Applicability: This RSP specifies radiological practices that apply to all work performed in MaCS. This RSP specifies technical requirements for implementation of information provided in the CAES Radiological Primer and Lab Orientation.

All MaCS workers are required to read this RSP before their MaCS walk-thru is conducted. The RSP is available on the CAES Training Access Management System ([TAMS](https://inlportal.inl.gov/portal/server.pt/community/caes_home/281/tams)).

**MaCS Laboratory Designation:** The MaCS is comprised of five separate rooms and a common area (i.e., hallways). All of MaCS is classified as a radiologically controlled area. As a best practice, all people working in MaCS are required to wear a dosimeter. MaCS hallways are radiologically controlled areas and shall not be used for performing sustaining radiological work. They may be used for short-term receipt, removal, and movement of radiological materials.

Each MaCS room is classified as a radiologically restricted area when rad materials are in use. To establish an inner room as a radiologically restricted area (i.e., commence rad work) the following steps are taken:

Obtain approval from Lab Lead or CSO

 Post a radiation restricted area sign on all access doors to the laboratory

A room shall only be declassified as radiologically restricted by the CAES Safety Officer (CSO) after they have completed and documented surveying and contamination checks on the room and equipment within. A room shall only be declassified after a survey of the area and equipment has verified it is “clean.” Clean is defined as 70 dpm/100cm2 (total or gross counts-background counts).

Radiologically Restricted Signage on MaCS rooms may only be removed by the CSO, Lab Lead or designees.

***NOTE:*** *All postings and signage will be adhered to. Signage and postings will be subject to change and it is each lab user and worker’s responsibility to check the current status of the MaCS Lab and each room prior to making an entry.*

**MaCS Signage and Access: Outer door and MaCS/Materials Inner Door:** These two doors are always consistently marked to reflect the status of MaCS. The two options are:

“Radiologically controlled area” signage: Indicating all people with unescorted access rights may enter the lab; escorted access is allowed.

“Temporarily No Entry by All Personnel– Radiation Materials In Use” signage: Serves as an administrative control indicating that personnel, even those with approved unescorted access, shall not enter MaCS unless approved by the CSO or Lab Lead. The signage indicates activities are underway that involve movement or short-term use of radioactive materials in the hallway; limiting access is established as a sound ALARA practice.

 **Inner room Doors:**

No signage:Meaning the room may be accessed by all personnel.

“Approved Access Only- Radiation Materials in Use” signage: Serves as an administrative control indicating that only personnel approved by the CSO or Lab Lead for the activity in progress may enter the room. Other personnel approved as unescorted radiation workers shall not enter the room.

Material, Receipt, Removal and Accountability:

Material receipt and removal: May only be performed by CAES CSO or designees in accordance with [RSP-004 CAES Protocol for Delivery, Movement or Removal of Radiological Materials from CAES](https://inlportal.inl.gov/portal/server.pt/document/84206/rsp-004_movement_or_removal_rad_materials_docx).

Material Accountability:

Material Tracking Logbook: Serves as a tool for maintaining material accountability. An entry is required in the logbook when a person takes possession of rad materials or moves the materials to a different location. Movement of rad materials within MaCS is defined as any movement of materials between the hallway (e.g., rad safe) and a room or between two rooms. All rad material movement requires the following:

* Prior approval of the Lab Lead or CSO
* Entry of the action in the Material Tracking Logbook
* Handling and PPE as specified by the CSO for the activity

**Movement of materials between Materials and MaCS labs:** *Because a significant portion of the Advanced Materials and MaCS radiological work involves the same materials that are processed in different stages of a single process, one inventory is maintained for these two labs. Therefore, movement of materials between the two labs using the inner door between these two labs only requires a note in the materials tracking logbook and not a change in the lab inventory database.*

Training and Personnel Protection:

**General Access Training:** Because dosimeters are required for all personnel who access MaCS, all unescorted access personnel must complete online [ISU Radiation Safety Training](http://www.physics.isu.edu/health-physics/tso/rad_training/intro.html).

**Instrument Qualification:** Instrument Leads administers a checklist and documents process using CAES -054, CAES Researcher Controlled Activity. Only people who have completed this qualification process are authorized to operate instruments independently.

PPE Requirements: Practices that govern handling of rad samples and materials include:

Good ALARA practices should be conducted at all times when working with radiological samples. When possible, personnel should not come in direct contact with the radiological samples, when reasonable samples should be handled by using tweezers or a similar tool. In addition, whenever possible pre-stage tools, and set up your work area prior to introducing radiological samples to the area.

***NOTE:*** *Internal contamination occurs when unprotected personnel ingest, inhale or have wounds (open cuts, scratches etc.) that become contaminated with radioactive material. Be sure to cover all open wounds prior to entering any radiologically controlled areas or handling radiological materials.*

The basic protocol for handling samples and when to don and doff gloves is as follows:

* Don first pair of gloves.
* Don lab coat.
* Tape first pair of gloves to lab coat.
* Don dosimeter: Whole body dosimeters are required for all personnel working in MaCS.
* Don second or outer pair of gloves.

***NOTE:*** *Whenever there is suspect contamination, change outer gloves.*

* Use designated carts and lead bricks for handling and moving samples.
* Perform minor sample preparation and loading samples on studs on designated trays with tray liners.
* Conduct swipe tests and survey on all areas of possible contamination (e.g. the bottom of sample specimen stubs). Document all swipes in the Logbook.
* Place sample in instrument.
* Conduct swipe tests and survey on all areas of possible contamination. (e.g. outside the instrument where the tray was placed, around sample holder, tray etc.) Document all swipes in the Logbook.
* Remove tape and outer pair of gloves and place them in radiological waste container.
* Remove inner pair of gloves and place them in radiological waste container.
* Frisk hands, feet, and lab coat using an alpha or/and beta/gamma frisker.

Note: If lab coat frisks “clean,” hang on coat rack when sample prep and loading of sample is completed. If lab coat contains contamination dispose of in it in the radiological waste container and immediately notify the lab lead, CSO and others working in the lab area and await further instruction from CSO or CSO alternate designee.

**NOTE:** *Remember to operate instrument, computer, etc. without gloves and only place trays on/in designated locations.*

 Survey and Contamination Requirements

**Exit through MaCS outer door to hall:** All personnel are required to frisk in designated area when exiting MaCS.

**Exit through door to Materials Lab:** All personnel are required to frisk in designated area when exiting MaCS.

If contamination is discovered stop and ask for assistance from other members in the lab. Have them notify CSO, Lab Lead, or alternate designee. Do not move unless your safety is compromised. Decontaminate area (remove and dispose of contaminated clothing and/or clean areas of contamination with wet wipes and re-frisk).

***NOTE:*** *Garbage should not be set out in the hallway for disposal by anyone other than the TSO.*

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