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## Non-Routine Hazardous Work Permit Procedure

### REVISION

Rev No.	DCN No.	Change Summary	Release Date	DCN Initiator	Document Owner
11	DCN3344	Refined and updated supervisor section.	March 2024	P. Lafountain	K. Rydberg

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) at the Albany NanoTech Complex (ANC).

## 2. SCOPE

This requirement is applicable to all site employees, students, principal investigators, service engineers, tenants, tool owners, chemical and gas service suppliers, and equipment technicians, including contractors and facility operators who perform NRHW activities on tools and equipment.

## 3. APPLICABILITY

3.1. [This procedure applies to Non-Routine Work](#) activities involving any of the following:

- a) Work that has no pre-approved procedure(s) or work instruction(s) involving Hazardous Production Materials (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/Toxic Metalloids (e.g., antimony, tellurium, gallium, arsenic, phosphorus films) processing unless [previously approved and accepted](#) by EHS.

3.2. If one of the above criteria applies, complete the Non-Routine Hazardous Work Permit ([NRHWP](#)) requirements and/or contact EHS for further guidance, if necessary.

3.3. To eliminate the need for a NRHWP, contact EHS to review any proposal and/or procedures to make the specific work “Routine Work” instead of “NRHW.”

## 4. DEFINITIONS & ACRONYMS

4.1. **Academic** – Relating to or associated with the laboratories, courses, and programs of study.

4.2. **ERT** – Emergency Response Team.

4.3. **Hazard** – A situation that poses a threat to life, health, property, or environment. Hazards include, but are not limited to, the following exposures: extreme temperature, pressure, previously contaminated sub-systems, mechanical, electrical, pneumatic, hydraulic, chemical, or thermal.

- 4.4. **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 (LOTO)** – 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 fabs, buildings (e.g., ZEN), commercial labs, and facilities operations and services.
- 4.7. **Non-Routine Hazardous Work Permit (NRHWP): EHS-00062-F1** – Authorized form 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. **NRHW** – Non-Routine Hazardous Work.
- 4.10. **PPE** – Personal Protective Equipment; used to protect personnel from chemical and physical hazards.
- 4.11. **PPE Assessment** – Personal Protective Equipment assessment, Job Hazard Assessment, or Job Hazard Analysis (see [EHS-00010-F1](#)) is an assessment to determine what PPE is required during a process to protect personnel from chemical and physical hazards.
- 4.12. **Pre-Approved** – A procedure that has been reviewed and approved by a third-party organization, EHS, or is a documented procedure provided by the manufacturer or supplier.
- 4.13. **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.
- 4.14. **Risk Assessment** – A sequential process that identifies the hazards associated with a task and 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 (i.e., PPE Hazard Assessments, Job Hazard Analysis [JHA]).

- 4.15. **Risk Assessment Team** – Consists of an 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 team include representative individuals as follows:
- Cleanroom related activities: Tenant(s) Equipment Engineer(s), Equipment Engineers, Chemical and Gas Services Manager, EHS Representative.
  - Academic experiments/activities: Principal Investigator (PI), Equipment Service Group Manager, Researcher, EHS Representative.
  - Facility activities: Facility Engineering Manager, Facility Engineer, System Owner, Tenant Equipment Engineer, Equipment Engineer, EHS Representative.
- 4.16. **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.
- 4.17. **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 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** is responsible for:
- Following these instructions and completing the NRHW Permit, as necessary.
  - Coordinating the subcontractor's activities, including the action for obtaining a NRHWP.
  - Conducting Risk Assessments on the work task(s)  $\geq$  5 days **prior** to submitting the NRHWP.
  - Contacting EHS to identify approval signatures required on the NRHWP.

- Obtaining a completely signed off NRHWP (**EHS-00062-F1**) prior to submitting the Work Authorization Permit (WAP) and beginning work.
- Verifying safe conditions of tool, equipment, and work area after work has been completed.

5.2. **Management and Supervisors** are responsible for:

- Enforcing all of the requirements of this document by identifying the need for generating and approving the work in advance, so that all employees performing the work are properly trained and aware of the hazards associated with the work.
- Assisting in ensuring that any PPE Assessments are created and reviewed with the employees performing the work in advance of the work.

5.3. **Environmental, Health, and Safety (EHS) Department** is responsible for:

- Identifying approval signatures required on the NRHWP.
- Reviewing the NRHW activities and reviewing completed PPE assessment(s), and NRHWPs.
- Updating this procedure, as necessary.

## 6. ASSOCIATED DOCUMENTS

- 6.1. **CFM-00004** – Instructions for 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** – Workplace Hazard Assessment and 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. PROCEDURE

### 7.1. Risk Assessment

7.1.1. If the work meets the applicability of NRHW, the requestor must contact the Risk Assessment Team specified in Section 4.15 and perform a risk assessment.

7.1.2. The Risk Assessment is conducted prior to the work commencing. This assessment determines the hazards; evaluates the preventive and protective measures needed to reduce risks; and completes the NRHW Permit, including signatures.

7.1.3. The Risk Assessment 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) PPE
- 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) Other required procedures

### 7.2. NRHWP Form

7.2.1. Upon completion of the assessment, the requestor is responsible for generating the NRHWP form, contacting EHS to identify required signatures, and obtaining all appropriate signatures on the NRHWP prior to submitting the WAP at the daily permit meeting.

7.2.2. The requestor must submit the completed form to EHS at least 5 business days prior to the work commencing. Permits submitted < 5 business days prior will be facilitated for emergencies. The completed NRHWP form shall contain signatures from the Risk Assessment Team members and other required signatures prior to submission to EHS.

7.2.3. Any NRHW that involves a physical change to an 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 LOTO must be specified.

### **7.3. NRHWP Form Routing**

7.3.1. Upon obtaining all approval signatures, EHS being the final signature, the requestor will submit the NRHWP form, and any other applicable permits to the WAP meeting with the WAP form (**CFM-00004-F1**).

### **7.4. NRHWP Posting**

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

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

### **7.5. Work Permit Closure**

7.6. The requestor shall verify completion of work and remove the posted permit after work has been completed.