

# Notice to All Personnel

*Be Safe and We're All Safe!*

*Be Safe or Die*

## **SAFETY AND ACCIDENT PREVENTION AT THE PSFC**

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### **Introduction**

This document includes basic information about the safety program and policies of the Plasma Science and Fusion Center (PSFC) and of the Institute. It is designed as a brief overview of some of the many programs which are in place at the PSFC. Please seek more specific information from the ES&H Office on the second floor of NW21 if you have any questions or concerns regarding safe work practices.

### **PSFC Safety Policy**

Consistent with MIT's policies and procedures, the Plasma Science and Fusion Center (PSFC) is committed to the maintenance of a safe working and learning environment. All personnel are responsible for doing their part to ensure the safety of themselves, students, and their coworkers. Work is to be done in accordance with federal, state, and local regulation.

All PSFC personnel must be briefed regarding safety requirements and practices related to the laboratory, shop, or office area in which they will be working by their supervisor or EHS Rep. before they start work or are allowed unescorted access to the site. For assistance, see Nancy Masley, NW21-215 to obtain a Safety Briefing form and EH&S Compliance Form, as well as other supporting safety documentation.

Faculty, administration, and research supervisory personnel are responsible for promoting safe practices and for providing safe equipment and facilities for members of the staff, students, and visitors. Each person using the equipment and facilities of the Institute is expected to follow proper and safe procedures, to report accidents promptly, and to bring to the attention of the EHS Coordinator, supervisors and faculty members any unsafe conditions or practices. Safety in the laboratory can be achieved only by the exercise of good judgment and proper use of facilities by informed, responsible individuals. Anyone who carries on the Institute's business is responsible for doing so in a reasonable and non-negligent manner.

### **[ES&H Office](#) and [Safety Committee](#)**

In order to more effectively oversee the safety of PSFC personnel, the PSFC Office of Environment, Safety and Health (ES&H) was created, which is located on the second floor of NW21 (NW21-203, 214 & 215). It is overseen by Matt Fulton, Facilities & Operations Administrator (NW21-203) and Karen Cote, EHS Coordinator (NW21-214). Both have full authorization to act on behalf of the Director in the interest of the safety of PSFC personnel and equipment.

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Matt manages PSFC facilities, security, operations, space planning as well as building repair and maintenance for the Center. He also oversees space changes and construction projects. In addition, he works with Karen administering the safety program as well as co-chairs safety committee.

Karen's duties include administrating and coordinating all PSFC safety training, meetings, inspection tours, chemical purchases and inventories, and assisting with the promulgation of safety procedures and documents. She also acts as Emergency Preparedness Plan Coordinator.

Nancy Masley, Administrative Assistant. Nancy's duties include administrative support for all ES&H Office activities, as well as administrative support for Operations, Planning, and Facilities. She also maintains the safety briefing files and updates the safety training records in the MIT central database. Nancy programs MIT ID cards for access to PSFC buildings and issues keys.

Bill Byford is a licensed electrician and oversees the Electrical Safety Program and the welding permit program. He also performs safety briefings for the Alcatraz Group.

Support for the PSFC safety program is provided by the MIT Environmental Health and Safety Office. Fred McWilliams and Matt Carey from the Radiation Safety Office are the lead contacts for the PSFC and act as liaisons to the MIT EH&S office. Jim Doughty from the Industrial Hygiene Office, Phyllis Carter from the Environmental Management Program, Damon Baptista from the Bio-Safety Office and Andy Kalil (interim contact) from the Workplace Safety Program are available to provide specialized advice in their areas of expertise.

The ES&H Office has assembled a large amount of written materials concerning state, local, federal, and DOE health and safety regulation. Materials relating to generally accepted safe work practices as well as MIT's policies are also maintained. We encourage you to make use of this collection of information by navigating to <https://ehs.mit.edu/site/> or calling x3-9839.

### PSFC SAFETY COMMITTEE MEMBERS

<b>Name/Title</b>	<b>Group Affiliation</b>	<b>Phone</b>	<b>Room</b>	<b>Email</b>
Dave Arsenault <i>Project Technician</i>	MFE Project PSFC	617-253-8616	NW21-119	<a href="mailto:arsenault@psfc.mit.edu">arsenault@psfc.mit.edu</a>
Damon Baptista <i>Asst. Biosafety Officer</i>	Biosafety Office MIT EHS Office	617-324-0114	N52-496	<a href="mailto:damonb@mit.edu">damonb@mit.edu</a>
Juan Bascunan <i>Senior Research Staff</i>	Iwasa Group MR/FBML-PSFC	617-253-5497	NW14-3113	<a href="mailto:bascunan@mit.edu">bascunan@mit.edu</a>
Paul Bonoli <i>Senior Research Scientist</i>	Plasma Theory Computation - PSFC	617-253-0992	NW16-240	<a href="mailto:bonoli@psfc.mit.edu">bonoli@psfc.mit.edu</a>
Bill Byford <i>Plant Engineer</i>	MFE Project PSFC	617-253-5982	NW21-109	<a href="mailto:byford@psfc.mit.edu">byford@psfc.mit.edu</a>
Matt Carey <i>Radiation Protection Officer</i>	Radiation Safety MIT EHS Office	617-324-6234	N52-496	<a href="mailto:mgcarey@mit.edu">mgcarey@mit.edu</a>
Phyllis Carter <i>EMP Officer</i>	Environ. Mgmt. MIT EHS Office	617-252-2508	N52-496	<a href="mailto:pcarter@mit.edu">pcarter@mit.edu</a>
Karen Cote <i>EHS Coordinator</i>	Headquarters PSFC	617-253-9839	NW21-214	<a href="mailto:kacote@psfc.mit.edu">kacote@psfc.mit.edu</a>

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Ernie Doeg <i>Research Specialist</i>	Petrasso Group HEDP - PSFC	617-253-3693	NW21-114	<a href="mailto:edoeg@psfc.mit.edu">edoeg@psfc.mit.edu</a>
Gary Dekow <i>Operations Supervisor</i>	MFE Project PSFC	617-253-6177	NW21-107	<a href="mailto:dekow@psfc.mit.edu">dekow@psfc.mit.edu</a>
Jim Doughty <i>Industrial Hygiene Officer</i>	Industrial Hygiene MIT EHS Office	617-258-5636	N52-496	<a href="mailto:jdoughty@mit.edu">jdoughty@mit.edu</a>
Matt Elkins <i>Graduate Student</i>	Hong Group MR/FBML-PSFC	617-258-0214	NW14-2524	<a href="mailto:melk@mit.edu">melk@mit.edu</a>
Matt Fulton <i>Facilities &amp; Ops Administrator</i>	Headquarters PSFC	617-253-8917	NW21-203	<a href="mailto:mfulton@mit.edu">mfulton@mit.edu</a>
Andy Kalil <i>Safety Officer (Interim)</i>	MIT EHS Office Safety Office	617-452-3270	N52-496	<a href="mailto:akalil@mit.edu">akalil@mit.edu</a>
Bill Guss <i>Research Scientist</i>	Magnetic Res. Temkin Grp. - PSFC	617-452-2571	NW16-170	<a href="mailto:guss@psfc.mit.edu">guss@psfc.mit.edu</a>
Tom Hrycaj <i>Administrative Officer</i>	Headquarters PSFC	617-253-4726	NW16-202	<a href="mailto:hrycaj@psfc.mit.edu">hrycaj@psfc.mit.edu</a>
Nancy Masley <i>Administrative Assistant</i>	Headquarters PSFC	617-258-5473	NW21-215	<a href="mailto:nmasley@psfc.mit.edu">nmasley@psfc.mit.edu</a>
Mark Iverson <i>Project Technician</i>	MFE Project PSFC	617-253-0156	NW21-189	<a href="mailto:iverson@psfc.mit.edu">iverson@psfc.mit.edu</a>
Fred McWilliams <i>Radiation Protection Officer</i>	Radiation Safety MIT EHS Office	617-253-5603	N52-457	<a href="mailto:fredmcw@mit.edu">fredmcw@mit.edu</a>
Brian Michael <i>Graduate Student</i>	Griffin Group MR/FBML-PSFC	617-253-8392	NW14-4118	<a href="mailto:bmichael@mit.edu">bmichael@mit.edu</a>
Philip Michael <i>Research Scientist</i>	Minervini Group M&C PSFC	617-253-3186	NW22-137	<a href="mailto:michael@psfc.mit.edu">michael@psfc.mit.edu</a>
Mike Mullins <i>Project Technician</i>	Griffin Group MR/FBML-PSFC	617-253-5416	NW14-5111	<a href="mailto:mulstang@mit.edu">mulstang@mit.edu</a>
Juan Pedro Cascales Sandoval <i>Postdoctoral Fellow</i>	Moodera Group MR/FBML-PSFC	857-829-9804	NW14-3122	<a href="mailto:Jcasc_87@mit.edu">Jcasc_87@mit.edu</a>
Pete Stahle <i>Research Engineer</i>	Ballinger Group NSE-PSFC	617-252-1012	NW22-113	<a href="mailto:pwstahle@mit.edu">pwstahle@mit.edu</a>

NOTE – Committee members with a shaded listing act as EHS Reps for their respective group

Please feel free to contact members of the Committee with your comments and concerns regarding safety at the Plasma Science and Fusion Center.

### EMERGENCY PREPAREDNESS INFORMATION:

**MIT Emergency Number:** From your office telephone, dial 100 In Case Of Fire Or Other Safety/Accident Emergency. If you are calling from your cell phone, call 617-253-1212. It is recommended that you program this number into your cell phone.

**Fire Alarms:** Always assume that a building must be evacuated if the fire alarm is sounding.

**Building Evacuation Instructions:** Each building assigned to the Plasma Science and Fusion Center (NW14, NW15, NW16, NW17, NW20, NW21, and NW22) has floor plans posted near the exits. The location of safety equipment and alarms are clearly indicated on these floor plans,

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which are updated as any changes occur. All employees are instructed to review these plans, and in case of an emergency, assist visitors with the proper egress of the building. All personnel shall immediately vacate the building when the alarm is sounded. Designated emergency assembly areas are located on the opposite side of the street from the effected building. On the North Side the area is the parking lot between NW16 and NW17. On the South Side it is the walkway between NW21 and NW30. Indoor assembly areas are the NW21-Control Room (rm. 187) and the NW17 Lobby/Reception area on the 2<sup>nd</sup> Floor.

The PSFC will have no formal Evacuation Wardens. Instead, we expect each occupant, especially lab members, to be responsible for each other. For instance, if a lab member has seen another member at any time during that day, and that lab member is not in the assembly area, then it is assumed they may still be in the building, and it is the responsibility of the lab member to inform the appropriate emergency personnel of their concern.

### **ACCIDENT REPORTING PROCEDURE**

It is the supervisor's responsibility to make sure personnel adhere to the following procedures for any job-related accident/injury:

A. The injured person should:

- Immediately report the accident/injury to supervisor, and
- Go directly to the MIT Medical Department, Building E23, for treatment. Campus Police Escort Service should be called on x3-1212 for transportation.
- If possible, contact Matt Fulton (x3-8917) or Karen Cote (x3-9839) so that an accident report can be filed electronically. Please note, Leslie West in the PSFC Personnel Office (x8-5474, NW16-212, west@psfc.mit.edu) must be notified of accidents within 24 hours, either electronically through the accident reporting system, or through your supervisor if you are unable to do so within this time frame.
- NOTE: The Accident Report Form must be received within 24 hours and will be filled out by your supervisor if you are unable to do so within this time frame.

B. If the employee has not done so, the supervisor is responsible for reporting the accident to Matt Fulton or Karen Cote within 24 hours, so that an accident report can be filed.

C. The supervisor is responsible for ensuring that the employee NOT return to work until the EMPLOYEE has:

- Reported to MIT Medical and obtained a "Permission to Return to Work" slip, and
- Turned in the slip noted above to: Leslie West, NW16-212.

### **GENERAL LABORATORY SAFETY RULES AND POLICIES:**

1. Personnel need to complete a safety briefing with their EHS rep. and are to be advised of emergency procedures, egress routes, the locations of fire extinguishers, and the location of safety showers, eyewashes and AED's prior to working in the lab.
2. Working alone is prohibited on operations or experiments which may be hazardous. This includes, but is not limited to work on: high-energy materials; significant quantities of flammable or toxic materials; high pressure systems; radioactive and cryogenic materials; moving equipment and machinery; energized electrical systems; Class IV lasers; and high magnetic fields.

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3. No eating or drinking is allowed in laboratory areas.
4. Use of hazardous chemicals is to be done in accordance with the PSFC Chemical Hygiene Plan. All used and unneeded chemicals are to be disposed of properly, as specified in the [PSFC Hazardous Waste Procedure](#). No chemicals, oils, or solvents are to be poured into sinks, drains, or storm sewers. The EHS Coordinator (Karen Cote) must approve the requisition or purchase of all materials containing potentially hazardous chemicals.
5. Live electrical work is limited to qualified personnel. Work on house electrical systems is to be performed only by a licensed electrician or under the direct supervision of a licensed electrician.
6. The appropriate personal protective equipment (PPE) must be worn in any areas where it is specified or when performing any operation which requires it. Contact Karen Cote with any questions regarding PPE.
7. Confined spaces may only be accessed by personnel who have been approved for confined space work and who have received the required training. Entries must be done in accordance with the PSFC Confined Space Program.
8. Powered industrial equipment (forklifts, cranes) may be operated only by trained and authorized personnel.
9. New experiments and significant changes to existing experiments are subject to review by the PSFC Safety Committee prior to operation.
10. Information about the Environment, Health and Safety Program at MIT can be found at <http://ehs.mit.edu/site/> .

## **PERSONNEL SAFETY EDUCATION**

### **Safety Briefing and Training Needs Assessment**

A safety briefing must be completed with the EHS Rep. that includes in addition to laboratory safety, emergency procedures, egress routes, the locations of fire extinguishers, safety showers, eyewashes and AED's prior to working in the lab. Upon completion of the safety briefing, a PSFC Environment, Health & Safety Compliance Form must be completed and signed. Return the completed form to Karen Cote in NW21-215 or scan/email it to [kacote@psfc.mit.edu](mailto:kacote@psfc.mit.edu).

MIT EHS, Training Need Assessment should be completed within 7 to 10 days of receiving MIT ID card clearance. This is an on-line questionnaire that determines what safety training each person must complete. The Training Needs Assessment can be found <http://ehs.mit.edu/site/training>. This requires an MIT ID number a Kerberos account (MIT email address/Athena account) and an MIT personal certificate available at <https://ca.mit.edu/ca/>.

NOTE: Contact Karen Cote [kacote@psfc.mit.edu](mailto:kacote@psfc.mit.edu), x3-9839 with questions.

- If you are an MIT Grad Student or UROP student, you already have a Kerberos account and Athena account.
- If you are a new PSFC employee or visiting scientist/scholar, check with Leslie West in NW16-212 to obtain an MIT ID number. The MIT ID number is needed to open a Kerberos account (Athena account).
- If you are a Contractor or MIT Temporary, your supervisor needs to set up a "sponsored MIT IS&T account. They can do this by going to, <https://web.mit.edu/accounts/www/guest.html#1/>

## MIT Safety Courses

A list of courses can be found in the course catalog in Atlas (<https://atlas.mit.edu/>).

Whether required or not, all personnel are encouraged to take the various safety courses offered occasionally by the Plasma Science and Fusion Center, especially the potentially life-saving course in CPR.

## SAFETY INSPECTIONS:

The PSFC Safety Committee conducts semi-annual inspections of those MIT buildings under its' jurisdiction (NW14, NW15, NW16, NW17, NW20, NW21, NW22). The EH&S Coordinator conducts safety inspections of PSFC lab and corridor space weekly. The Safety Committee also alerts supervisors of areas where a potentially unsafe condition exists.

Any member of the PSFC community who notices a potential fire, health or other safety hazard is encouraged to report it to their supervisor and/or to any PSFC safety committee member.

## CHEMICALS AND SAFETY PROCEDURES

Users of hazardous substances must be trained in the proper use and precautions required by those materials. The person ordering gases and chemicals is responsible for the proper storage, use, and disposal of these materials. Before chemicals may be brought into a lab, the requisitioner must obtain an approval from Karen Cote the PSFC EHS Coordinator. Safety (SDS) Data Sheets, and appropriate hazard warning labels are attached to hazardous substance and containers. SDS's should be reviewed prior to using a chemical. It is required to have a copy of a SDS for each hazardous substance stored and used in each lab, in addition to a chemical inventory. Chemical inventory must be done and updated annually. SOPs and the use of hazardous materials/chemicals is subject to regular inspection by the PSFC Safety Committee, with some monitoring done by MIT's EH&S office.

Some PSFC SOP's that can be found on the PSFC Safety Website are listed below.

- PFC-CH-91001 [Use of Caustics and Acids Other Than Hydrofluoric](#)
- PFC-CH-91003 [Cryogenic Liquid Handling and Use](#)
- PFC-CH-91004 [Epoxy Resin Systems](#)
- PFC-CH-91005 [Flammable Solvents and Products Containing Flammable Solvents](#)
- PFC-CH-91007 [Halogenated Solvents and Products Containing Halogenated Solvents](#)
- PFC-CH-91008 [Hydrofluoric Acid Etching](#)
- PFC-CH-91010 Photographic Chemicals
- PFC-CH-91011 [Rapid Electroplating](#)
- PFC-CH-92001 Vapor Degreasing Inside the Alcator C-MOD Vacuum Vessel
- PFC-CH-92002 [Compressed Gases](#)
- PFC-CH-92003 Handling and Use of Welding Equipment
- PFC-CH-92005 Electropolishing Stainless Steel
- PFC-CH-92006 Vacuum Pump Oils

## HAZARDOUS WASTE REMOVAL

When you decide you no longer want a hazardous material or chemical, and you want to dispose of it it becomes hazardous waste and must be moved to a SAA. Accumulation Waste Containers must be kept in a Satellite Accumulation Area (SAA), until the container is full, or no longer wanted. All waste in a SAA must be properly segregated, capped, labeled (no abbreviations), and stored (according to chemical characteristics) at all times. Pickup of hazardous waste is coordinated through the MIT EHS waste management program. To request a pickup go to the waste management site found on Atlas <https://ehs.mit.edu/site/content/chemical-waste-collection-form?sapSystemId=PS1>. Once the request has been submitted, the red waste tag must be dated, and the waste removed within three days of the date on the red waste tag. Never dispose of hazardous waste materials by pouring into a sink, drain, storm drain or on the ground.

### ELECTRICAL SAFETY PROCEDURES:

OSHA requires that all persons working on or near energized electrical equipment at voltages > 50 V receive training appropriate to their work. This includes training in the following SOP's:

- PFC-EL-90001 [PSFC Lockout/Tagout Procedures](#)
- PFC-EL-91001 [Minimum Personnel and Administrative Requirements for Work On Electrical Equipment](#)
- PFC-EL-92001 [Qualification of Electrical Workers at the PSFC](#)

### CONFINED SPACE PROCEDURES:

Work performed in a confined space is considered particularly hazardous and requires site specific training. Several areas at the PSFC have identified as confined spaces, e.g., the Alcator C-Mod Vacuum Vessel, and the Alternator Lube Oil Reservoir. Many of the spaces require a confined space permit for entry. All require that work follow a detailed SOP. Those SOP's currently in use are as follows:

- PFC-CH-91002 Confined Space Procedure for the NW20-Alternator
- PFC-CH-91009 Lube Oil Reservoir Confined Space Entry
- PFC-CH-93001 [Confined Space Operations on Alcator C-MOD](#)
- PFC-CS-93004 [Procedure for Issuance of Confined Space Permits](#)
- PFC-CH-93006 [Confined Space Operations for the Alcator C-Mod Igloo](#)
- PFC-CS-94001 Confined Space Operation on the Alcator C-Mod Cylinder

### RADIATION SAFETY PROCEDURES

In matters concerning radiation safety, the Plasma Science and Fusion Center interacts directly with Fred McWilliams and Matt Carey of the MIT Radiation Safety Office. As appropriate, new personnel assigned to work in radiation areas are trained by RSO personnel. All personnel who work in or enter the C-Mod cell during operation are required to have radiation training by RSO, and wear a radiation dosimeter. Questions regarding the radiological dangers and procedures surrounding the fusion experimental facilities should be directed to Karen Cote, Fred McWilliams or Matt Carey.

Use of radioactive materials, sources, and equipment which produce ionizing radiation at MIT must be authorized by the Radiation Safety Office. Use of Class IIIb and IV lasers, microwave sources, and magnetic fields is also overseen by RPP and requires authorization. All Class IIIb and IV lasers must be registered.

### **CUTTING AND WELDING PERMITS**

Cutting and Welding operations outside of designated welding areas require a permit obtainable from, Bill Byford, NW21-109, or Dave Arsenault, NW21-119.

### **MEDICAL SCREENING**

- Eye exams are required for laser and microwave device users and must be completed prior to working on this equipment.
- A medical exam for respirator use is required before anyone at the Institute may wear a respirator and can be obtained through MIT Medical (call 3-7625) to obtain and appointment. A respirator fit test is done at the MIT EHS office upon completion of the medical exam.
- Confined Space Workers in the MFE program are required to have a full medical exam before entering severely restricted confined spaces.
- Persons routinely exposed to a variety of hazardous materials, e.g., lead, beryllium, asbestos, et al, are periodically monitored by the MIT Medical Department.

*Work-Related Medical Exams are given by the MIT Medical Department free of charge.*