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<b>SOP Owner:</b>	Bret Dyer	<b>Approval:</b> EHS: Lou DiBerardinis

# Hot Work Permit SOP

## 1. Purpose / Background

This document describes the requirements for MIT personnel and contractors performing Hot Work. It outlines the administrative controls (permit system) designed to prevent fires.

Under this permit system, Hot Work is defined as burning, cutting, welding, brazing, open flame, spark producing work or other operation that has the potential to cause a fire. If managed improperly, Hot Work has the potential to account for significant building fires and subsequent losses.

Factory Mutual Insurance (FM Global,) City of Cambridge requirements, State of Massachusetts Fire Prevention Codes, Occupational Safety and Health Administration (OSHA) Regulations and the National Fire Prevention Association (NFPA) require the application of fire prevention strategies for cutting and welding (Hot Work) operations.

## 2. Scope

The MIT Hot Work SOP applies to Hot Work conducted at temporary work locations (e.g. repair, maintenance and/or renovation projects) as well as fixed locations (such as welding shops) located inside MIT buildings.


## 3. Prerequisites

None

## 4. General Requirements

An MIT Hot Work Permit is required for work involving burning, welding, cutting, sawing, thawing pipes or similar activity. Hot Work Permit duration should not exceed 5 days, unless fire prevention measures have been developed that are sustainable over a longer period on time. The Department of Facilities Fire Protection Supervisor and the EHS Office is available to assist in developing fire prevention strategies.

- 4.1** Hot Work shall not be conducted when building fire suppression systems are impaired. Exceptions shall be reviewed by the MIT EHS Office and the Department of Facilities Fire Protection Supervisor.
- 4.2** MIT trades-persons and contractors involved in repair and maintenance and/or renovation projects who plan to conduct Hot Work shall request an MIT Hot Work Permit. Contractors shall apply for a fire permit from the City of Cambridge Fire Prevention Office.
- 4.3** Any cutting and welding to be done by outside contractors in an occupied building requires a CFD Fire Watch detail. Exceptions to this requirement need to be reviewed by the Director of EHS or Director of Facilities or their designee.
- 4.4** The Authorized Hot Work Supervisor (AHWS) shall assign a fire watch attendant when standard precautions will not totally eliminate the hazards.
- 4.5** Fixed locations where Hot Work is routinely conducted shall be defined as Designated Hot Work Areas. These areas shall be isolated by screens, walls or noncombustible partitions. Areas shall be kept free of combustible materials and provided with exhaust ventilation to remove fumes and smoke.

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- 4.6** Hot Work Permits for Designated Hot Work Areas (such as welding shops,) shall be issued, and renewed annually, by the MIT EHS Office.
- 4.7** **Exceptions-** Hot work conducted outdoors does not require an MIT Hot Work Permit, although a job hazard analysis is still required. Contractors working on MIT Capitol Projects are not required to obtain an MIT Hot Work Permit unless the activity poses a risk to MIT employees and students in occupied buildings. Designated Hot Work areas (welding shops) are exempt from CFD Fire Watch details.

## 5. Procedures

- 5.1** Initiating a Request for a Hot Work Permit: – Workers planning to conduct Hot Work shall contact an AHWS and/or the Facilities Project Manager to conduct a job hazard analysis and communicate any known hazards associated with conducting the work.
- 5.2** Hot Work Job Hazard Analysis – In consultation with the initiator, the AHWS, Project Manager or the EHS Office shall review the job and assess the potential hazards, determine appropriate precautions including the need for fire watch attendants, area/equipment fire isolation, charged hoses and/or fire extinguishers, fire resistant barriers and/or floor coverings. Fire prevention measures shall be documented by completing the reverse (checklist) side of the MIT Hot Work Permit Form.
- 5.3** An electronic version of the MIT Hot Work Permit form is available by contact the EHS Office.
- 5.4** Implementation of fire prevention measures – Prior to the beginning of the hot work, all fire prevention measures outlined on the MIT Hot Work Permit shall be implemented.
- 5.5** Approval of Hot Work Activity – the AHWS or Project Manager indicates approval and authorization via signature on the Hot Work Permit Form. The form shall identify the names of the welder/hot work initiator, any contractor representatives (if appropriate) and the designated fire watch attendant.
- 5.6** Required Precautions During Hot Work Activity – During the Hot Work activity, the agreed upon precautions shall remain in affect, otherwise the hot work activity shall be terminated.
- 5.7** Completion of Hot Work – Once the Hot Work has been completed, the fire watch attendant or welder shall inspect the area after 30 minutes (60 minutes is the preferred time) to ensure that no hidden, incipient or smoldering fire exists. The fire watch attendant and the Hot Work initiator shall “sign off” the MIT Hot Work Permit Form remove it from the work area and return it to the Facilities Operations Center or Project Manager. Any incidents shall be noted on the permit form.
- 5.8** In the event of an emergency – If a fire occurs, the Hot Work shall be stopped. Initiate a building alarm by activating the nearest fire alarm pull station. Response to an incipient fire related to Hot Work is limited to individuals who have been trained in the use of portable fire extinguishers. All fires (regardless of size) shall be reported to the AHWS and/or Facilities and the MIT EHS Office.

## 6. Roles & Responsibilities

- 6.1** Approved Hot Work Permit Supervisor (AHWS) - An AHWS (Project Manager or EHS) is authorized to issue MIT Hot Work Permits to employees and contractors
- Conduct a job hazard analysis of the proposed hot work activity.

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- Determine if the Hot Work can be avoided or conducted at an outdoor location.
- Confirm that the work area is equipped with portable fire extinguishers and ensure that fire protection systems are activated.
- Identify any smoke detection systems that could be inadvertently activated by the Hot Work activity (smoke/fumes) and coordinate shutdown.
- Arrange for Fire Watch detail for cutting and welding in occupied buildings.
- Document the appropriate precautions to be taken to minimize the hazards (and therefore the risk) associated with the work. Precautions may include the removal of combustible materials from the work area, making fire retardant blankets available, closing floor and wall openings etc. Communicate all precautions to those individuals involved in the Hot Work activity.
- Authorize the MIT Hot Work Permit Form via signature and ensure that the Facilities Operation Center is copied/receives notice.
- Participate in investigations of any fire incident related to Hot Work activity.

**6.2** Fire Watch Attendant - An individual who has been designated to observe Hot Work activity during and after completion. The Fire Watch shall;

- Ensure that the safety precautions outlined by the AHWS (specified on the permit) remain in place during the course of the work.
- Ensure that a Hot Work Permit Form approved by the AHWS is posted in the work area.
- Monitor the job and stop the Hot Work if it is observed that the precautions that were previously implemented fail to prevent a potential fire situation. If necessary, use a portable fire extinguisher on incipient stage fires.
- Inspect the work area after breaks & 30 minutes (preferably 60 minutes) after the completion of the job.
- After completion of the job, return the signed off Hot Work Permit to the Facilities Operations Center.


**6.3** Trades Supervisor/Project Manager/Worker

- Initiate the request for a Hot Work Permit through an Approved Hot Work Supervisor (AHWS.) Inform the AHWS on the nature of the proposed Hot Work activity.
- Ensure that contractors acquire a Fire Permit for Hot Work from the Cambridge Fire Prevention Department.
- Ensure that contractors are familiar with the MIT Hot Work Permit process.
- Designate a fire watch as directed by the AHWS.
- Ensure the work does not begin until all required precautions have been implemented and the MIT Hot Work Permit Form has been authorized by the AHWS.

**6.4** MIT EHS Office

- Provide training programs for Approved Hot Work Supervisors (AHWS.)
- Provide expertise and monitoring equipment for detecting the presence of toxic or flammable vapors as needed.
- Assist with Hot Work job hazard analysis, as needed.
- Periodically review the effectiveness of the MIT Hot Work Permit program implementation by inspecting hot work locations.
- Assist the AHWS with investigating fires resulting from Hot Work activity.
- Perform assessments of Designated Hot Work Areas and issue Hot Work Permits specific to those areas.

**6.5** Contractors

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- Ensure that the requirements of this SOP are met.
- Obtain an authorized MIT Hot Work Permit Form from an AHWS.
- Ensure that sub-contractors under their control are familiar with the MIT Hot Work Permit Program.
- Obtain Fire Permits and schedule Fire Watch Details from the Cambridge Fire Department.

## 6.6 Facilities Operations Center

- Monitor outstanding Hot Work Permits with respect to area smoke detectors and building sprinkler systems and fire alarm systems.
- Retaining closed out Hot Work Permit on file for a period of 12 months.

## 7. Training

Personnel involved in issuing Hot Work permits shall receive initial training to perform their assigned function under the Hot Work Permit Program. Authorized Hot Work Supervisors and Fire Watch Attendants shall receive Hot Work Supervisor training as follows. The Training Plan includes;

- Review of the MIT Hot Work Permit Program.
- Roles and responsibilities of AHWS, fire watch attendant and contractors.
- Hot Work job hazard analysis.
- Industrial Hygiene-exhaust ventilation, exposure control and PPE.
- Regulatory review.
- Portable fire extinguisher use (initial only.)
- Emergency Procedures.

## 8. Monitoring Requirements

Not applicable

## 9. Record Management

The EHS Office shall maintain a file of completed Hot Work Permits.

## 10. References

**10.1** OSHA - 1910.251 - 255, "Welding, Cutting and Brazing"

**10.2** OSHA 1926.XXX "Welding, Cutting and Brazing"

**10.3** 527 CMR 39.00 Welding and Cutting Processes - Board of Fire Prevention Regulations

**10.4** Factory Mutual Global - Data Sheet 9-5 / 15-1 Hot Work


**10.5** Factory Mutual Global - Data Sheet 1-0 Safeguards during Construction, Alteration and Demolition

**10.6** NFPA 51B, Fire Prevention in the Use of Cutting and Welding Processes

**10.7** NFPA 241, Safeguarding Construction, Alteration and Demolition Operations - Chapter 3 Hot Work Operation

## 11. Other SOP/ SOGs

SOP\_001 MIT Compressed Gas SOP

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## 12. Definitions

**Hot Work**- Activity involving the use of open flames or sources of heat producing energy that is capable of initiating a fire or explosion. Examples include cutting, welding, brazing, thawing pipes, or similar work that is to be conducted in the vicinity of combustible materials. The use of electric soldering irons, Bunsen burners or candles is not considered to be Hot Work.

**Hot Work Job Hazard Analysis (JHA)**-is a technique that focuses on job tasks as a way to identify hazards before they occur. The JHA focuses on the relationship between the worker, the task (e.g. Hot Work) and the work environment. Measures to eliminate (or at a minimum, significantly reduce) the hazards are developed and implemented.

**Hot Work Permit Form**-The Hot Work Permit form is used to document the precautions, scope and duration of a Hot Work activity. It serves as an authorization to conduct Hot Work.

**Designated Hot Work Area**- A fixed location where Hot Work is performed on a routine basis. Examples at MIT include maintenance/plumbing shops and welding shops.

**Fire Watch**- A fire watch is an observation role assigned to a person(s) with the goal of detecting fires during the incipient stage, before the fire spreads. Fire watch observation during Hot Work is conducted both during and after the job has been completed.

**Approved Hot Work Permit Supervisor (AHWS)** - An individual who is responsible for oversight of Hot Work activity and has completed Hot Work Permit Training administered by MIT EHS Office. Typically a Manager, Supervisor or Project / Lab. Manager.

**National Fire Prevention Association 241**- The NFPA Standard for Safeguarding Construction, Alteration and Demolition Operations, of which, section 5-1 deals exclusively with Hot Work.