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Specification
for

SUNY Poly Hot Work Procedure

REVISION

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6	DCN1420	Updates to reflect changes at the facility and with codes	7-13-17	D.Brookhart	T.Diamond

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1 PURPOSE

The purpose of this document is to ensure the safe operation of hot work equipment and operations at all facilities of SUNY Polytechnic Institute (SUNY Poly) in accordance with the requirements set forth in 29 CFR 1910 Subpart Q- *Welding, Open Flame, Cutting, and Brazing* and 2015 IFC Chapter 35 Welding and Other Hot Work.

2 SCOPE

A Hot Work Permit (EHS-00029-F1 Albany or EHSU-00029-F1 Utica) must be completed any time an activity involves the use of an open flame or spark producing equipment. Such activities include, but are not limited to, welding, TIG welding, cutting, brazing, burning, grinding and soldering operations.

These work instructions apply to all SUNY Poly employees, tenant employees, students, contractors and sub-contractors that are engaged in hot work operations at all SUNY Poly sites.

3 EXCEPTIONS

- IR Welding
- Orbital in NON-HPM areas
- TIG may be allowed for monthly permit if pre-approved by EHS
- Electric Soldering Irons
- Cooking Operations
- Lab use of Bunsen Burners
- Classrooms and / or Lab Hoods

4 DEFINITIONS

- **Hot Work:** Work that requires welding, brazing and / or cutting
- **Hot Work Operator:** Person physically performing the Hot Work
- **Fire Watch Person:** Persons designated for fire watch during Hot Work and for 30 minutes after all Hot Work has been completed.
- **(HPM)** Hazardous Production Materials
- **(AAC)** Area Alarm Controller
- **(TGMS)** Toxic Gas Monitoring System
- **(PPE)** Personal Protective Equipment

5 RESPONSIBILITIES

- 5.1 **The Hot Work Operator** is responsible for ensuring that all equipment is inspected prior to use, that equipment is in good operating order and that the appropriate controls have been put in place in accordance with the Hot Work Permit (EHS-00029-F1 or EHSU-00029-F1)

- 5.2 **Fire Watch Person** shall have **appropriate** fire extinguishing equipment readily available and be trained in its use. They shall be familiar with **activating the nearest pull station and emergency contact numbers** in the event of a fire. They shall watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm. A fire watch shall be maintained for at least **30 minutes** after completion of **Hot Work** operations to detect and extinguish possible smoldering fires
- 5.3 **Work Sponsor** shall recognize the responsibility for the safe usage of **Hot Work** on the property and based on fire potentials, establish areas for **Hot Work** in other areas. Designate an individual responsible for authorizing **Hot Work** operations in areas not specifically designed for such processes. Ensure that **all people performing Hot Work** and their supervisors are suitably trained in the safe operation of their equipment and the safe use of the process. Advise all contractors about flammable materials or hazardous conditions of which they may not be aware
- 5.4 Work Sponsor and operator sections must be completed at time of submittal to Work Authorization Permit Meeting (**Albany site only**) on both the Work Authorization Permit and the Hot Work Sub-Permit. **The operator may not be known at the time of permit submission.**
- 5.5 **Supervisor/Manager** shall be responsible for the safe handling **and operation** of equipment. Determine that combustible materials and hazardous areas present or likely to be present in the work location have been identified. Ensure combustibles are protected from sources of ignition. Secure authorization for the cutting or welding operations from the designated management representative. Determine that the Hot Work operator secures his approval, and that conditions are safe before going ahead. Ensure that fire protection and extinguishing equipment are properly located at the work location. Where fire watches are required, ensure that they **are maintained through the duration of the work and for 30 minutes post completion.**

6 ASSOCIATED DOCUMENTS

- 6.1 **EHS-00029-F1 CNSE Hot Work Permit (Albany Site only)**
- 6.2 **CFM-00004 Obtaining Work Authorization Permits (Albany Site only)**
- 6.3 **CFM-00004-F1 Work Authorization Permit (Albany Site only)**
- 6.4 **CFM-00005 Obtaining Fire Protection System Daily Permits Instructions (Albany Site only)**
- 6.5 **CFM-00005-F1 Fire Protection System Daily Permit (Albany Site only)**
- 6.6 **EHSU-00029-F1 Utica Hot Work Permit (Utica Site Only)**

7 SAFETY

- 7.1 Prior to the beginning of the work, the hot work operator shall evaluate the need for engineering controls and necessary Personal Protective Equipment (PPE).
- 7.2 **Engineering Controls** – A fume collector or maintenance exhaust shall be used as a control to allow for the adequate removal of fumes from the Hot Work Operators breathing zone. A fume collector shall be selected for Hot Work operations based on 29 CFR 1910.252(c)(1)(iii), 29 CFR 1910.252(c)(2)(i), and the following circumstances:
- 7.2.1 The number of Hot Work Operators conducting Hot Work in one area, simultaneously (minimum of 10,000 cubic feet per welder)
- 7.2.2 The possible evolution of hazardous fumes, gases, or dust as a result of the use of such metals as Fluorides, Zinc, Beryllium, Mercury, Cadmium, Lead, Stainless Steel, and/or Cleaning Compounds
- 7.2.3 The Hot Work being performed is in an enclosed, confined or screened area, which is not equipped with adequate ventilation
- 7.3 **Eye and Face Protection** – All glass for lenses shall be tempered, substantially free from air bubbles, waves and other flaws. Except when a lens is used to provide proper optical correction for defective vision, the front and rear surfaces of lenses and windows shall be smooth and parallel
- 7.3.1 Lenses shall bear some permanent distinctive marking by which the source and shade may be readily identified

- 7.3.2 The following is a guide for the selection of the proper shade numbers for [Lenses](#)

29 CFR 1926.102(c)(1) Table E-1

Welding operation	Shade No.
Shielded metal-arc welding - 1/16, 3/32, 1/8, 5/32 inch electrodes	10
Gas-shielded arc welding (nonferrous) - 1/16, 3/32, 1/8, 5/32 inch electrodes	11
Gas-shielded arc welding (ferrous) - 1/16, 3/32, 1/8, 5/32 inch electrodes	12
Shielded metal-arc welding: 3/16, 7/32, 1/4 inch electrodes	12
5/16, 3/8 inch electrodes	14
Atomic hydrogen welding	10-14
Carbon arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1 inch to 6 inches	4 or 5
Heavy cutting, 6 inches and over	5 or 6
Gas welding (light) up to 1/8 inch	4 or 5
Gas welding (medium) 1/8 inch to 1/2 inch	5 or 6
Gas welding (heavy) 1/2 inch and	6 or 8

- 7.3.3 A welding helmet with filter lenses and plates must meet the test for transmission of radiant energy prescribed in ANSI Z87.1-[2015](#)
- 7.4 **Protective Clothing** – Employees exposed to the hazards created by welding, cutting, or brazing operations shall use heat resistant apron, sleeves and gloves that are appropriate for Hot Work Operations [29CFR 1910.138\(a\)](#)
- 7.5 **Protective Screens** – Shall be put in place to protect persons from the visual effects of viewing arc welding or cutting and during gas or oxygen cutting or welding [29CFR 1910.252\(a\)\(1\)\(ii\)](#)
- 7.6 **Protective Barrier** – Area shall be cordoned off with barriers and warning signs to prevent any unauthorized access or entry during any Hot Work activities

8 PROCEDURE

8.1 **Area Inspection**

- 8.1.1 Prior to starting a project that requires Hot Work, the supervisor of the Hot Work Operator or in certain cases the Hot Work Operator shall obtain a Hot Work Permit (EHS-00029-F1 or [EHSU-00029-F1](#)) from [SUNY Poly](#).

Intranet/Internet, complete it, and obtain appropriate EHS/Facilities approvals.

- 8.1.2 Prior to [activating and signing](#) the Hot Work Permit, the *EHS/ERT department* shall inspect the area using the checklist contained within the Hot Work Permit. Items included in this review include, but are not limited to:
- That the Hot Work operator(s)/fire watch are trained in the safe operation of their equipment
 - [Floors have been kept clean of debris, and all openings are protected](#)
 - If the Hot Work is in the HPM [area or building](#) then special precautions and notifications must be followed
 - Hot Work Operator must verify the apparatus used for the Hot Work is in good condition
 - Hot Work Operator must verify they leak checked all equipment prior to use (hoses, regulators, cylinders)
 - Verify that the Hot Work Operator(s)/fire watch understand the emergency procedures in the event of a fire or general emergency
 - Verify location of fire protection and extinguishing equipment
 - Verify that operator(s) are utilizing [PPE](#)
 - Verify that the proposed work does not jeopardize the health and safety of the operator or others
- 8.1.3 If the aforementioned criteria are not met, a permit shall not be issued until all concerns are corrected
- 8.1.4 If there are automatic fire detection devices present in the immediate area that need to be deactivated to prevent alarms, the Hot Work Operator must [submit appropriate permits, and](#) contact [Security \(Albany\), University Police, and / or Facilities \(Utica\)](#) to place the system in an 'off-line status', so smoke and heat detectors that might be affected by the work do not trigger a building evacuation
- 8.1.5 In the event the Hot Work is taking place in an [Albany HPM area or building then](#) special precautions need to be taken before work in these areas can occur
- The use of Maintenance Exhaust is mandatory (NO EXCEPTIONS) in the HPM Corridor [or rooms](#) either by a snorkel (preferred) or a "LISTED" portable [fume collector](#)
 - As much pre-facilitation as possible is required ahead of time to minimize downtime and impact
 - [Any HPM area or building](#) must be put into Maintenance Mode and Security must be notified

- In any HPM area or building Hot Work needs the TGMS team's signature on the Hot Work Permit (EHS-00029-F1) prior to the work beginning....Any HPM area or building work needs to be clearly defined step-by-step in the Work Authorization Procedure CFM-00004-F1 for the TGMS team to review (Albany Only)
- An ERT is required to be present and monitor the HPM area or building AAC screen while the HPM area or building TGMS system is in maintenance mode until at which time the HPM area or building AAC is taken out of Maintenance Mode and Security has been notified
- An Air Liquide technician is also required to be present for the entire duration of the HPM Corridor or rooms Hot Work to recover any gas cabinet in the event of a false alarm
- A minimum 3 days notification is required for any Hot Work in any HPM area or building in order to ensure adequate shift coverage from Air Liquide
- In the event an actual HPM area or building TGMS alarm should occur while the HPM Corridor AAC is in Maintenance Mode then the ERT would be required to execute proper HPM area or building evacuation protocol based on the nature of the alarm

8.2 **Fire Watch**

8.2.1 The EHS Department requires the Hot Work Operator conducting the Hot Work to provide a fire watch when Hot Work is performed in a location where one or more of the following conditions exist

- Combustible materials in building construction or building contents are closer than 35 feet to the point of operation of the Hot Work
- Combustible materials are more than 35 feet away, but are easily ignited by sparks
- Wall or floor openings within a 35-foot radius with combustible materials in adjacent areas, including concealed spaces in walls or floors
- Combustible materials are adjacent to the opposite side of partitions, walls, ceiling, or roofs and are likely to be ignited

8.2.2 The fire watch shall be maintained during all breaks, at no less than once per day, and 30 minutes after completion of the Hot Work Operation in order to detect and extinguish smoldering fires on the floors above, below and adjacent to the Hot Work area, if applicable. A final review shall take place by the designated Fire Watch person thereafter to ensure the Hot Work area is free from fire, and at that point the fire watch can be extended at the discretion of the person performing the fire watch

8.3 **Permit Posting**

8.3.1 A copy of the Hot Work Permit shall be retained and filed by the EHS and Facilities Departments; and a copy shall be posted in a visible location within the Hot Work area.

8.4 **Prohibitions**

8.4.1 Hot Work shall not be permitted in the following areas until the conditions prohibiting Hot Work have been modified

- In the presence of explosive atmospheres, or in situations where explosive atmospheres may develop inside contaminated or improperly prepared tanks or equipment which previously contained flammable liquids
- In areas with an insufficient exhaust source or accumulation of combustible debris, dust, lint, and oily deposits
- In areas near the storage of exposed, readily ignitable materials such as combustibles
- On a container such as a barrel, drum or tank that contained materials that will emit toxic fumes when heated; and/or
- In a confined space, until the space has been inspected and determined to be safe Ref: [EHS-00007](#)

9 **TRAINING**

Personnel shall be properly trained to perform any Hot Work Operations at SUNY Poly sites. Ref: [SUNY Poly Intranet for Hot Work training and or equivalent](#).

10 **SPECIAL CONDITIONS**

Chemical Storage areas (UTICA ONLY) may require additional approvals and precautionary measures, please consult EHS.

11 **RECORDS**

Completed Hot Work Permit(s) shall be kept on file in the EHS Department for a [minimum of three years](#).