiation monitoring instrumentation.

Specification

(1) Upon initial acquisition, after major maintenance, and at least annually, stationary and portable monitoring instruments shall be calibrated using NIST traceable services.

(2) At least quarterly, background and efficiency shall be measured on all laboratory instruments used for counting health physics samples, using standard sources.

(3) Prior to placing an effluent monitoring instrument into service, after major maintenance, and at least annually thereafter while in service, calibration of the ventilation effluent monitoring sampler and/or monitor shall be performed. These tests need not be performed if operation of the pertinent ventilation system is not required.

Bases

These specifications provide assurance that monitoring and analytical instrumentation will be functional when needed.

4.5 Effluents and Environmental Monitoring

Applicability

This specification applies at all times.

Objective

This specification defines the surveillance requirements to verify compliance with 10 CFR 20 requirements and to specify environmental monitoring requirements.

Specification

(1) Air Effluent Surveillance Requirements

Air effluent particulate monitors shall be examined at least once per week during decommissioning activities to verify compliance with 10 CFR 20 limits.

(2) Liquid Effluent Surveillance Requirements

Liquid effluents shall be sampled and analyzed prior to release, to determine whether they can be discharged directly or whether they require processing or dilution prior to discharge.

(3) Environmental Monitoring Requirements

The environmental monitoring requirements of the PBRF environmental monitoring program shall continue to be implemented throughout decommissioning activities.

(4) Lower Level of Detection for Sample Analyses

Table 2 illustrates the lower level of detection for air, liquid and environmental monitoring sample analyses:

Table 2: Lower Limit of Detection (LLD) for Sample Analyses

Analyses	Water (uCi/ml)	Air Particulate or Gases (uCi/ml)	Sediment (pCi/g, dry)
Gross Beta	$5x10^{-8}$ (1,1a)	$2 x10^{-12}$ (2,2b)	
Gross Alpha	$2x10^{-9}$ (3,3a)	$5 x10^{-15}$ (4, 4b)	
Cs-137, gamma spectroscopy	-	-	1 (5)
Sr-90, liquid scintillation	-	-	0.5 (6)

1. Strontium-90 (Sr-90) is the most restrictive beta-emitting nuclide in 10CFR20, Appendix B, Table 2. The Sr-90 effluent water concentration limit is $5x10^{-7}$uci/ml as specified by 10CFR20, Appendix B, Table 2. LLDs for beta-emitting radionuclides in PBRF environmental water monitoring analyses is set at one tenth this restrictive radionuclide's effluent concentration limit or $5x10^{-8}$uCi/ml.

1.a. The trigger level that specifies radionuclide specific analyses is set at $5x10^{-7}$uci/ml.

2. This LLD is one tenth of the dose constraint (10 CFR 20.1101) concentration for Strontium-90 (Sr-90), which is the most restrictive beta-emitting radionuclide in 10CFR20 Appendix B, Table 2. It has been adjusted upward for the fraction of prevailing wind direction (0.25) and an occupancy factor (50 hours/168 hours) for NASA personnel at Plum Brook working outside the PBRF fence line. Though discovery of Strontium-90 in environmental air sampling is not anticipated, LLDs for beta-emitting radionuclides in PBRF environmental monitoring analyses are based on this restrictive nuclide.

2.b. The trigger level that specifies radionuclide specific analyses is set at the dose constraint concentration or 2 $x10^{-11}$ uCi/ml.

3. Americium-241 (Am-241) is the most restrictive alpha-emitting nuclide in 10CFR20, Appendix B, Table 2. The Am-241 effluent water concentration limit is $2x10^{-8}$ uci/ml as specified by 10CFR20, Appendix B, Table 2. LLDs for alpha-emitting radionuclides in PBRF environmental water monitoring analyses are set at one tenth this restrictive radionuclide effluent concentration limit or $2x10^{-9}$uci/ml..

3.a. The trigger level that specifies radionuclide specific analyses is set at $2x10^{-8}$ uci/ml.

4.This LLD is one tenth of the dose constraint (10 CFR 20.1101) concentration for Americium-241 (Am-241), which is the most restrictive alpha-emitting radionuclide in 10CFR20 Appendix B, Table 2. It has also been adjusted upward for the fraction of prevailing wind direction (0.25) and an occupancy factor (50 hours/168 hours) for NASA personnel working outside the PBRF fence line. Though discovery of Americium-241 in environmental air sampling is not anticipated, LLDs for alpha-emitting radionuclides in PBRF environmental monitoring analyses are based on this restrictive nuclide.

4.b. The trigger level that specifies radionuclide specific analyses is set at 5 x 10^{-14} uci/ml.

5. The DCGL for Cs-137 in surface soils at PBRF has been established at 18 pci/gram. The LLD for Cs-137 in sediment is set at less than one tenth this value or 1pci/gram.

6. The DCGL for Sr-90 surface soils at PBRF has been established at 32 pci/gram. The LLD for Sr-90 in sediment is set at less than one tenth this value or 0.5 pci/gram.

Bases

The on-going PBRF program for effluent and environmental monitoring will assure that radiation level measurements, representative samples of airborne radioactive material, water, stream silt, and soil will be collected. These programs are comprehensive and appropriate for the decommissioning work. Additional workplace airborne monitoring may be performed to monitor for compliance with 10 CFR 20 requirements during those decommissioning activities with the potential for creating airborne contamination that could be released to the environment.

5.0 SITE FEATURES

A site characterization report has already been prepared for this project. The PBRF is located at the NASA Plum Brook Station Site near Sandusky, OH and is owned by the United States Government and operated by the National Aeronautics and Space Administration (NASA). The distance from the reactor building to the posted PBS site boundary is about 0.5 miles. Access to the PBRF controlled area will be limited through the use of physical barriers and appropriately trained personnel. The Plot Plan for the PBRF site is included in Figure 1.

The controlled area, as defined in 10 CFR Part 20 of the Commission's regulations, shall be the area enclosed by the chain link fence around the 27-acre PBRF area. The restricted area, as defined in 10 CFR Part 20, shall be specific areas within the PBRF fenced area. These restricted areas will be routinely updated and modified as the decommissioning proceeds, but all will be contained within the larger 27-acre area.

6.0 ADMINISTRATIVE CONTROLS

6.1 Organization

The organization responsible for the management and decommissioning of the Plum Brook Reactor Facility is the National Aeronautics and Space Administration (NASA). NASA shall use the organizational management structure for these activities as stipulated in the PBRF Decommissioning Plan. Other organizational levels/staff may be added to meet specific facility needs. NASA shall provide the necessary resources required to ensure that the decommissioning is performed in a manner that poses no hazard to the general public or to the environment.

Figure 2 shows the decommissioning project organization chart.

(1) Level 1 – Glenn Research Center directorate is responsible for assuring compliance with the reactor facility license and providing regulatory reports and correspondence. The Director shall have overall responsibility for the license and the subsequent decommissioning and license termination.

(2) Level 2 - The Decommissioning Project Manager shall be responsible for overall on-site operation in safe storage and through license termination. This includes administering programs that assure the proper operation, control, and safeguards are maintained for PBRF. The PBRF Decommissioning Project Manager or his designee shall approve, prior to implementation, each phase of decommissioning or license termination that affect nuclear safety.

(3) Level 3 - The Decommissioning Senior Project Engineer shall be responsible for day-to-day supervision of PBRF activities.

6.1.1 Responsibilities

Responsibility for the reactor facility shall be with the chain of command as specified above in 5.6.1. Individuals at the various management levels, in addition to having responsibility for policies and activities conducted at the PBRF, shall be responsible for safeguarding facility personnel, the public and the environment from undue radiation exposures, including releases to the environment and for adhering to all requirements of the facility license and technical specifications of the same.

In all instances, responsibilities of one level may be assumed by designated alternates or by higher levels, conditional upon appropriate qualifications.

6.2 Level 1 Directorate

The GRC Director shall be responsible for assuring compliance with the reactor facility's license and providing regulatory reports and correspondence. He or she shall have overall responsibility for the decommissioning of the facility. The Directorate shall provide the resources to complete the decommissioning.

6.3 Decommissioning Program Manager

The NASA Decommissioning Program Manager (PgM) will assure and direct the safe decontamination and decommissioning of the PBRF and has ultimate responsibility for the decommissioning project. The PgM will track the overall project schedule and budget and will interface directly with GRC management and NASA Headquarters. The PgM will serve as the primary point of contact between NASA GRC and the USACE Project Manager.

6.4 Decommissioning Project Manager

The Decommissioning Project Manager shall be responsible for planning and directing all decommissioning activities and will maintain the ultimate responsibility for safely completing the decommissioning.

6.5 Senior Project Engineer

NASA's Senior Project Engineer will provide direct oversight of PBRF decommissioning activities for Glenn Research Center Management and will serve as NASA's management representative for activities on site. The Senior Project Engineer will have direct authority over all activities that take place at the PBRF and will be the primary interface with the USACE Civil Engineer.

6.6 Project Radiation Safety Officer (Project RSO)

The Project RSO shall be responsible for organization, administration, and direction of the radiological control and monitoring program, and shall assure that the program is adequately performed. The Project RSO shall be responsible for providing on-site advice, technical assistance, and review in all areas related to radiological safety.

6.7 Decommissioning Safety Committee (DSC)

The DSC is established to conduct reviews of all matters with safety implications relative to activities at PBRF, and will provide an executive level overview of PBRF activities. The DSC will have the authority to review any and all programs, plans, and procedures that may have an impact on the safety and health of workers and the public to ensure compliance with all applicable federal, state, and local regulations. The DSC will also be available to provide advice, technical expertise, and guidance to minimize health hazards associated with PBRF activities. The authority to fulfill this responsibility and perform these functions will be granted by the Chairman of the Glenn Executive Safety Board.

A prime consideration of the Committee's activities will be to ensure that all public and employee radiation exposures are maintained as low as reasonably achievable.

DSC activities shall be performed under a written charter or directive containing the following information as a minimum:

(1) Members of the Decommissioning Safety Committee will include:

a. Decommissioning Program Manager (NASA)

b. Radiation Safety Officer (NASA)

c. Chief, Construction Management Branch (NASA)

d. GRC Safety Officer (NASA)

e. GRC Environmental Management Office Chief (NASA)

f. 2-NASA Engineers - Nuclear, Environmental, Safety, Civil, Structural, Mechanical, Electrical

(2) One of the above committee members will serve as chair for the committee.

(3) The Chairman of the Decommissioning Safety Committee shall have a bachelor's degree in engineering or a related physical science.

(4) The DSC quorum shall be composed of not less than three members who collectively provide experience in radiation safety and protection, industrial safety, environmental safety, waste management and program management. In specific instances the Committee will designate the Chairman to act in its stead, and the Chairman will report his or her actions to the Committee at its next regular meeting.

(5) The DSC shall meet semi-annually, and at other times when circumstances warrant. Minutes of DSC proceedings, including recommendations or occurrences, shall be distributed to all DSC members and the Director.

(6) The DSC shall be responsible for the review of the following:

a. Proposed activities that could affect personnel or facility safety or result in an uncontrolled release of radioactivity in excess of 10 CFR 20 limits, and that are conducted without NRC approval to verify that the proposed activity does not constitute a change in Technical Specifications or an un-reviewed safety question.

b. Proposed changes to the facility or organizational processes that could affect radiation safety and that are to be completed without prior NRC approval in order to verify the activity does not constitute a change in the Technical Specifications or any un-reviewed safety question.

c. Organizational processes, which are used to develop the conduct of decommissioning functions, or that are determined to have a significant effect on radiation safety.

d. Proposed changes to the Technical Specifications or the facility license.

e. Violations of the Federal regulations, Technical Specifications, or facility license requirements.

f. Unusual or abnormal occurrences which are reportable to the NRC under provisions of the Federal regulations.

g. Internal and external audit results and the adequacy of corrective actions. Such reviews shall be performed at least once per calendar year. Intervals between such reviews are not to exceed 15 calendar months.

(7) The DSC shall perform annual reviews of records in order to determine compliance with internal rules, procedures, and regulations and with licensed provisions in the Technical Specifications. Such reviews shall be documented and reported to the Director. Intervals between such reviews are not to exceed 15 calendar months.

(8) Records of all DSC activities and decisions shall be retained for the duration of the decommissioning project.

6.8 Project Safety Committee (PSC)

The PSC is comprised of on-site project management. The PSC shall exercise review and approval authority over any and all programs, plans, decisions and procedures that may have impact on the safety and health of workers and the public. The PSC shall assure activities at PBRF comply with all applicable federal, state and local regulations, and these Technical Specifications. The PSC shall be subject to the authority of the DSC on matters associated with licensed activities.

PSC activities shall be performed under a written charter or directive containing the following information as a minimum:

(1) The PSC shall be composed of the following on-site project management team:

a. NASA Decommissioning Project Manager (Chairman)

b. NASA Decommissioning Senior Project Engineer (Chairman alternate)

c. NASA Environmental Manager

d. Project Radiation Safety Officer

e. Project Health and Safety Officer

f. Other Environmental, Health and Safety professionals as required

(2) The PSC shall meet monthly, and at other times when circumstances warrant. A quorum shall consist of not less than three members of the PSC membership and shall include the chairman or his designated alternate. Minutes of PSC proceedings, including recommendations or occurrences, shall be distributed to all PSC and DSC members, and the Director.

(3) The PSC shall be responsible for the following:

a. Review and approval of proposed activities that could affect personnel or facility safety or result in an uncontrolled release of radioactivity in excess of 10 CFR 20 limits, and that are conducted without NRC approval. The PSC shall verify that the proposed activity does not constitute a change in Technical Specifications or any un-reviewed safety question.

b. Review and approval of proposed changes to the facility or to procedures that could affect radiation safety and that are to be completed without prior NRC approval. The PSC shall verify the activity does not constitute a change in the Technical Specifications or any un-reviewed safety question.

c. Review and approval of all new procedures and revisions thereto, which direct the conduct of decommissioning functions or that are determined to have a significant effect on radiation safety.

d. Review, approve, and forward to the DSC any proposed changes to the Technical Specifications or the facility license.

e. Assess and report violations of the Federal regulations, Technical Specifications, or facility license requirements.

f. Assess and report unusual or abnormal occurrences which are reportable to the NRC under provisions of the Federal regulations.

g. Perform internal audits on decommissioning records and the performance of the decommissioning contractor's compliance with applicable Federal regulations, Technical Specifications, and facility license requirements. Such audits shall be performed at least once per calendar year. Intervals between such reviews are not to exceed 15 calendar months.

h. Records of all PSC activities and decisions shall be reported to the DSC, and shall be retained for the duration of the decommissioning project.

(4) The PSC shall be responsible for the review of the following:

a. Proposed activities that could affect personnel or facility safety or result in an uncontrolled release of radioactivity in excess of 10 CFR 20 limits, and that are conducted without NRC approval to verify that the proposed activity does not constitute a change in Technical Specifications or any un-reviewed safety question.

b. Proposed changes to the facility or to procedures that could affect radiation safety and that are to be completed without prior NRC approval in order to verify the activity does not constitute a change in the Technical Specifications or any un-reviewed safety question.

c. All new procedures and revisions thereto that direct the conduct of decommissioning functions or that are determined to have a significant effect on radiation safety.

d. Review of violations of the Federal regulations, Technical Specifications, or facility license requirements.

e. Review of unusual or abnormal occurrences which are reportable to the NRC under provisions of the Federal regulations.

6.9 AUDIT REQUIREMENTS

6.9.1 Internal Audits

Internal audits of decommissioning activities shall be performed as part of a Quality Assurance Program that meets the requirements of 10 CFR 50 Appendix B and ANSI/ANS 15.10 (1994). Audits shall include selective, but comprehensive, examinations of activities, records and documents with cognizant personnel, and observation of operations as appropriate. Audit personnel shall be technically qualified and should not have been involved in the performance of the activity being audited. Audits shall include the following:

(1) Facility activities for conformance to the Technical Specifications and license, at least once per calendar year (interval between examinations not to exceed 15 months).

(2) The qualifications of the staff, at least once every other calendar year (interval between examinations not to exceed 30 months).

(3) The results of actions taken to correct those deficiencies that may occur in the reactor facility equipment, systems, structures, or methods of operations that affect facility safety, at least once per calendar year (interval between examinations not to exceed 15 months).

Deficiencies that affect facility radiation safety shall immediately be reported to Level 2 management. A written report of the findings of each audit shall be submitted to Level 2 management and the manager of the radiation safety function within one month after the audit has been completed.

6.9.2 Independent Reviews

Independent reviews of decommissioning activities and records shall be performed at least annually. Personnel performing these reviews shall be appropriately qualified and experienced, and be members of, or appointed by the Executive Safety Board. These reviews shall include an assessment of the PSC and the project Quality Assurance and Audit programs' ability to identify and correct deficiencies. Results of these independent reviews shall be provided to the Level 1 Directorate as well as to the DSC and PSC.

6.10 PROCEDURES

Written procedures, including ALARA, shall be prepared and approved prior to initiating any decommissioning activities listed in this section. Procedures for the following activities may be included in a single manual or set of procedures or divided among various manuals or procedures:

(1) Routine maintenance on major components or systems that could have an effect on radiation safety.

(2) Surveillance tests and calibrations required by the Technical Specifications or those that have an effect on radiation safety.

(3) Personnel radiation protection consistent with applicable regulations.

(4) Administrative controls for maintenance and for the conduct of activities that could affect facility radiation safety.

(5) Shipping and receipt of radioactive material.
(6) Waste Management

(7) Quality Assurance

(8) Environmental Protection Management

(9) Health and Safety Management

Changes to the above procedures shall be made effective only after approval by the PSC. Minor modifications to the original procedures, which do not change their original intent may be made as a temporary change by Level 3 or higher and shall be documented. The Radiation Safety Committee must review all temporary changes that affect radiation safety within the following 45 days. All changes (except one-time deviations) shall be incorporated into the written procedures.

6.11 REQUIRED ACTIONS

The following actions shall be taken in the event of an occurrence of the type identified in 5.6.13.2(1)(a) or 5.6.13.2(1)(b):

(1) Reactor facility conditions shall be returned to normal or the activities in progress stopped. If it is necessary to stop the activities in progress to correct the occurrence, operations shall not resume unless authorized by Level 2 or the designated alternates.

(2) Occurrences shall be reported to the Level 2 or designated alternates and to the NRC as required.

(3) Occurrences shall be reviewed by the Project Safety Committee.

6.12 REPORTS

All reports shall be addressed to the U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Document Control Desk, with a copy to the U.S. Nuclear Regulatory Commission, Regional Administrator, Region 3.

6.12.1 Annual Report

Annually submit to the NRC a report containing the following:

(1) A narrative summary of facility activities.

(2) Tabulation of the major preventative and corrective maintenance operations having safety significance.

(3) A brief description of the major changes in the reactor facility and procedures and activities significantly different from those performed previously and not described in the facility safety analysis report, and a summary of the safety evaluation that shows no un-reviewed safety questions were involved.

(4) A summary of the nature and amount of radioactive effluents released or discharged to the environs beyond the effective control of the licensee as determined at or before the point of such releases or discharge. The summary shall include to the extent practical an estimate of the major individual nuclides present in the effluent.

(5) A summarized result of the environmental survey performed outside the facility.

6.12.2 Special Reports

Special reports used to report unplanned events as well as planned major facility or administrative changes shall be submitted in accordance with the following schedule.

(1) There shall be a report no later than the following working day by telephone and confirmed in writing by telegraph or similar conveyance to the NRC to be followed by a written report that describes the circumstances of the event within 14 days of any of the following:

(a) Release of radioactivity from the site above allowed limits

(b) Any of the following:

Activities in violation of limiting conditions for the conduct of activities established in the technical specification unless prompt remedial action is taken.

An observed inadequacy in the implementation of administrative or procedural controls such that the inadequacy causes or could have caused the existence or development of an unsafe condition with regard to facility operations.

(2) A written report within 30 days to the NRC of:

(a) Permanent changes in the facility organization management personnel (Level 1 or 2).

(b) Significant changes in the accident analysis as described in the decommissioning plan safety analysis.

6.13 RECORDS

Records may be in the form of correspondence, reports, logs, data sheets, or other suitable forms. The required information may be contained in single or multiple records or a combination thereof.

6.13.1 Retention of Records

The following records are to be maintained for a period of at least five years or for the life of the component involved if less than five years:

(1) Facility decommissioning operations (but not including supporting documents such as check lists, log sheets, etc which shall be maintained for a period of at least one year.)

(2) Principal maintenance and project activities

(3) Reportable occurrences

(4) Surveillance activities required by the technical specifications

(5) Reactor facility radiation and contamination surveys where required by applicable regulations

(6) Approved changes in operating procedures

(7) Records of meetings and independent examination reports of the review and independent examination group

6.13.2 Records to be Retained for the Lifetime of the Facility:

NOTE: Applicable annual reports, if they contain all of the required information, may be used as records in this section.

(1) Air and liquid radioactive effluents released to the environment.

(2) Off-site environmental monitoring surveys required by the Technical Specification

(3) Radiation exposure for all personnel monitored.

(4) Drawings of the reactor facility.

(5) Records of disposal of licensed material.

6.14 HIGH RADIATION AREA

6.14.1 Access Controls

Pursuant to 10 CFR 20, in lieu of the 'control device' or 'alarm signal', each high radiation area as defined in 10 CFR 20, shall be barricaded and conspicuously posted as a high radiation area and entrance thereto shall be controlled by requiring issuance of a Radiation Work Permit (RWP). Individuals qualified in radiation protection procedures (e.g. Health Physics personnel) or personnel continuously escorted by such individuals may be exempt from the RWP issuance requirement during the performance of their assigned duties in high radiation areas with exposure rates equal to or less than 1000 mR/hr, provided they are otherwise following plant radiation protection procedures for entry into such high radiation areas. Any individual or group of individuals permitted to enter such areas shall be provided with or accompanied by one or more of the following:

(1) A radiation monitoring device which continuously indicates the radiation dose rate in the area, or

(2) A radiation-monitoring device, which continuously integrates the radiation dose rate in the area and alarms when a pre-set integrated dose is received. Entry into such areas with this monitoring device may be made after the dose rate level in the area has been established and personnel have been made knowledgeable of them, or

(3) A health physics qualified individual (i.e. qualified in radiation protection procedures) with a radiation dose rate monitoring device who is responsible for providing positive control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified by the facility Health Physics staff in the RWP.

6.14.2 Control of High Radiation Areas

In addition to the requirements of 5.6.16.1, areas accessible to personnel with radiation levels greater than 1000mR/hr at 45 cm (18 inches) from the radiation source or from any surface, which the radiation penetrates, shall be provided with locked enclosures to prevent unauthorized entry, and the keys shall be maintained under the administrative control of health physics. Enclosures shall remain locked except during periods of access by personnel under an approved RWP, which shall specify the dose rate levels in the immediate work area and the maximum allowable stay times for individuals in the area. Direct or remote continuous surveillance (such as the use of closed circuit TV cameras) may be used by personnel qualified in radiation protection procedures in lieu of the stay-time specification of the RWP in order to provide positive exposure control over the activities within the area.

For individual areas accessible to personnel with radiation levels of greater than 1000 mR/hr that are located within large areas, where no enclosure exists for purposes of locking, and no enclosure can be reasonably constructed around the individual areas, then that area shall be barricaded, conspicuously posted, and a flashing light shall be activated as a warning device whenever the dose rate in the area exceeds or will shortly exceed 1000 mR/hr.

7.0 REFERENCES

"Decommissioning Plan for the Plum Brook Reactor Facility, Rev 2", submitted by National Aeronautics and Space Administration – Glenn Research Center, Plum Brook Station, Sandusky, OH to the U.S. Nuclear Regulatory Commission, October 2001.

"An Evaluation of the Plum Brook Reactor Facility and Documentation of Existing Conditions", prepared by Teledyne Isotopes Inc for NASA-Lewis Research Center, Cleveland, OH, December 1987.

"The Development of Technical Specifications for Research Reactors", ANSI/ANS-15.1-1990, prepared by American Nuclear Society Standards committee Working Group ANS-15.1, American Nuclear Society, LaGrange Park, IL, December 1990.

"Decommissioning of Research Reactors", ANS/ANSI 5.10-1994, prepared by American Nuclear Society Standards Committee Working Group ANS 5.10, American Nuclear Society, LaGrange Park, IL, November 1994.

"Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors" (Part 1, Format and Content), prepared by the Office of Nuclear Reactor Regulation, Nuclear Regulatory Commission, February 1996.

Code of Federal Regulations, Title 10, "Energy" Part 20, "Standards for Protection Against Radiation", U.S. Government Printing Office, Washington, DC.

Attachment:

Figure 1	Plum Brook Reactor Facility Plot Plan
Figure 2	Plum Brook Reactor Facility Decommissioning Project Organizational Structure

AMENDMENT TO LICENSE NO. R-93

Docket No. 50-185

General Information

Pursuant to 10 CFR 50.33, the following information is provided to support the request for an Amendment to License R-93, Docket No. 50-185.

1. Applicant - National Aeronautics and Space Administration.

2. Address – Glenn Research Center
21000 Brookpark Road
Cleveland, OH 44135

3. Class of License – 104; Possess-Do-Not-Operate.

4. Use of Facility – The facility has no fuel and the reactor is in a protected safe storage condition.

5. Period of Time for which License is Sought – Completion of decommissioning and license termination.

6. Financial Qualification – Being an agency of the United States Government, NASA is financially qualified to possess the requested license.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

DOCKET NO. 50-185

PROPOSED AMENDED FACILITY LICENSE

License No. R-93
Amendment No. 8

1. The proposed amendment to facility License No. R-93, Docket No. 50-185 should read as follows:

This license applies to the heterogeneous light water-cooled and moderated research reactor [herein referred to as the Mock-Up Reactor (MUR)] owned by the National Aeronautics and Space Administration (NASA), an independent agency of the United States Government and located at the NASA Plum Brook Station near Sandusky, OH. The MUR is described in the application dated March 15, 1961, and amendments thereto, including:

AMENDMENT NO. 2 FOR STANDBY
Application – March 26, 1973
Supplement - May 18, 1973

AMENDMENT NO. 3 FOR PROTECTED SAFE STORAGE
Application – July 26, 1985

AMENDMENT NO.4 FOR CHANGE OF ADMINISTRATIVE OVERSIGHT
Application – February 27, 1989
Supplement - June 22, 1989

AMMENDMENT NO. 5 FOR CONTINUED SAFE STORAGE
Application – November 4, 1996
Supplement - December 20, 1996
- September 18, 1997
- March 30, 1998
- April 13, 1998

AMENDMENT NO. 6 FOR ORGANIZATIONAL NAME CHANGE
Application – August 10, 1999

AMENDMENT 7 FOR INTERNAL TRANSITION OF LICENSE RESPONSIBILITY
Application – November 2001

2. Subject to the conditions and requirements incorporated herein, the U.S. Nuclear Regulatory Commission hereby licenses NASA:

3. (3) Pursuant to the Act and 10 CFR Parts 30 and 40 to receive, possess and use in amounts as required any byproduct or source material without restriction to chemical or physical form for instrument and equipment calibration, associated with radioactive apparatus or components or activities incident to "possess-do-not-operate" status.

5. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 8, are hereby incorporated in this license, and changes therein may be made only when authorized by the Commission in accordance with the provisions of 10 CFR Part 50, Section 50.59.

SIGNIFICANT HAZARDS CONSIDERATION ANALYSIS AND ENVIRONMENTAL EVALUATION OF PROPOSED AMENDMENT TO LICENSE R-93, DOCKET NO. 50-185

I. SIGNIFICANT HAZARDS CONSIDERATION ANALYSIS

An evaluation was performed on whether or not significant hazards consideration is involved with the proposed changes by focusing on the three standards set forth in 10CFR50.92(c). The conclusions to this analysis are presented in the following:

1. Do the proposed changes involve a significant increase in the probability or consequences of an accident previously evaluated?

A. Amendment to the license condition that allows receipt, possession and use of byproduct and source materials as part of pre-decommissioning activities.

(1) The receipt, possession and use of radioactive material in this amendment would not significantly increase the source term, nor would it add new forms of effluents at PBRF site. Only low levels of radioactivity are associated with the incidental receipt, possession, use and shipment of radioactive materials associated with pre-decommissioning activities under the "possess-do-not-operate" status.

(2) Furthermore, the activities associated with the receipt, possession and use of these radioactive materials, and all conveyance of byproduct and source materials would be governed through the implementation of additional PBRF procedures as governed by the proposed amended Technical Specifications. Previously evaluated potential accidents would be adequately bounded by these new procedures without significant increases in their probability or consequences.

B. Amendment that replaces the Technical Specifications to support decommissioning activities.

The proposed revision to the Technical Specifications prescribes NRC-approved methods and standards for the effective control of decommissioning activities, and provides for considerable safety oversight of those activities, reducing the likelihood and hazard implications for existing plausible accidents already considered in the current license.

SUMMARY

The changes in the proposed amendment of the license condition and Technical Specifications facilitates controlled reduction of the source term at PBRF, and would apply NRC-compliant methods and procedures to those activities. NASA considers there is no potential for an increase in the probability or consequences of an accident previously evaluated in association with the approval of this request.

2. Do the proposed changes create the possibility of a new or different kind of accident from any accident previously evaluated?

The decommissioning work activities facilitated by the requested changes to the license condition and Technical Specifications are consistent with the Commission's principles and limitations for decommissioning and safe storage activities. At PBRF only low levels of radioactivity remain, consistent with facilities that no longer possess fuel, and decommissioning activities, which do not present the possibility of a new or different kind of accident from any accident previously identified.

3. Do the proposed changes involve a significant reduction in a margin of safety?

A. Amendment to the license condition that allows receipt, possession and use of byproduct and source materials as part of pre-decommissioning activities.

PBRF contains a non-operable test reactor and an inventory of radioactive materials generated as a result of previous operations. All reactor fuel and special nuclear material, as well as most waste byproduct materials were removed from the facility. Only low levels of radioactivity are associated with the intended receipt, possession and use of byproduct and source materials, and only in quantities and forms necessary to conduct work activities consistent with facility decommissioning. The ability to receive, possess and use byproduct and source materials will facilitate that actual reduction of total source term.

B. Amendment to the Technical Specifications that support decommissioning activities.

The proposed Technical Specifications would enhance the margin of safety over both decommissioning and safe storage activities through the addition of significant oversight and by prescribing NRC-compliant standards.

SUMMARY

The changes in the proposed amendment of the license condition and Technical Specifications will facilitate a reduction in the total source term at PBRF, and will impose additional controls over facility activities, achieving a greater margin of safety. NASA considers there is no significant reduction in a margin of safety associated with the approval of this amendment request.

II. ENVIRONMENTAL EVALUATION

NASA has determined that the proposed amendment to the license condition and Technical Specifications would do the following:

Authorize the possession of radioactive material incident to performing services such as installation, maintenance, leak tests and calibration as specified in 10CFR51.22(c)(14)(x); and authorize other use of source and byproduct material per 10CFR51.22(c)(14) (xvi), which are not listed, but which involve quantities and forms of source and byproduct material similar to those listed in 10CFR51.22(c)(14)(i) through (xv).

Amend the Technical Specifications pursuant to 10CFR50, changing requirements with respect to installation and use of facility components located with in the restricted area, as defined in 10 CFR20, and changing the inspection and surveillance requirements in such ways to be consistent with 10CFR51.22(c)(9)(i) through (iii).

SUMMARY

NASA has determined that the proposed changes meet the eligibility criterion for categorical exclusions set forth in 10CFR51.22(c)(9) and (14). Therefore, pursuant to 10CFR51.22(b), an environmental assessment regarding the proposed changes is not required.