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## New Equipment Installation, Equipment Modification, or Process Change Procedure

### REVISION

Rev No.	DCN No.	Change Summary	Release Date	DCN Initiator	Document Owner
11	DCN1906	Updated information based on new EHS-00016-F1	5-11-20	J. Hellman	T. Diamond

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

## 1. INTRODUCTION

This procedure is [required](#) for use at the [NY CREATES / SUNY Polytechnic Institute \(SUNY Poly\) - Albany site](#) to assist in installing new [or relocated equipment](#) and managing significant changes in process chemistry or physical changes made to tools and/or equipment previously installed and commissioned under this and the **EHS-00017** Equipment Commissioning Procedure.

## 2. PURPOSE

2.1 To ensure that equipment, tools and/or significant changes in process chemistry or equipment configuration are in compliance with applicable codes, regulations and [industry standards](#).

2.2 The New Equipment [Installation or Equipment Modification or Process Change](#) Checklist **EHS-00016-F1** provides a record of each equipment installation and/or significant equipment modification or process chemistry change and the associated review process for [NY CREATES EHS](#) and [FEG](#) offices.

## 3. SCOPE

3.1 This procedure [specifies the](#) requirements for the installation of [equipment](#) and for the addition of significant new or modified chemistries or a physical modification of existing equipment within the facility. The New Equipment [Installation or Equipment Modification or Process Change](#) Checklist **EHS-00016-F1** must be completed for the installation of new [or relocated](#) equipment and for changes or modification that shall be made to tools and equipment previously installed that meet at least one of the following criteria:

- Uses Hazardous Production Materials (HPMs) as defined by the [International Fire Code \(IFC\)](#) and [International Building Code \(IBC\)](#) (solid, liquid, or gas) with [National Fire Protection Association \(NFPA 704\)](#) hazard ratings of 3 or higher.
- Uses or contains [ionizing radiation](#), [non-ionizing radiation](#) or [Lasers](#)
- Has air pollution abatement equipment installed on it.
- Generates wastewater requiring treatment.
- Creates hazardous waste.
- [Has hard wired or hard plumbed facility services](#).

3.2 If this installation and/or modification only involves the addition or removal of any toxic gas monitoring system (TGMS) monitoring points, the applicant must follow requirements outlined in TGMS Operations & Maintenance (O&M) Procedure **EHS-00031**.

3.3 This procedure does not apply to facility only modifications. Those proposing to make facility modifications need to comply with the [Facility Modification or Alteration Safety Sign-off Process \(EHS-00038\)](#).

## 4. DEFINITIONS

The definitions included in the **EHS 00017** - Equipment Commissioning Procedure apply to this procedure, as well as the following:

4.1 **Bulk Chemical Delivery System** - A system that consists of chemical storage vessels located outside of the fabrication area from which chemicals are delivered, via distribution piping, to equipment located in the fabrication area [or subfab](#).

4.2 **Equipment Owner** - As it relates to this procedure, the Equipment Owner is the person who owns/purchased the tool and is listed as the "Applicant" on the **EHS-00016-F1**, [New Equipment Installation or Equipment Modification or Process Change Checklist](#). In the event that a more appropriate party exists, it shall be the responsibility of the "Applicant" to designate the person who will fulfill the responsibilities of the [Equipment Owner](#) during the installation process.

4.3 **Hazardous Production Materials (HPM)** - A solid, liquid, or gas that has a degree-of-hazard rating in health, flammability, or reactivity of Class 3 or 4 [as ranked by the National Fire Protection Association (NFPA 704)] and is used directly in research, laboratory or production processes that have as their end products, materials that are not hazardous.

4.4 **Local Dispense Chemical Delivery System** - A local dispense chemical is one that is stored in and/or dispensed from a vessel that is internal to the equipment or is delivered to the equipment from storage vessel(s) located in a dispensing cabinet that is remote from the equipment but located within the fabrication area.

4.5 **Non-HPM** - A solid, liquid or gas that has a degree-of-hazard rating in health, flammability, or reactivity of Class 0, 1 or 2 [as ranked by the National Fire Protection Association (NFPA 704 – 2007)]. Non-HPM chemicals are those that pose minimal, if any, hazards to personnel who may be exposed to them. They are the only chemicals that may be introduced to the equipment after Part 1 of the Equipment Commissioning [Inspection Record \(EHS-00017-F1\)](#) has been signed off.

- 4.6 **Significant changes in process chemistry** - A change in the type of or hazard level of chemicals or gases utilized in an existing equipment that results or may result in a need to increase the level of ambient air monitoring or a change in the method of air pollution control. (An example would be the use of an HPM chemical/gas in a tool which previously only utilized inert gases and had no air pollution control device installed or a tool that used a material at a concentration of 5% now needed to use a concentration of 25%).
- 4.7 **Significant increases in previously approved HPM use** – An increase in use of HPM gases or chemicals in excess of 20% above previously approved and permitted levels would be considered significant. This would require review of the corresponding air pollution control equipment capacity, as well as the exhaust air flow capacity.
- 4.8 **Significant changes in process equipment** – A change in equipment configuration (including addition of process modules beyond what was initially approved), increased input or output potential (resulting in increased power consumption or exhaust flow), addition of an air pollution control device due to a change in process chemistry (resulting in increased energy consumption, exhaust air flow, water utilization and industrial drain connections), or other physical changes in operation.

## 5. ASSOCIATED DOCUMENTS

- 5.1 **EHS-00016-F1** – [New Equipment Installation or Equipment Modification or Process Change Checklist](#)
- 5.2 **EHS-00017-F1** – [Equipment Commissioning Inspection Record](#)
- 5.3 **EHS-00066-F2** – Radiation Device Inventory
- 5.4 **EHS-00066-F3** – Radiation Survey Sheet
- 5.5 **EHS-00066-F4** – Non-Ionizing Radiation Source Equipment Inventory
- 5.6 **EHS-00066-F5** – Laser Inventory [Form](#)
- 5.7 **EHS-00066-F6** – Radiation Sealed Source Inventory
- 5.8 **EHS-00066-F7** – Non-Ionizing Radiation Survey Sheet

## 6. RESPONSIBILITIES

- 6.1 The tenant, [equipment engineer](#), or equipment owner requesting permission to install [or relocate](#) equipment and/or modify or add new chemicals or gases to existing [equipment](#) on the [NY CREATES /SUNY](#)

Poly - Albany site must complete the [New Equipment Installation or Equipment Modification or Process Change Checklist](#), **EHS-00016-F1**.

- 6.2 The person completing the **EHS-00016-F1** checklist is responsible to ensure all questions have been answered completely and to take additional actions based on the checklist instructions (i.e., completion of additional forms, attaching additional information as requested). The designated [NY CREATES / SUNY Poly](#) personnel will review the checklist and required documentation. [When approval has been granted](#) to begin the installation and/or modification or change process [NY CREATES EHS](#) will inform the applicant.
- 6.3 The groups to be represented on the Equipment Installation Approval Sign-off are as follows:
- [Equipment Owner \(EO\)](#)
  - [Equipment Engineer \(EE\)](#)
  - [Equipment Owner or Engineer's Supervisor or Manager](#)
  - [Process Engineer's Supervisor or Manager](#)
  - [System Owner: Bulk Gases/Chemicals \(if chemical/gas change\)](#)
  - [SUNY Poly Waste Water Engineer](#)
  - [SUNY Poly Tool Hook-up Project Manager](#)
  - [SUNY Poly EHS Environmental Engineer](#)
  - [SUNY Poly EHS Safety Equipment Engineer](#)

Approval signatures indicate that each individual has reviewed the **EHS-00016-F1**.

## 7. PROCEDURE

The [New Equipment Installation, Equipment Modification, or Process Change Procedure](#) guides the involved [equipment owner](#) and assigned personnel through a review of the [equipment installation and/or proposed installation design or chemical change](#) prior to the change, as well as, allowing for periodic reviews prior to and during the installation/change. These reviews provide an opportunity for involved personnel to verify that required elements are in place prior to the start of the [new equipment installation or equipment modification or process change](#) and prior to [starting or re-starting the equipment](#).

The [New Equipment Installation or Equipment Modification or Process Change Checklist](#) informs [NY CREATES / SUNY Poly groups](#) of the [proposed installation or change](#). This allows for aid in identifying deficiencies in the design pre-installation phase.

The [New Equipment Installation or Equipment Modification or Process Change Checklist](#), must be approved by [NY CREATES EHS](#) prior to any

changes taking place. NY CREATES EHS will inform the applicant when the New Equipment Installation or Equipment Modification or Process Change is approved and will assign a Safety Equipment Engineer to oversee the installation or change.

## 7.1 General Information

7.1.1 The first page of the New Equipment Installation or Equipment Modification or Process Change Checklist requires General Information. This information is intended to provide a *quick* reference to the information regarding the equipment being installed:

## 7.2 General Safety

This section requires information on the documentation required in ensuring that the equipment has been evaluated to operate in a safe manner. In general, the equipment shall either be listed, or labeled by a nationally recognized testing laboratory (NRTL) or a SEMI S2 review has been performed by a third party. If neither of these has been done for the equipment, a meeting with a SUNY Poly Safety Equipment Engineer must be scheduled to determine if the equipment will be allowed to be installed.

Peripheral equipment must also have either SEMI S2 review or NRTL label or listing. Any installations, modifications, or process changes that result in additions or changes to TGMS monitoring will require that a new TGMS matrix is submitted for approval.

### 7.2.1 Equipment Design Requirements

A. Equipment must meet all relevant federal (e.g., OSHA Title 29 CFR Part 1910), and state (e.g., building, fire codes), codes, and regulations.

*One of the following methods shall be used:*

1. With respect to semiconductor equipment and equipment components that are compliant with applicable SEMI standards (e.g., SEMI S2, S8, S14, S22). This includes but is not limited to VMBs, GIB assemblies, gas cabinets, chemical distribution units, safety interlocks, and emergency shutdown capability.

**NOTE:** A complete copy of the SEMI S2 and S8 written report of the equipment's compliance and/or non-compliance with the applicable SEMI standards must be submitted to NY CREATES EHS. Any non-compliance issues must be addressed and closed in writing by the third party providing the report, PRIOR to the equipment being turned on.

2. It is accepted, certified, listed, labeled, or otherwise determined to be safe by a nationally recognized testing laboratory
  3. With respect to an installation or equipment of a kind that no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe: if it is inspected or tested by another Federal agency, or by a State, municipal, or other local authority responsible for enforcing occupational safety provisions of the National Electrical Code, and found in compliance with the provisions of the National Electrical Code as applied in the OSHA Subpart S
  4. With respect to custom-made equipment or related installations that are designed, fabricated for, and intended for use by a particular customer, if it is determined to be safe for its intended use by its manufacturer on the basis of test data which the employer keeps and makes available for inspection to OSHA and OSHA-authorized representatives
- B. **NOTE:** The 'CE mark' is not accepted by OSHA. Products that bear only non-NRTL certification marks (including the CE mark) do not meet any OSHA standard requiring NRTL approval of the product.

### 7.3 Radiation

This section is intended to inform the Radiation Safety Officer (RSO) or Laser Safety Officer (LSO) of any equipment that will be installed or modified that contains ionizing radiation producing devices, non-ionizing radiation producing devices, or lasers that are Class 2, 3, or 4.

If any equipment that produces ionizing radiation (including X-ray equipment and electron microscopes) is installed or modified, an **EHS-00066-F2** must be submitted to the RSO prior to **EHS-00017-F1** approval.

If any equipment that produces non-ionizing radiation (including RF, microwave, magnetic, UV, IR) is installed or modified, an **EHS-00066-F4** must be submitted to the RSO prior to **EHS-00017-F1** approval.

If any equipment that contains Class 2, 3, or 4 lasers is installed or the lasers are modified or replaced, an **EHS-00066-F5** must be submitted to the LSO prior to **EHS-00017-F1** approval. All equipment installed in the cleanrooms and the Subfabs must be classified no higher than a Class 1 laser product.

### 7.4 Facility Services

This section is intended to inform the Tool Hook-up Project Manager of any equipment that will be installed or modified that requires new or

upgraded facility services. It states what exhaust systems will be utilized. If the equipment installation or modification does require new or upgraded facility services, then a P&ID will be required to be issued and the tool commissioning process using the **EHS-00017-F1** will be required. Signatures will be required to be obtained from the Tool Hook-up Project Manager.

## 7.5 Chemicals and/or Gases

This section is intended to inform EHS, System Owner: Bulk Gases/Chemicals, and the SUNY Poly Waste Water Engineer of any new chemicals/gases to be utilized in the equipment. It will also inform these people of the effect of the use of those chemicals/gases on bulk system demands, waste water, and waste chemical disposal. Addition of or changes to chemicals/gases may require the approval of the System owner of the Bulk Gases/Chemicals and the SUNY Poly Waste Water Engineer. Changes to bulk supplied chemicals or gases will require an **EHS-00017-F1** to be completed and approved and may require a new P&ID and a new TGMS matrix to be approved.

For additions or significant changes to chemicals or gases to a piece of equipment, EHS requires submission of the chemical/gas to HAZMIN. The chemical/gas will not be approved until the **EHS-00016-F1** has been approved, a SEMI S2 document of the tool has been submitted to EHS for Semi equipment, and a request has been placed into HAZMIN.

## 7.6 Signature Blocks

After the form has been completed, obtain the Approval Signatures as required prior to delivering the form to EHS. Contact EHS Safety Equipment Engineer if you are not sure if a signature is required. After NY CREATES EHS has approved the **EHS-00016-F1** you will be notified that the form has been approved. If the **EHS-00016-F1** is only for chemical or gas change, you will be notified by the HAZMIN system that it has been approved. For any new installations or modifications to equipment, EHS will assign a Safety Equipment Engineer to that equipment and the engineer will notify you that the **EHS-00016-F1** has been approved.

## 8. RECORDS

The New Equipment Installation or Equipment Modification or Process Change Checklist serves as documentation of the individual equipment installation projects and will be archived for future reference by NY CREATES EHS.