

National Aeronautics and
Space Administration

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May 10, 2017

Reply to Attn of: QSH

U.S. Nuclear Regulatory Commission
Director, Office of Federal and State Materials
and Environmental Management Program
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Request to Remove Cyclotron Facility from License

Ref: License #34-00507-16, Docket #030-05626

The NASA Research Center (GRC) is submitting its Final Survey Report which summarizes radiological conditions within its Cyclotron Facility, also known as Building 140. The results of the surveys performed support removal of the Cyclotron Facility, including infrastructure and remaining installed equipment/components, from the GRC radioactive materials license, item A under sections 6, 7, 8, and 9. Note that this particular item on the NASA GRC license was added by amendment 34 in 2005 to cover "activated materials and components" associated with radiation effects testing of samples. Since this capability is still required, the GRC requests that only references to Cyclotron Facility activation products be removed from the current license. The revised possession item should be described as follows:

6. Any byproduct material between atomic numbers 3 and 83
7. Activation products
8. 200 millicuries total
9. For research and development as described in 10 CFR 30.4

As described in the enclosure, "Final Survey Report, NASA GRC Cyclotron Facility," the surveillance strategy for the site included use of a Multi-Agency Radiation Survey and Site Investigation Manual approach for areas with higher residual radioactivity levels, such as the cyclotron vault room and the associated beam tubes and beam dumps, as well as a more conservative survey method for other areas where no known volumetric contamination was present. This latter method involved comparison of surfaces in these areas with the maximum permissible contamination levels for unrestricted use found in the NASA GRC Occupational

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Health Programs Manual – Chapter 8, Radiation Protection for Radioactive Materials, a license tie-down document.


The residual radioactivity in the existing cyclotron vault room infrastructure and remaining equipment/components will not result in an estimated total effective dose equivalent (TEDE) to a member of the critical group in excess of 25 millirem (mrem) per year. The “building occupancy” dose-modeling scenario provided the most conservative estimate of a TEDE, which was less than 6 mrem per year. Additional modeling was performed in accordance with US Nuclear Regulatory Commission guidance document NUREG-1640, “Radiological Assessments for Clearance of Equipment and Materials from Nuclear Facilities,” to develop an upper bound of potential doses from plausible future “alternate scenarios” of not only the cyclotron vault infrastructure/equipment/components, but, the associated beam tubes/dumps as well. These alternate scenario analyses for recycling, renovation, and disposal demonstrate that potential doses are much less than 1 mrem per year to the maximally exposed individuals. In the areas of the Cyclotron Facility with no known residual volumetric activity, results of the surface contamination scans and fixed point contamination measurements were all well below NASA GRC’s maximum permissible contamination levels for unrestricted use. Similarly, all of the final removable contamination measurements for structural surfaces were below NASA GRC limits as well as the minimum detectable activity of the counting method employed.


Prior to the recent surveillances within the Cyclotron Facility structure, which are summarized above, monitoring and sampling were performed within the land areas above the Building 140 structure. This included systematic soil sampling and 100 percent direct gamma walkover scan of surface soils within the demarcated Cyclotron Facility footprint. No cyclotron-related radioactivity was found in any of these samples when analyzed by gamma spectroscopy and the gamma scans showed no elevated activity. In addition, core samples of the overburden soils immediately adjacent to the underground Cyclotron Vault room structure were collected from subsurface locations right above the Vault roof and adjacent to the Vault’s exterior walls, ranging from the top of the structure down to its footers. Gamma spectroscopy analysis of these subsurface soil samples showed limited activation in one isolated zone along the west outer wall of the Cyclotron Vault. The maximum concentration observed in these core samples was 11 percent of the NRC surface soil screening value found in Appendix H of NUREG 1757 - Volume II, Consolidated Decommissioning Guidance - Characterization, Survey, and Determination of Radiological Criteria.

All survey results characterizing the existing radiological conditions of the NASA GRC Cyclotron Facility meet the associated release limits as well as the As Low As Reasonably Achievable criteria. Any further remediation efforts of the very limited levels of cyclotron-related residual activity would present potential industrial safety and health hazards that are far more significant than whatever potential dose-reduction benefits might result from such endeavors. As such, the NASA GRC requests that its radioactive material license be amended as described above.

As previously described to Commission staff, the NASA GRC intends to demolish the Cyclotron Facility structure, backfill the excavation, and return the site to greenfield status. The prime contractor for the GRC cyclotron project plans to commence this phase of the project on July 10, 2017, with a planned completion date of November 2, 2017. Recognizing the desire to complete the work prior to the winter months along with benefit of being able to maintain certain key staff for the project duration, the NASA GRC respectfully requests that the Nuclear Regulatory Commission expedite its review of the enclosed report and associated licensing actions. A project delay associated with the licensing action could push the project into the winter months, which could present additional hazards to involved workers or even result in a seasonal work stoppage. Having to suspend the project for the winter months, leaving an open excavation and an exposed section of the adjacent building's foundation, would be an undesirable situation as there would be several associated industrial safety, environmental, structural integrity concerns.

The NASA GRC is committed to expeditiously working with Commission staff to provide additional information, answer questions, or resolve potential issues associated with this amendment request. For any such actions, please contact Mr. Christopher J. Blasio, Radiation Safety Officer, at (216) 433-6520.


Mark M. Kowaleski
Chief, Safety and Health Division

 5-5-17
Gene L. Stygles
Chief, Facilities Division

Enclosure: (1 compact disc):

Final Survey Report, NASA GRC Cyclotron Facility, Cleveland, Ohio, April 2017

cc:

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and Decommissioning Branch/M. LaFranzo

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