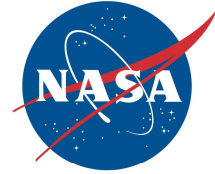


National Aeronautics and Space Administration

**George C. Marshall Space Flight Center**  
Marshall Space Flight Center, AL 35812



September 27, 2024

Reply to Attn of: AS01

TO: USNRC Region I  
Division of Radiological Safety and Security  
475 Allendale Road - Suite 102  
King of Prussia, PA 19406

FROM: AS10/Farley Davis

SUBJECT: Amendment Addendum to NASA Marshall Space Flight Center (MSFC) NRC  
Material License (01-06571-10)

MSFC is requesting that NRC License (01-06571-10) be amended to add two locations, Bldg. 4619, Room 155 and Bldg. 4487, Room BC105 for licensed americium-241/beryllium, americium-241, cobalt-60, and cesium-137 sources permitted under its NRC Materials License. Attachment (1) provides required information for your consideration.

Anthony Williams, RSO, is the point of contact for this matter should you require further information. He can be reached via phone at (757) 642-4471 or e-mail at [anthony.s.williams@nasa.gov](mailto:anthony.s.williams@nasa.gov).

**ELBERT DAVIS**

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Date: 2024.09.27 13:49:37 -05'00'

Mr. Farley Davis  
Manager, Environmental Engineering and  
Occupational Health Office

Enclosures: Attachment 1

cc:  
AS10/D. Thaxton  
ST12/J. Kolodziejczak  
AS10/A. Williams



ATTACHMENT 1

1. FACILITIES AND EQUIPMENT

**Building 4619**

**Room 155**

Room 155 is the west end highbay of 4619 and is the Environmental test facility (ETF which is part of ET20. The facility performs thermal vacuum testing (space simulation) on components, systems, and full spacecraft.

**Task Description #1:** Testing will be performed on space craft which could require alpha, beta, or gamma sources to include multiple exempt sources and licensed americium-241/beryllium (Am-241/Be) neutron sources. These sources will simulate the space environment that sensors of the spacecraft will witness in orbit and as such, validate its operation prior to launch. They will be used to test a variety of sensors inside of a sealed vacuum chamber under various environmental conditions, including pressure and heat. The sources will not be under vacuum during the experiments and the temperature range they will experience while testing will be -30°C to + 40°C.

**Task Description #2:** Testing will be performed on the StarBurst instrument hardware for gamma detection using an exempt gamma source inside of a thermal vacuum chamber under vacuum and various temperature changes. Thermal testing will occur from 45°C to -30°C for one cycle and all other cycles from -25°C to 30°C. The vacuum environment will be between  $10^{-3}$  to  $10^{-6}$  torr.

Another instrument test may be performed using a licensed Am-241 source and multiple exempt gamma sources in an open environment (i.e., outside of a chamber). This involves placing the sources near the instrument to detect a reading point that is distinguishable from the exempt source's reading point.

Finally, if deemed necessary, an additional instrument test may be performed using a licensed Co-60 source in an open environment.

**Building 4487**

**Room BC105**

Room BC105 is used for flight hardware integration in a 10k clean room and also for X-ray testing of telescopes in vacuum.

**Task Description:** Testing will be performed following StarBurst instrument assembly and component integration including software to ensure the instrument is functioning properly. The test will be conducted in an open environment using an exempt gamma source. Another



**ATTACHMENT 1 (cont'd)**

test will then be performed in an open environment using a licensed Am-241 source and multiple exempt gamma sources. The test will verify the characterization of the distinct elements of the instrument. Finally, a Limited Source Survey (LSS) test will be performed to verify the instrument is ready to be sent to a location outside of MSFC at a later date. The instrument verification will utilize a licensed Cs-137 source and may also utilize a licensed Co-60 source for the same testing set-up.

All licensed sources mentioned in Tasks #1 and #2 are permitted under Marshall Space Flight Center's NRC Materials License (01-06571-10).

The locations of Bldgs. 4619 and 4487 are identified in Figure 1, and a summary of licensed sources to be used based on location are noted in Table 1.

**2. RADIOLOGICAL CONTROLS**

a. The Radiation Safety Officer (RSO) or Assistant RSO will transport all radioactive sources, exempt or licensed, from Bldg. 4249, Room 114 to Bldg. 4619, Room 155 and Bldg. 4487, Room BC105 as required. The sources will be handed off to authorized personnel who are trained as radiation workers, to place them into a chamber or in an open space. This evolution will be monitored by the RSO or ARSO.

b. For chamber testing, the following tasks will be performed:

- i. Posting of "Caution Radioactive Materials Inside" when radioactive sources are placed inside the chamber.

*Note: The sealed chamber under vacuum is considered secured storage; therefore, the source(s) will not require constant surveillance by the authorized user conducting the experiments.*

- ii. If deemed necessary, a radiological control area will be established outside of the chamber with appropriate signage.
- iii. If deemed necessary, following the end of the experiment, the RSO or ARSO will frisk and conduct smear surveys, inside the chamber or any sealed container that encloses the sources to monitor for contamination.

c. The LSS test will be conducted with the licensed Cs-137 source inside of a shielded vessel that will contain a collimator for beam focus. The licensed Co-60 source will be placed inside of the shielded vessel if testing using the source is conducted.



## **MSFC RADIOACTIVE MATERIALS LICENSE AMENDMENT**



### **ATTACHMENT 1 (cont'd)**

- d. For testing that occurs with licensed sources in an open area, a radiologically controlled area will be established with appropriate signage.
- e. When the radioactive sources are no longer required for testing, the RSO or ARSO will transport them back to Bldg. 4249, Room 114, for secured storage.

#### **3. RADIATION SAFETY PROGRAM**

No changes in the radiation safety program.

#### **4. WASTE MANAGEMENT PROGRAM**

No changes in the waste management program.



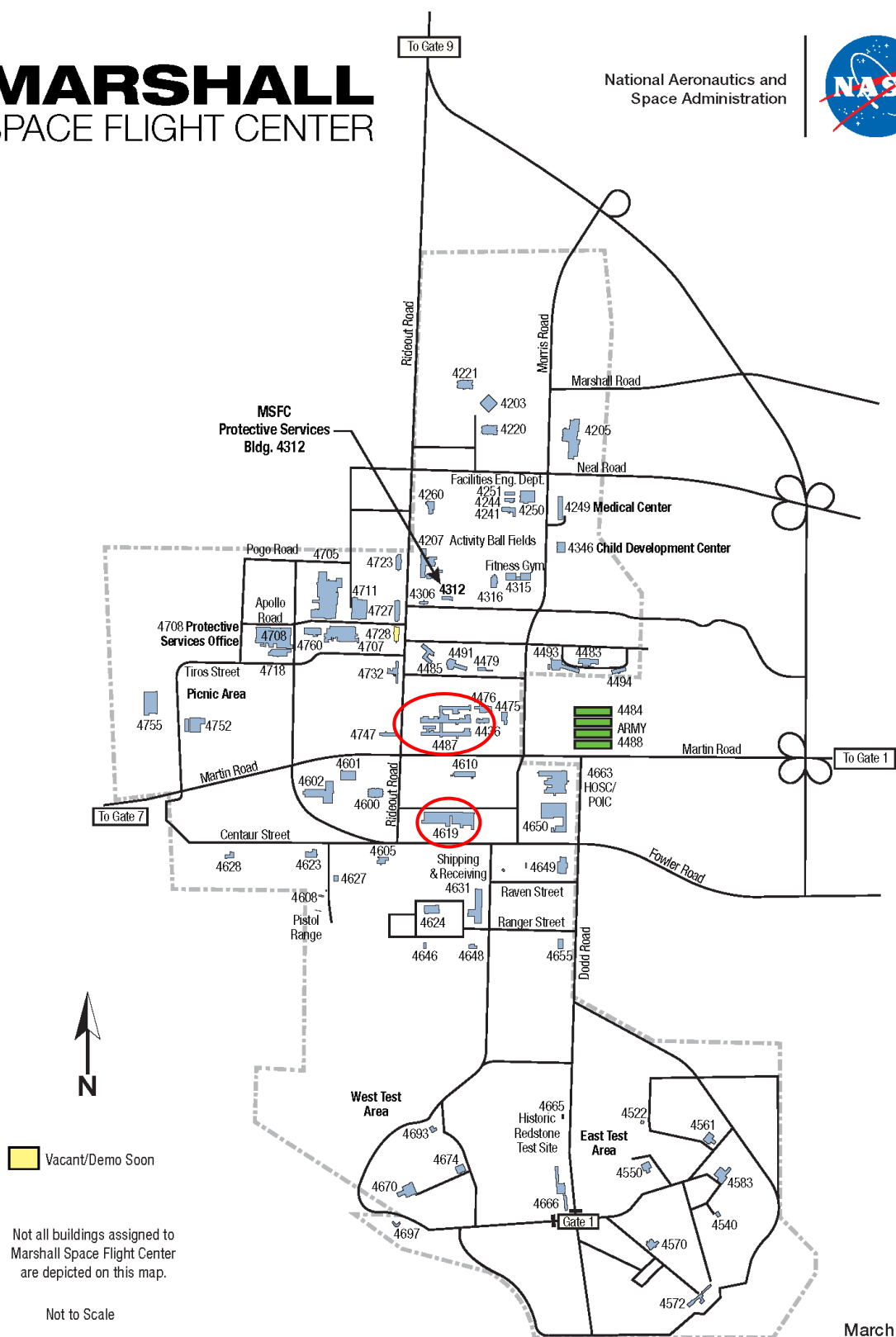
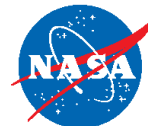
# MSFC RADIOACTIVE MATERIALS LICENSE AMENDMENT



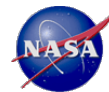
## ATTACHMENT 1 (cont'd)

# MARSHALL SPACE FLIGHT CENTER

National Aeronautics and  
Space Administration



March 2023



**ATTACHMENT 1 (cont'd)**

**Figure 1. Location of Buildings 4619 at Marshall Space Flight Center**

**Table 1. Summary of licensed radioactive sources that will or may be used at Bldg. 4619, Room 155 (West High Bay) and Bldg. 4487, Room BC105.**

Isotope	Building/Room
Am-241/Be	4619/155
Am-241	4619/155 and 4487/BC105
Co-60	4619/155 and 4487/BC105
Cs-137	4619/155 and 4487/BC105