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**Standard Operating Procedure
for
Non-Routine Hazardous Work (NRHW) Permit**

REVISION

Rev No.	DCN No.	Change Summary	Release Date	DCN Initiator	Document Owner
9	DCN1645	Delete requirement for NRHWP for "experiments"	1-14-19	Ken Gelting	Tom Diamond

Prior revision history, if applicable, is available from the Document Control Office.

1. PURPOSE

This document establishes the requirements to perform Non-Routine Hazardous Work (NRHW) that involves Hazardous Production Materials (HPMs) at SUNY Polytechnic Institute (SUNY Poly).

2. SCOPE

This requirement is applicable to SUNY Poly employees, students, and principal investigators, service engineers, Tool Owners, chemical and gas service suppliers, equipment technicians, and facility operators who perform non-routine hazardous work (NRHW) activities on tools and equipment at SUNY Poly.

3. APPLICABILITY

3.1. Work activities involving any of the following:

a) Work that has no pre-approved procedure(s) or work instruction(s) involving HPMs

or

b) A first of a kind work activity on this site, involving HPMs, to ensure that all site requirements are met.

or

c) III-V (e.g., gallium, arsenic, phosphorus films) processing unless accepted by EHS.

3.2. If one of the above criteria applies, complete the NRHW permit requirements and/or contact EHS for further guidance, if necessary.

3.3. To eliminate the need for a 'Non-Routine Hazardous Work Permit', contact EHS to review any proposal and/or procedures to make the specific work activities to be considered 'Routine Work' instead of 'Non-Routine Hazardous Work'.

4. DEFINITIONS

4.1. **Academic:** Relating to or associated with the SUNY Poly colleges' laboratories, courses and programs of study.

4.2. **ERT:** Emergency Response Team. Trained employees who respond to emergencies.

- 4.3. **Hazard:** A situation that poses a threat to life, health, property or environment from the following but not limited to exposures; extreme temperature, pressure, previously contaminated sub-systems, mechanical, electrical, pneumatic, hydraulic, chemical, or thermal.
- 4.4. **Hazardous Production Materials (HPMs):** A solid, liquid or gas associated with semiconductor manufacturing that has a degree-of-hazard rating in health, flammability or instability/reactivity of Class 3 or 4 as ranked by NFPA 704 and which is used directly in research, laboratory, facility or production processes which have as their end product materials that are not hazardous.
- 4.5. **Lockout/Tagout:** Addresses the procedures necessary to disable equipment, thereby preventing the release of hazardous energy while employees perform servicing and maintenance activities. It outlines measures for controlling hazardous energies—electrical, mechanical, hydraulic, pneumatic, chemical, thermal, and other energy sources.
- 4.6. **Non-Academic:** Relating to or associated with the SUNY Poly's: Fabs (e.g., NanoFabs North, South, South Annex, Central, Xtension); Buildings (e.g., Zero Energy Nano (ZEN)); Commercial Labs; and Facilities Operations and Services.
- 4.7. **Non-Routine Hazardous Work (NRHW) Permit:** Authorized form (EHS-00062-F1) that allows hazardous work to be done.
- 4.8. **Non-Routine Work:** Modifications or maintenance tasks performed on equipment that house or use HPMs as defined in Section 3.0.
- 4.9. **PPE:** Personal Protective Equipment - Used to protect personnel from chemical and physical hazards. Examples are safety glasses, respiratory protection, and protective clothing.
- 4.10. **Pre – Approved:** A procedure that has been reviewed and approved by a third party organization, SUNY Poly EHS, or is a documented procedure provided by the manufacturer or supplier.
- 4.11. **Routine Work:** Modification or maintenance tasks performed on equipment or tools that have been determined to be non-risk or documented in approved work instructions.
- 4.12. **Risk Assessment:** A sequential process that identifies the hazards associated with a task; identifies the control measures to be put in place (including detailed work activities, PPE, and training requirements) to eliminate or control the hazard(s) by identifying monitoring requirements and establishing safe work procedures and requirements. This provides the information necessary to complete the NRHW. Examples are PPE Hazard Assessments and Job Hazard Analysis (JHA).

- 4.13. **Risk Assessment Team:** Consists of the Company EHS Representative and necessary support personnel. Teams are allowed to add any additional members who have knowledge, experience or expertise that could benefit the outcome of the assessment. The risk assessment teams are as follows:
- 4.13.1. Cleanroom Related Activities: Tenant(s) Equipment Engineer(s), SUNY Poly Equipment Engineer, Chemical and Gas Services Manager, SUNY Poly and/or Company EHS Representative.
- 4.13.2. SUNY Poly Academic Experiments/Activities: Principal Investigator (PI), SUNY Poly Equipment Service Group Manager, Researcher, SUNY Poly and/or Company EHS Representative.
- 4.13.3. Facility Activities: Facility Engineering Manager Engineer, Facility Engineer, System Owner, Tenant Equipment Engineer, SUNY Poly Equipment Engineer, SUNY Poly and/or Company EHS Representative.
- 4.14. **Tool Owner:** Engineer, technician, or facility operator who is responsible for the safe operation of the equipment, process module, or tool running process in the lab or facility.
- 4.15. **Work Coordinator:** The technical liaison, field coordinator, contract administrator, designated representative, or project coordinator responsible for maintaining technical liaison with the Contractor, or the owner or employee of any business that is engaged to perform work on the SUNY Poly site. The work coordinator also determines the adequacy and acceptability of the work supplied by the Contractor, or the owner or employee of the business.

5. RESPONSIBILITIES

- 5.1. **Tool Owner/Researcher/Engineer/Requestor** responsible for:
- 5.1.1. Following this instruction and completing the NRHW Permit, as necessary.
- 5.1.2. Coordinating the subcontractor's activities; including the action for obtaining a NRHW permit.
- 5.1.3. Conducting Risk Assessments on the work task(s), prior to submitting the NRHW Permit.
- 5.1.4. Contacting SUNY Poly Environmental, Health, and Safety (EHS) (i.e., Dan Greenlee, Jon Hellman, Darren Brookhart, Kasey Rydberg, or Tom Diamond) to identify approval signatures required on the NRHW Permit.
- 5.1.5. Obtaining written approval (by completing **EHS-00062-F1** NRHW Permit) prior to submitting the Work Authorization Permit and beginning work.

- 5.1.6. Verifying safe conditions of tool, equipment, and work area after work has been completed.
- 5.2. **SUNY Poly Management** responsible for:
 - 5.2.1. Enforcing the requirements of this document
- 5.3. **SUNY Poly EHS** responsible for:
 - 5.3.1. Identify approval signatures required on the NRHW Permit.
 - 5.3.2. Review the NRHW activities, completed hazard assessment(s) and NRHW permit.

6. ASSOCIATED DOCUMENTS

- 6.1. **CFM-00004** Obtaining Work Authorization Permits
- 6.2. **CFM-00004-F1** Work Authorization Permit
- 6.3. **OPS-00005** Cleanroom Tool Maintenance SOP
- 6.4. **OPS-00005-F1** Cleanroom Tool Maintenance Form
- 6.5. **EHS-00010-F1** Hazard Assessment and Personal Protective Equipment (PPE) Selection Form
- 6.6. **EHS-00062-F1** Non-Routine Hazardous Work (NRHW) Permit
- 6.7. **FEI-00003** Facilities Resource Responsibility Matrix for Facilities System Owners

7. INSTRUCTION STEPS

7.1. Non-Routine Hazardous Work

- 7.1.1. If the work meets the applicability of NRHW, the requestor must contact the Risk Assessment Team specified in Section 4.11 and perform a risk assessment.
- 7.1.2. The Risk Assessment (defined in Section 4.10) is conducted prior to the work commencing. This Assessment determines the hazards and assesses the preventive and protective measures needed to reduce risk and complete the NRHW Permit, including signatures. The Risk Assessment procedure is outlined in Section 7.2.

7.2. Risk Assessment

7.2.1. The Tool Owner contacts the Risk Assessment Team and identifies the risks associated with the work to be performed. The Team will need to identify:

- a) Hazards associated with performing the task.
- b) Control measures to be taken to eliminate or control the hazards.
- c) Tools to be used (e.g., hand, battery, power)
- d) Work methods.
- e) Personal Protective Equipment.
- f) Training required.
- g) Facility/Safety systems affected.
- h) Activities required.
- i) Monitoring requirements.
- j) Supervision.
- k) Notification/posting.
- l) Standing guard.
- m) Maintenance requirements.
- n) Procedures to be complied with.

7.2.2. Upon completion of the assessment, the requestor is responsible for generating the NRHW Permit form, contacting SUNY Poly EHS to identify required signatures, and obtaining all appropriate signatures on the NRHW Permit prior to submitting the Work Authorization Permit at the daily permit meeting.

7.3. The requestor must submit the completed form to SUNY Poly EHS FIVE business days BEFORE the work begins. Permits will be facilitated for emergencies. The completed NRHW Permit Form shall contain signatures from the risk assessment team members and other required signatures prior to submission to EHS.

7.3.1. Any NRHW that involves a physical change to existing system, equipment, or tool, with the exception of an exact replacement, must have P&ID drawings that have been revised, reviewed, and approved prior to the work commencing. All points of lockout/tagout must be specified.

7.4. NRHW Permit Form Routing

7.4.1. Upon obtaining all approval signatures, EHS being the final signature, the requestor will submit the NRHW Permit form, and any other applicable permits to the Work Authorization Permit (WAP) meeting with the WAP form (CFM-00004-F1).

7.4.2. Approved permits shall be posted in the work area during the activity.

NOTE: If workers leave the work area unattended, they must post signage with date and time of work start and completion, and a contact name and phone number.

7.5. Work Permit Closure

7.5.1. The requestor verifies completion of work and removes the posted permit after work has been completed.