

**WARNING: THIS PROCEDURE
CONTAINS HAZARDOUS OPERATIONS**



HESSI SPACECRAFT SPECTROMETER SOURCE HANDLING

HSI_MIT_037C.DOC

2001-JAN-15

DAVID SMITH

DRAFT

As Run on: _____ (Date/Time)

By _____ (Source Custodian)

DOCUMENT REVISION RECORD

Rev.	Date	Description of Change
A	11/14/00	Initial Version
B	12/12/00	Added emergency procedure.
C	01/15/01	<p>NASA Safety Review Comments</p> <p>Page 3 Item 3 Add: User must notify NASA Safety upon transfer of authorized source on to or off of approved VAFB areas. NASA Safety shall be notified prior to receiving and removal/shipment of source to schedule survey/inspection of the source and storage/use areas approved under KSC Radiation Protection Program Use Authorization K-IR-10313.</p> <p>Page 3 Item 4 Add: All real or suspected over exposures to radioactive contamination must be immediately reported to NASA Safety. HESSI Source Custodian will store the source in a lead pig, locked in RAM Locker/Safe marked with WARNING signs provided in Bldg 836. Custodian and NASA Safety/ARO will have combination to Locker/Safe. NASA Safety/ARO MUST BE present to access source.</p> <p>Page 4 item 5 Insert: A crew briefing shall be made prior to start of hazardous ops.</p> <p>Page 4 item 5 Add/Insert: List or Number of Essential Personnel required to support the hazardous operation.</p> <p>Page 4 item 5 Add: Task leader verify all tools and equipment needed to perform task is on hand. All personnel involved in test are trained, briefed, and ready to proceed.</p> <p>Page 4 item 5 Add: Establish Bldg 836 LAB1 as the Safety Control area. Clear all nonessential personnel from LAB1.</p> <p>Page 4 item 5 Insert: Turn on flashing amber light. Make announcement to clear safety control area.</p> <p>Page 4 item 5 Insert: In bldg 836, obtain NASA Safety concurrence to proceed with HAZARDOUS operations.</p> <p>Page 4 Item 5 Add: After completion of hazardous operation (in bldg 836) obtain NASA Safety concurrence to return area to normal operations, turn amber light off.</p> <p>Page 4 Add: EMERGENCY Instructions. All real or suspected over exposures to radioactive contamination and/or radiation must be immediately reported to NASA Safety (also power down, etc.)</p>

Western Range/NASA Safety: _____ Date _____

Project Manager: _____ Date _____
 Peter Harvey

System Engineer: _____ Date _____
 David Curtis

QA: _____ Date _____
 Ron Jackson

1.0 INTRODUCTION

The following procedure provides the necessary instructions for safe use and storage of the Spectrometer calibration source. The source is 100 microCuries of ¹³³Ba. The document describes the equipment, personnel, and steps necessary to safely use the source.

2.0 APPLICATION

The HESSI payload will be transported to VAFB with the Germanium detectors at operational temperatures. This will allow for the proper test and final calibration prior to flight while the spacecraft is in building 836. The source will not be used in 1555.

3.0 SOURCE INFORMATION

The source characteristics are as follows:

Dose at 1 meter measured at U.C.B.:	0.07 mrem/hr
Dose at 1 meter in lead pig:	< 0.01 mrem/hr

Other source characteristics (activity, encapsulation, etc.): see Certificate of Calibration from manufacturer.

Testing history: Leak tested by manufacturer: wiped over entire surface with moistened paper disk. Paper picked up < 0.001 uCi betas/gammas, < 0.0001 uCi alphas.

Sources will be leak tested again by U.C. radiation office just before transport to VAFB.

User must notify NASA Safety upon transfer of authorized source on to or off of approved VAFB areas. NASA Safety shall be notified prior to receiving and removal/shipment of source to schedule survey/inspection of the source and storage/use areas approved under KSC Radiation Protection Program Use Authorization K-IR-10313.

4.0 PERSONNEL

Only the Project Manager, System Engineer or Quality Assurance have the authority to make changes in this procedure if the need arises.

David Smith is the designated Source Custodian (SC) and will be handling the radioactive source in the performance of the detector calibrations.

All real or suspected over exposures to radioactive contamination must be immediately reported to NASA Safety. HESSI Source Custodian will store the source in a lead pig, locked in RAM Locker/Safe marked with WARNING signs provided in Bldg 836. Custodian and NASA Safety/ARO will have combination to Locker/Safe. NASA Safety/ARO MUST BE present to access source.

5.0 SAFETY

The room where the source will be used and the storage area will be posted with warning signs and a copy of the U.C.B. group's Radiation Use Authorization.

Prior to any use of the sources, the Source Custodian will instruct every person who may be in the room during such use in all the necessary precautions to be taken to protect his/herself and others, and to prevent the spread of any radioactive contamination. Female workers will be informed of the NRC Instructions Concerning Prenatal Radiation Exposure.

The Source Custodian will store the source in a lead pig, locked in a tool chest, and marked with warning signs. The Source Custodian will wear a dosimetry ring and disposable gloves when handling the source. The source will be in its storage place at all times while not being immediately handled by the custodian.

5.0 PROCEDURE

- A crew briefing shall be made prior to start of hazardous ops.
- Source Custodian will verify all tools and equipment needed to perform task is on hand. All personnel involved in test are trained, briefed, and ready to proceed.
- The spacecraft and instrument will be turned ON and configured for functional testing using procedure HSI_MIT_018.
- Establish Bldg 836 LAB1-HighBay as the Safety Control area. The essential personnel in that area are a Source Custodian and NASA Safety or designee. Clear all nonessential personnel from LAB1-Highbay. Personnel in LAB1-GSE area will be the Test Conductor, Test Engineer, and Guard.
- In bldg 836, obtain NASA Safety concurrence to proceed with HAZARDOUS operations.
- Turn on flashing amber light. Make announcement to clear safety control area.

BEGINNING OF HAZARDOUS OPERATIONS

WARNING : Performing the procedure below may result in severe personnel injury, loss of life, or major equipment damage if not followed exactly.

- The Source Custodian will remove the source from storage, and affix it to the end of a rod with which he can put the source close to the HESSI detectors without touching it directly.
- When this fixture is ready, the Source Custodian will signal the spacecraft operator to begin recording data, then hold the source in a position or positions necessary to stimulate the detector(s) being examined.
- When the Source Custodian judges enough data have been accumulated, he will signal the operator to stop recording, then return the source to storage.
- The recorded data can then be played back into the GSE software for examination.

END OF HAZARDOUS OPERATION

- After completion of hazardous operation (in bldg 836) obtain NASA Safety concurrence to return area to normal operations,
- Make a facility announcement and turn amber light off
- The spacecraft and instrument will be turned OFF if no further testing is planned.

EMERGENCY PROCEDURES

All real or suspected over exposures to radioactive contamination and/or radiation must be immediately reported to NASA Safety. Doug Newsome, the NASA Safety Manager at NASA/KSC VLS Resident Office, can be reached at (805) 605-3320.

If any incident occurs that could cause the unplanned release of radioactive materials or otherwise compromises the agreed upon use and safety, then the procedure is to:

- Call 911
- Call Doug Newsome, NASA Safety Manager at NASA/KSC VLS Resident Office at (805) 605-3320.
- Call Western Range Radiation Safety Officer, Michelle Laufer, 805-605-7246.