Hot Work Procedure

REVISION

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2		Utica Applicable updates	6/1/2020		S.Clive

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1 PURPOSE

Regulations promulgated by the Occupational Safety and Health Administration (OSHA—29 CFR 1910.252 - Welding, Cutting and Brazing) and the NYS Fire Code (Code Chapter 35—Hot Work) require facilities to develop procedures to protect both human health and welfare, and the facility itself, from the hazards posed by hot work in the workplace. This program is intended to provide the SUNY Poly - Utica community with the guidance necessary to comply with these regulations.

The purpose of this document is:

- To ensure the safe operation of hot work equipment and operations at all facilities of SUNY Polytechnic Institute in accordance with the requirements set forth in 29 CFR 1910 Subpart Q, and 2015 IFC Chapter 35 - *Welding, Open Flame, Cutting, and Brazing*
- To pinpoint areas where hot work can be conducted, to establish what controls shall be utilized and to determine what training is needed.
- To identify hot work operations, due to their risk, that may be exempt from this procedure.

2 SCOPE

SUNY Poly - Utica is committed to providing a safe and healthful work environment for its students, employees, and the greater college community. The following Hot Work Program (HWP) has been developed to eliminate or minimize risks to personnel, students, and campus facilities. While the greatest hot work risks arise from spark/slag producing activity (e.g. welding, cutting, brazing), other forms of hot work (e.g. pipe soldering, pipe thawing, etc.) may also present risks in the form of radiant heat and/or open flame. As such, certain elements of this program will pertain to all types of hot work activity, and others will only address the more dangerous activities that produce sparks.

This HWP includes:

- Identification of Responsibilities
- Prohibited Hot Work Areas/Activities
- Welding/Cutting/Brazing Authorization Process
- Hot Work Permits
- Special Considerations for Soldering/Other Hot Work Activities
- Fire Watch
- Contractors

A Hot Work Permit (EHSU-00029-F1 / EHSU-00029-F2) 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 SUNYPOLY sites

3 APPLICABILITY

This Policy and Procedure applies to all activities on the SUNY Poly – Utica campus.

4 EXCLUDED HOT WORK / OPEN FLAME ACTIVITIES

There are several other types of activities that occur on College premises that utilize heat and / or open flames, including:

- IR Welding
- Orbital Welding
- TIG may be allowed for monthly permit if pre-approved by EHS
- Electric Soldering Irons in Laboratory or electronics workshop settings *(see separate SOP)*
- Laboratory use of Bunsen Burners *(see separate SOP)*
- Classrooms and or Lab Hoods
- Food cooking or warming using gas/charcoal grills or solid fuel canisters (e.g. Sterno)
- Candle use for religious or other ceremonial purposes *(see separate SOP)*

This HWP is not intended to apply to any of these hot work/open flame activities and are therefore excluded. However, as other regulations and / or best management practices for safeguarding against the inherent fire safety hazards of these activities do apply, SOPs are available to address some of these activities.

Procedures for the safe use of food cooking / warming operations with open flames is the responsibility of the College's food service provider. However, communication with EHS is necessary to ensure adequate fire protection.

5 DEFINITIONS

- **Hot work;** Work activities including, but not limited to, welding, cutting, brazing, burning, grinding and soldering operations.
- **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

6 RESPONSIBILITIES

6.1 **The Environmental Health & Safety (EHS)** office will maintain and update the College's written Hot Work Program, and will work primarily with other relevant parties (e.g. Facilities Department and certain academic departments) for training and compliance purposes.

6.2 **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 (EHSU-00029-F1/F2)

6.3 **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

6.4 **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

6.5 **Supervisor / Manager / Instructor / Advisor** 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 approval 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

7 ASSOCIATED DOCUMENTS

- **EHSU-00029-F1** - Hot Work Permit (General form for all Hot Work activities on campus)
- **EHSU-00029-F2** - Academic Hot Work Permit (Specific form for Hot Work in Academic Class or Club setting – in approved locations issued for each semester)

8 SAFETY

8.1 Prior to the beginning of the work, the hot work operator shall evaluate the need for engineering controls and necessary Personal Protective Equipment. (PPE)

8.2 **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:

8.2.1 The number of hot work operators conducting hot work in one area, simultaneously (minimum of 10,000 cubic feet per welder)

8.2.2 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 *(materials containing these items shall be avoided)*

8.2.3 The hot work being performed is in an enclosed, confined or screened area, which is not equipped with adequate ventilation

8.3 **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

8.3.1 Lenses shall bear some permanent distinctive marking by which the source and shade may be readily identified

8.3.2 The following is a guide for the selection of the proper shade numbers

29CFR 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, 5/3 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 5/16, 3/8 inch electrodes	 12 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

8.3.3 A welding helmet with filter lenses and plates must meet the test for transmission of radiant energy prescribed in ANSI Z87.1-2015

8.4 **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)

8.5 **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)

8.6 **Protective Barrier** – Area shall be cordoned off with barriers and warning signs to prevent any unauthorized access or entry during any hot work activities

8.6.1

9 PROCEDURE

9.1 **Area Inspection**

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 (EHSU-00029-F1/F2) form via SUNY Poly Intranet/Internet, complete it, and obtain appropriate EHS/Facilities approvals

Prior to activating and signing the Hot Work Permit, the EHS/Facilities 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
- 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 (e.g. hoses, regulators, cylinders)
- Verification that the hot work operator(s)/fire watch understand the emergency procedures in the event of a fire or general emergency
- Verification and location of fire protection and extinguishing equipment
- Verification that operator(s) are utilizing PPE
- Verification that the proposed work does not jeopardize the health and safety of the operator or others

9.1.1 If the aforementioned criteria are not met, a permit shall not be issued until all concerns are corrected

9.1.2 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

9.1.3 The use of Maintenance Exhaust is mandatory (NO EXCEPTIONS either by a snorkel (preferred) or a NRTL "LISTED" portable fume collector

9.2 **Fire Watch**

The person conducting the hot work must 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 feet radius expose 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

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

9.3 **Permit Posting**

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

9.4 **Prohibitions**

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 R7**

10 TRAINING

Personnel shall be properly trained to perform any hot work operations on the SUNY Poly site. Ref: SUNY Poly intranet for Hot Work training and or equivalent.

11 SPECIAL CONDITIONS

Chemical Storage areas may require additional approvals and precautionary measures, please consult EHS Department.

12 RECORDS

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

13 APPENDICES

13.1 Forms & References

General Info and Procedure for Hot Work

Hot Work Code Requirements

OSHA Hot Work Regulation

13.2 Hot Works Training

13.2.1 Hot Work General Awareness – https://drive.google.com/open?id=1dRyeGMrOIE2wrNct78s3BonFwSttNJEgVhunkWE-DDo

13.2.2 Hot Work Safety Operations - https://drive.google.com/open?id=10WYb7XIH53coba1r45Orn3Uud1W18c4avIjdlmA46XY

13.2.3 Welding Safety - https://drive.google.com/open?id=1_n9UV0hz11AN3bacaDa62HvxxogSChzET9zJKgOGHu0

13.2.4 Fire Extinguisher Use - https://drive.google.com/open?id=1Mv940ujtKZNBZQZR9whz5GmTbOMiEO4hK-EECloBHfc

13.2.5 Dry Chemical Extinguisher Training - https://drive.google.com/open?id=1o8wDwb8aI7QQz_dVF76ZVOK6v39s1IGYK7nq9cfVpa4