If you are using a printed copy of this procedure, and not the on-screen version, then you MUST make sure the dates at the bottom of the printed copy and the on-screen version match.
The on-screen version of the Collider-Accelerator Department Procedure is the Official Version.
Hard copies of all signed, official, C-A Operating Procedures are kept on file in the C-A ESHQ Training Office, Bldg. 911A

C-A OPERATIONS PROCEDURES MANUAL

3.25 Emergency Procedure for Building 958, NASA Space Radiation Laboratory

Attachments

Text Pages 2 through 4

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials

Approved: _____***Signature on File***_____ _____
Collider-Accelerator Department Chairman Date

P. Cirnigliaro

3.25 Emergency Procedure for the NASA Space Radiation Laboratory

1. Purpose

The purpose of this document is to define the Local Emergency Plan (LEP) for the operation of the NASA Space Radiation Laboratory (NSRL), located in building 958. This local emergency plan will help to ensure:

- The safety of personnel
- Implementation of the appropriate emergency procedures contained in C-A-OPM 3.0 and Section 5 of this document
- Prompt notification of appropriate personnel
- Maintenance of appropriate Collider-Accelerator emergency status
- Protection of the environment
- Preservation of BNL facilities and equipment
- Care and safety of animals used in scientific research at the NSRL

2. Responsibilities

2.1 Local Emergency Coordinator (LEC) - During the testing, commissioning, and operation of the NSRL, the Local Emergency Coordinator (LEC) will be the C-A Collider-Accelerator Support (CAS) Watch. The responsibilities of the LEC are described in C-A-OPM 3.2.

2.1.1 The LEC is responsible for being aware of the Medical and/or Biology Department's Responsible Person.

2.2 The Medical and/or Biology Department's Responsible Person responsibilities shall include:

2.2.1 Acting as First Responder to incidents and responding to the Command Post.

2.2.2 Assisting in maintaining the NSRL facility in a safe condition.

2.2.3 Implementing all emergency responses outlined in the Procedures section of this document, or any additional instructions given by the Department Emergency Coordinator (DEC).

2.3 Medical and Biological Experiment Liaisons, and the C-A Department Liaison Physicist shall:

2.3.1 Ensure that personnel involved in NSRL operations are trained in all emergency and safety procedures.

2.3.2 Ensure that all postings of special instructions are complete.

2.4 The Medical Experiment Liaison responsibilities shall include:

2.4.1 Ensuring the care, handling, and health of animals used for scientific research at the NSRL.

3. Prerequisites

The NSRL, Medical, and/or Biology Department's Responsible Person shall have training in the following:

3.1 "Local Emergency Plan", C-A-OPM 3.0.

3.2 All relevant equipment involved in the NSRL to ensure safe operations.

3.3 Knowledge of the physical layout of the NSRL experimental area (routes of egress, location of emergency equipment, telephones, controls, etc.).

3.4 Knowledge of the assembly areas:

3.4.1 Outside Assembly Area – parking lot
3.4.2 Indoor Assembly Area – Lobby of building 930

4. Precautions

The safety of personnel, experimental subjects, and the environment is of primary importance. In an emergency, all personnel shall take great care not to give instructions or information, which may place personnel, experimental subjects, or the environment at risk or harm.

5. Procedures

5.1 In the event of an emergency at NSRL (such as a fire, or notification of such by the CAS watch) individuals shall:

5.1.1 Pull the nearest fire alarm box if the alarm is not already sounding, then call 2222 or 911.

5.1.2 Evacuate all personnel, proceed to the outside assembly area, and await the arrival of the Fire/Rescue Group.

5.1.3 If it is possible, and reasonable to be required to maintain the safety and health of the research animals, and without putting personnel or property at risk, Medical Department will remove research animals from the NSRL Laboratory to the outdoor assembly area for transport back to the Medical Department.

5.1.4 If the emergency occurs during Collider-Accelerator operations periods, notify the Operations Coordinator (OC) at 4662 as soon as possible.

5.1.5 The LEC and Medical and/or Biology Department Responsible Person shall report to the Command Post upon arrival of the Fire/Rescue Captain. The Command Post is red vehicle designated Car-1, unless directed elsewhere by the F/R Captain.

5.2 If an unscheduled protest, notice of protest, or an animal activist threat occurs, the Security Office should be notified immediately at extension 2222 or 911. They will determine what action should be taken.

6. Documentation

None

7. References

7.1 C-A-OPM 3.0, "Local Emergency Plan".

8. Attachments

8.1 Layout of the NSRL

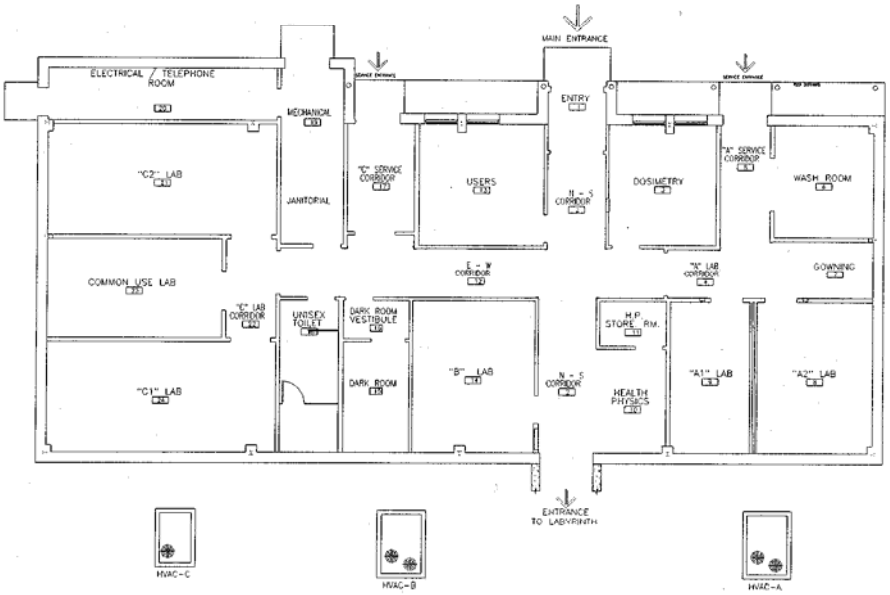
8.2 BNL Exposure Control Plan

Attachment 8.1

Layout of the NSRL

N

OUTDOORS ASSEMBLY AREA



BUILDING 958 NASA SPACE RADIATION LABORATORY

Attachment 8.2

Brookhaven National Laboratory

Exposure Control Plan

Organization:	**Biology, Medical, NSRL** **Tissue Culture Areas in Biology, Medical, NSRL**
Operation:	**Tissue Culture as part of NSRL User Program** We have identified the following types of "biological" samples brought to the NSRL: 1. Human Blood -- covered by the Bloodborne pathogen standard. 2. Animal Blood and cells- any animal blood is serology tested by vet services and not pathogenic. Animal cells are non pathogenic. (IATA and DOT do not consider these infectious). No user brings infected animals or cell lines to BNL. 3. Human cells- primary cell lines. These are cells that come directly from humans without any or very little screening or passes and are covered by bloodborne standard. 4. Human cell lines-established. These are purchased from a cell culture company and are screened. They come with a biosafety rating of 1 (non pathogenic). (exempt from IATA and DOT as well--considered biological specimens). The animal blood and cells and established human cell lines (which are the most widely used by the NSRL population) do not represent a biosafety hazard. These users are not required to follow this plan however they should be aware of requirements on attached table.

1.	**Exposure Determination** (to be made without regard to the use of personal protective equipment):
1.a	List job classifications in which *all* employees in those job classifications have occupational exposure: NSRL Users who irradiate primary human cell cultures, human blood, or human body fluids and BNL staff who support tissue culture users (including glasswashing support).
1.b	List job classifications in which *some* employees have occupational exposure: ▪ No access to areas by untrained personnel (custodial, etc). ▪ Glasswashing support could have limited potential for exposure (however workers will rinse glassware with sodium hypochlorite prior to handling by glasswasher and all racks from incubators are wiped down prior to handling by glasswasher). ▪ Facility Support technicians who support operations in tissue culture areas at NSRL, Bio, Med (where surveys are required).
1.c	List tasks and procedures or groups of closely related tasks and procedures in which occupational exposure occurs: Manipulation of tissue and cells, glasswashing, surveying tissue culture areas for rad contamination.
2.	Describe the method of implementation (check all that are applicable):
2.a	__x_ **Universal Precautions**
2.b	**Engineering and Work Practice Controls** __x_Engineering controls are examined, maintained, and/or replaced on a regular schedule to ensure their effectiveness. State control and frequency:

	Yearly certification of biosafety cabinets, single pass air, limited access facility. __x_Hand-washing facilities accessible to employees. Location is: all labs and tissue culture rooms are equipped with sinks (and eyewashes) __N/A _Hand-washing substitute provided for employees. Method is: We use hand sanitizers in many areas.N/A __X_Employees required to wash their hands immediately or as soon as feasible after: ▪ Removal of gloves or other personal protective equipment. ▪ Contact of such body areas with blood or other potentially infectious materials. _x__Flush mucous membranes with water immediately or as soon as feasible after contact with blood or other potentially infectious materials. There are eyewash stations on sinks. _N/A__Contaminated needles and other contaminated sharps are not bent, recapped, or removed (unless no alternative is feasible and the action is required by a specific medical or dental procedure). We require most clinic labs to use safety needles when possible. No sharps are used. __N/A_Sharing or breaking of contaminated needles is prohibited. _X__Immediately or as soon as possible after use, contaminated reusable sharps are placed in appropriate containers until properly reprocessed. _x__Waste containers are puncture resistant, labeled with the Biohazard Label, RED in color, and leak-proof on the sides and bottom. Disposed of as Regulated Medical Waste __x_Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses in work areas is prohibited. __x_Food and drink are not kept in refrigerators, freezers, shelves, cabinets, or on countertops or bench tops where blood or other potentially infectious materials are present. _x__All procedures involving blood or other potentially infectious materials are done in a manner to minimize splashing, spraying, spattering, and generation of droplets of these substances. __x_Mouth pipeting of blood or other potentially infectious materials is prohibited. _x__Specimens of blood or other potentially infectious materials are placed in a container that prevents leakage during collection, handling, processing, storage, transport, or shipping. Label the container with the Biohazard Label. _x__Equipment that may have become contaminated with blood or other potentially infectious materials is examined prior to servicing or shipping and decontaminated as necessary. Servicing representative and/or the manufacturer are given information prior to handling, servicing, or shipping so that appropriate precautions will be taken.
2.b	**Engineering and Work Practice Controls** __x_Engineering controls are examined, maintained, and/or replaced on a regular schedule to ensure their effectiveness. State control and frequency:

	Yearly certification of biosafety cabinets, single pass air, limited access facility. __x_Hand-washing facilities accessible to employees. Location is: all labs and tissue culture rooms are equipped with sinks (and eyewashes) __N/A _Hand-washing substitute provided for employees. Method is: We use hand sanitizers in many areas.N/A __X_Employees required to wash their hands immediately or as soon as feasible after: ▪ Removal of gloves or other personal protective equipment. ▪ Contact of such body areas with blood or other potentially infectious materials. _x__Flush mucous membranes with water immediately or as soon as feasible after contact with blood or other potentially infectious materials. There are eyewash stations on sinks. _N/A__Contaminated needles and other contaminated sharps are not bent, recapped, or removed (unless no alternative is feasible and the action is required by a specific medical or dental procedure). We require most clinic labs to use safety needles when possible. No sharps are used. __N/A_Sharing or breaking of contaminated needles is prohibited. _X__Immediately or as soon as possible after use, contaminated reusable sharps are placed in appropriate containers until properly reprocessed. _x__Waste containers are puncture resistant, labeled with the Biohazard Label, RED in color, and leak-proof on the sides and bottom. __x_Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses in work areas is prohibited. __x_Food and drink are not kept in refrigerators, freezers, shelves, cabinets, or on countertops or bench tops where blood or other potentially infectious materials are present. _x__All procedures involving blood or other potentially infectious materials are done in a manner to minimize splashing, spraying, spattering, and generation of droplets of these substances. __x_Mouth pipeting of blood or other potentially infectious materials is prohibited. _x__Specimens of blood or other potentially infectious materials are placed in a container that prevents leakage during collection, handling, processing, storage, transport, or shipping. Label the container with the Biohazard Label. _x__Equipment that may have become contaminated with blood or other potentially infectious materials is examined prior to servicing or shipping and decontaminated as necessary. Servicing representative and/or the manufacturer are given information prior to handling, servicing, or shipping so that appropriate precautions will be taken.
2.c	**Personal Protective Equipment** N/A___CPR (mouthpieces, resuscitation bags, pocket masks, or other ventilation devices) Describe use:

	_X__PPE is cleaned, laundered, and disposed of at no cost to the employee. Consists of disposable gloves, safety glasses. All are disposable or can be cleaned by employee/user. _N/A__PPE is repaired or personal protective equipment is replaced as needed to maintain its effectiveness, at no cost to the employee. Describe recent experience of repair/ replacement: _N/A__Garment(s) penetrated by blood or other potentially infectious materials are removed immediately or as soon as feasible. Describe any events that occurred: __x_All personal protective equipment is removed prior to leaving the work area. It is placed in an appropriately designated area or container for storage, washing, decontamination, or disposal. Container description & location: Gloves removed and disposed of as RMW, hands washed, safety glasses remain on. _x__Gloves are worn: ▪ When it can be reasonably anticipated that the employee may have hand contact with blood, other potentially infectious materials, mucous membranes, and non-intact skin ▪ When performing vascular access procedures ▪ When handling or touching contaminated items or surfaces _x__Disposable (single-use) gloves (such as surgical or examination gloves) are replaced as soon as practical when contaminated or as soon as feasible if they are torn, punctured, or when their ability to function as a barrier is compromised. Describe equipment and exposure scenario: Standard tissue culture—using culture plates, pipettors, etc. If gloves are contaminated they are immediately changed. __Utility gloves are decontaminated for re-use if the integrity of the glove is not compromised. However, they must be discarded if they are cracked, peeling, torn, punctured, or exhibit other signs of deterioration or when their ability to function as a barrier is compromised. Method for decontamination: _N/A__Masks in combination with eye protection devices (such as goggles or glasses with solid side shields or chin-length face shields) are worn when splashes, spray, spatter, or droplets of blood or other potentially infectious materials may be generated and eye, nose, or mouth contamination can be reasonably anticipated. Describe equipment and exposure scenario: _N/A__Gowns, aprons, lab coats, clinic jackets, or similar outer garments are worn in occupational exposure situations. The type and characteristics will depend upon the task and degree of exposure anticipated. Wear surgical caps or hoods and/or shoe covers or boots in instances when gross contamination can reasonably be anticipated. Describe equipment and exposure scenario: We wear lab coats
3.	Describe the procedure for the evaluating **exposure incidents**:
3.a	Are employees included in the BNL vaccination program? Yes. They are on the Bloodborne Pathogen Protocol at OMC.
3.b	Describe Post-Exposure Evaluation/Follow-up process done by the organization or PI: Injury/Illness reporting program. Will go over to the OMC immediately following an exposure and follow existing procedures in SBMS.

4.	Substitution of Less Hazardous Procedures
4.a	Have new or modified tasks and procedures been developed by commercial or internal sources which affect occupational exposure? ___Yes _x__ If Yes, explain: We expect most laboratory people to use safety device needles.
4.b	Have new or modified tasks and procedures changed the employee job types with occupational exposure potential? Yes
4.c	Have you considered and implemented commercially available and effective medical devices of safer design that eliminate or minimize occupational exposure? YES

Decontamination Protocol for Centrifuges and Shakers

After donning the proper PPE:

- Check and clean or replace the rubber cushions in the centrifuge cups as necessary.
- Check all tubes for cracks prior to use.
- Balance tubes prior to centrifuging.
- Use a brake to stop rotating head; never stop the rotating head with your hand.
- Keep lid to the centrifuge closed while machine is being used.
- Blood should be spun in centrifuges containing blood spattering shields.
- Do not open centrifuge until completely stopped when centrifuging blood specimens.
- Use stoppered tubes when centrifuging blood specimens.
- Specimens spun in angle head centrifuges must never be filled to the extent that liquid will be in contact with the tube lips.
- Each person who uses the centrifuge is responsible for the condition of it at the end of the procedure.

NOTICE TO USERS OF POTENTIALLY INFECTIOUS MATERIALS

Potentially infectious material includes the following:

- Human blood, human blood components, products made from human blood, and other human body fluids (e.g., semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, or saliva in dental procedures);

- Unfixed tissue or organ (other than intact skin) from a human (living or dead), HIV-containing cell or tissue cultures, or organ cultures;

- HIV- or HBV-containing culture medium or other solutions, and blood, organs, or other tissues from experimental animals infected with HIV or HBV (including primate blood).

Training :

All Users who work with potentially infectious materials will be responsible for completing the BNL Bloodborne Pathogen Course and the Regulated Medical Waste Generator course.

Precautions for Research Laboratories

The following precautions are recommended for workers in laboratories.

1. All potentially infectious material should be transported in a manner that will prevent leaking during transport. Care should be taken when collecting each specimen to avoid contaminating the outside of the container and of the laboratory form accompanying each specimen, and to clean the container or to place it in a secondary container. When transporting specimens in buckets, secondary containers shall be used. When transporting specimens between buildings a laboratory designated vehicle shall be used.
2. All persons processing potentially infectious material specimens (e.g., removing tops from vacuum tubes) must wear gloves. Masks and protective eyewear shall be worn if mucous membrane contact with blood or body fluids is anticipated. Gloves shall be changed and hands washed after completion of specimen processing.
3. For routine procedures such as histologic and pathologic studies a biological safety cabinet is not necessary. However, biological safety cabinets (Class I or II) should be used whenever procedures are conducted that have a high potential for generating droplets. These include activities such as blending, sonicating and vigorous mixing.
4. Mechanical pipetting devices **MUST** be used for manipulating all liquids in the laboratory. **MOUTH PIPETTING SHALL NOT BE DONE FOR ANY PROCEDURE IN THE LABORATORY**.
5. Use of needles and syringes should be limited to situations in which there is no alternative, and the recommendation for preventing injuries with needles outlined above should be followed.
6. Laboratory work surfaces should be decontaminated with a 1:10 bleach solution after a spill of potentially infectious material and when work activities are completed.
7. Contaminated materials used in laboratory tests should be decontaminated before reprocessing, or be placed in bags and disposed of in accordance with the Regulated Medical Waste Subject Area). Liquid biological waste can be treated with 1:10 bleach solution and disposed of in the sanitary system. ALL SOLID WASTE IS TO BE BROUGHT BACK TO THE MEDICAL DEPARTMENT
8. Scientific equipment that has been contaminated with potentially infectious material shall be decontaminated and cleaned.
9. All persons should remove protective clothing before leaving the laboratory and wash their hands after completing laboratory activities.

Labels and Signs

Biohazard signs, which are fluorescent orange or red-orange, shall be affixed to all containers and storage areas where potentially infectious materials are used and/or stored. Red bags or red containers may be substituted for labels.

Cleaning and Decontaminating Spills of potentially infectious material

All equipment and environmental and working surfaces shall be cleaned and decontaminated after contact with potentially infectious materials. Work surfaces shall be decontaminated with an appropriate disinfectant, such as a 1:10 household bleach solution after completion of procedures, as soon as feasible after any spill of blood or other potentially infectious materials.

Small spills (for example one or two drops) can be decontaminated by wiping them up with gauze soaked with 1:10 bleach. Large blood spills should be flooded with a liquid germicide solution.

Questions about potentially infectious materials, protocols or procedures please contact Ann Emrick at telephone 631 344-5756, email emrick@bnl.gov.

Summary of Handling Requirements for Tissue Culture Users

	Classification	Practices	Decontamination/Disposal	Transportation
Animal blood and Animal Cells (non-infectious as per blood tests)	BSL-1 Not known to cause disease in healthy humans	**Standard Microbiological Practices, universal precautions, including:** • **Gloves, eye protection** • **Wash hands after handling** • **Minimize aerosols** • **Limit access to lab** • **No eating, drinking**	• **All surfaces and equipment wiped down with 10% sodium hypochlorite upon completion of experiment and after any spill.** • **All liquid wastes treated with 10% sodium hypochlorite prior to release to sanitary.** • **All solid wastes disposed of as regulated medical waste.** • **All re-usable glassware rinsed with 10% sodium hypochlorite prior to glasswashing**	On-Site: • **Secondary containment** Off-Site: • **Documentation that the material is non-infectious. Contact B. Colichio**
Human Cells- established cell lines (IRB exempt, screened)	BSL-1 Not known to cause disease in healthy humans	Standard Microbiological Practices, universal precautions, including: • **Gloves, eye protection** • **Wash hands after handling** • **Minimize aerosols** • **Limit access to lab** • **No eating, drinking**	• **All surfaces and equipment wiped down with 10% sodium hypochlorite upon completion of experiment and after any spill.** • **All liquid wastes treated with 10% sodium hypochlorite prior to release to sanitary.** • **All solid wastes disposed of as regulated medical waste.** • **All re-usable glassware rinsed with 10% sodium hypochlorite prior to glasswashing.**	On-Site: • **Secondary containment** Off-Site: • **Documentation that the material is non-infectious. Contact B. Colichio**
Human Cells- primary (IRB exempt)	BSL-2 Associated with human disease. Regulated by OSHA Bloodborne Pathogen Standard	Standard Microbiological practices, universal precautions (above), plus: • **Limited Access** • **Biohazard Warning Sign** • **Biosafety Cabinet** • **Sharps Precautions**	• **All surfaces and equipment wiped down with 10% sodium hypochlorite upon completion of experiment and after any spill.** • **All liquid wastes treated with 10% sodium hypochlorite prior to release to sanitary.** • **All solid wastes disposed of as regulated medical waste.** • **All re-usable glassware rinsed with 10% sodium hypochlorite prior to glasswashing/autoclaving.**	On-Site: • **Government vehicle,** • **biohazard sticker,** • **secondary containment.** Off-Site: **1. Shipped as infectious material. Contact Bob Colichio.**
Human Blood (May or may not be IRB exempt)	BSL-2 Associated with human disease. Regulated by OSHA Bloodborne Pathogen Standard	Standard Microbiological practices, universal precautions (above), plus: • **Limited Access** • **Biohazard Warning Sign** • **Biosafety cabinet** • **Sharps Precautions**	• **All surfaces and equipment wiped down with 10% sodium hypochlorite upon completion of experiment and after any spill.** • **All liquid wastes treated with 10% sodium hypochlorite prior to release to sanitary.** • **All solid wastes disposed of as regulated medical waste** • **All re-usable glassware rinsed with 10% sodium hypochlorite prior to glasswashing.**	On-Site: • **Government vehicle,** • **biohazard sticker,** • **secondary containment.** Off-Site: • **Shipped as infectious material. Contact Bob Colichio.**