

INDIANA UNIVERSITY-PURDUE UNIVERSITY AT INDIANAPOLIS
LABORATORY SAFETY POLICY

Subject: Policy for Servicing Fume Hood Exhaust Systems

Effective Date: 5/1/2008

Approved: Laboratory Safety Committee

Policy: 106

PURPOSE AND BACKGROUND:

The following policy was developed to protect the Campus Facility Services personnel (CFS) and the IUPUI laboratory occupants from potential exposure to hazardous materials while servicing exhaust systems.

SCOPE:

This policy applies to all work that requires servicing and repairing or dismantling of a chemical fume hood, entering or removing duct work, entering the fan housing, changing filters, shutting off fans or any other maintenance that requires entering the inside of the exhaust system.

Special precautions are usually not required when servicing equipment that is outside of the chemical fume hood cabinet and/or outside of the potentially contaminated air stream. For example, belts and pulleys may be serviced, vibration isolators may be adjusted and lamps may be replaced on many chemical fume hoods without entering the interior of the hood or exhaust duct.

POLICY:

The following procedures will be followed when performing maintenance and/or repairs inside of a fume hood or inside the fume hood exhaust system and when shutting down a fume hood for scheduled or unscheduled maintenance and/or repairs.

PROCEDURES:

Procedure Components

1. Responsibilities
2. Special Operating Procedures
3. Procedures for Servicing a Chemical Fume Hood
4. Procedures for Servicing a Dedicated Exhaust System Fan
5. Procedures for a Shutdown of Multiple Chemical Fume Hoods
6. Maintenance Procedures
7. Unscheduled Shutdown Procedures

1. Responsibilities :

Campus Facility Services

- When service requires that a chemical fume hood or other local exhaust system be shut down, CFS personnel must communicate to the laboratory personnel and/or the Principle Investigator (PI) the need for service and obtain permission to shut down the chemical fume hood and/or the local exhaust system. CFS personnel must also enter a shut down notice to communicate the time and duration of the shut down. If responsible laboratory personnel and/or PI are not available, contact the building manager or department administration to obtain permission to shut down the chemical fume hood or other local exhaust system.
- CFS personnel must not shut down the chemical fume hood or local exhaust systems without permission from an authorized person.
- CFS personnel must complete and post a Shut Down Notice on the sash of the chemical fume hood a minimum of 3 days before the scheduled shut down. Work should not begin if laboratory personnel or PI have not completed the checklist on the Shut Down Notice.
- CFS personnel should contact Radiation Safety if radioactive materials have been used in the hood a minimum of 48 hours before shutdown.
- CFS personnel should contact Environmental Health and Safety (EHS) if any unusual hazards have been used in the hood a minimum of 48 hours before shutdown.
- If work requires entry into the fume hood then CFS should not begin work until all hazardous chemical in the chemical fume hood have been removed and equipment in the hood secured or removed. CFS personnel shall not alter, move or remove laboratory chemicals or equipment.
- CFS personnel must perform work in a manner consistent with established CFS safety procedures and wear the appropriate personal protective equipment (see Section 6 Maintenance Procedures).

Laboratory Supervisor and/or PI

- When work must be done inside of the exhaust system, the laboratory personnel and/or PI must confirm that the sash is shut, hazardous materials are closed and secure and the fume hood will not be used for the duration of the service work.
- The laboratory personnel or PI must confirm if any radioactive materials or unusual hazards have been used in the hood by completing and signing the Laboratory Personnel checklist section on the maintenance notice a minimum of 48 hours before shutdown.
- As appropriate, the laboratory personnel and/or PI must provide a work area in the laboratory that is cleared of laboratory chemicals and equipment. CFS personnel shall not alter, move or remove laboratory chemicals or equipment.

Environmental Health and Safety

- EHS personnel will inspect the fume hood and/or ductwork before CFS begins work if any unusual hazards have been used or if CFS personnel have reason to believe that unusual hazards may exist.

Radiation Safety

- If radioactive materials have been used in the fume hood, Radiation safety personnel will perform surveys of the work area to verify lack of radioactive contamination.

2. Special Operating Procedures

- **Radioisotope Hoods.** If work is scheduled for a chemical fume hood inside a laboratory posted with a "Caution Radioactive Materials" sign and/or when laboratory personnel have indicated that radioactive materials have been used in the hood on the Shut Down Notice, CFS personnel will contact Radiation Safety and request a survey to verify that the work area contamination is below applicable limits. If contamination is below applicable limits proceed as outlined in Section 6 Maintenance Procedures. If contamination is above the applicable limits, the IUPUI Radiation Safety staff will specify the special procedures to be followed. Once the hood has been cleared for service, Radiation Safety staff will inform CFS that the contamination has been removed and they are safe to proceed.
- **Perchloric Acid Hoods.** If work is scheduled for a perchloric acid hood the system will be tested for the presence of perchlorates by EHS staff. If perchlorates are not present or are present at acceptable levels, proceed as outlined in Section 6 Maintenance Procedures. If perchlorates are present at greater than acceptable levels, EHS will work with CFS to modify the procedure to stabilize the perchlorates.
- **Biological Safety Cabinets.** CFS personnel must not work inside contaminated spaces of a biological safety cabinet such as the plenum, blower, or high efficiency particulate air filter (HEPA) compartment, CFS personnel should contact the IUPUI Biological Safety Manager at 274-2830 if requested to service a biological safety cabinet
- **Heat Recovery Coils.** Work to be scheduled for heat recovery coils should follow the guidelines as outlined in Section 6 Maintenance Procedures. If the heat recovery coil work involves interrupting/reducing airflow to exhaust systems servicing research facilities, the applicable procedures as outlined in Section 4 Procedures for Servicing a Dedicated Exhaust System Fan and Section 5 Procedures for a Shutdown of Multiple Chemical fume hoods shall be followed. Prefilters must be carefully removed and sealed in heavy polyethylene bags.

3. Procedures for Servicing a Chemical Fume Hood

- When a chemical fume hood is suspected of not functioning properly, the CFS office should be notified immediately at 278-1900. In order to avoid inadvertent use of the chemical fume hood, CFS will post a Shut Down Notice on the sash of the fume hood. The notice should be posted in the lower, center area of the sash so that it is easily visible.
- It is the responsibility of the laboratory personnel and/or PI to ensure that the chemical fume hood is prepared prior to maintenance by CFS. If work by CFS is required to be performed on the inside of the chemical fume hood, the laboratory personnel and/or PI must ensure the removal of all hazardous materials and equipment. If necessary, the laboratory personnel and/or PI are responsible for the

decontamination of the interior of the chemical fume hood. All residues must be cleaned from the walls, the work surface, and the sash of the chemical fume hood with an appropriate solvent or cleaning solution. EHS (274-2005) may be consulted regarding appropriate decontamination procedures.

- If work is required in the hood CFS personnel will verify that all chemicals have been removed from the hood and equipment secured inside the hood before they begin work inside of the hood. The laboratory personnel and/or PI will complete the Laboratory Personnel checklist found on the Shut Down Notice a minimum of 48 hours before work begins.
- Once the service is completed, EHS personnel will perform an airflow check with a calibrated (e.g., Alnor) hand-held portable meter to confirm that the chemical fume hood is functioning properly (currently the airflow check by EHS is not conducted for fan belt replacements or filter changes). If the chemical fume hood is functioning within the campus guidelines, the Shut Down Notice will be removed and a new chemical fume hood inspection sticker will be applied by EHS.
- If the chemical fume hood repair is determined to be beyond the scope of services available through CFS or if the airflow check indicates inadequate airflow, the Shut Down Notice will be updated to reflect the new maintenance schedule and once again be posted on the chemical fume hood. It is CFS's responsibility to follow-up with the laboratory personnel and/or PI and the affected department's administration to make sure the user understands the problem identified and the options available for repair.

4. Procedures for Servicing a Dedicated Exhaust System Fan

These procedures shall be followed when a dedicated exhaust fan serves a chemical fume hood or a small number of ganged chemical fume hoods **within one laboratory**.

- CFS will communicate to the laboratory personnel and/or PI the need for service and the duration of the fan shut down and enter a shut down notice into the system.
- CFS will obtain permission to shut down the chemical fume hood(s) and/or the local exhaust system at an agreed upon date and time.
- Except for emergency situations, CFS personnel will post the Shut Down Notice on the affected chemical fume hood(s) a minimum of three days prior to the scheduled shutdown. The notice should be posted in the lower, center area of the sash so that it is easily visible. The affected hood(s) will be out of service during the period indicated on the notice regardless of whether or not the fan is actually operating.
- The laboratory supervisor and/or PI must ensure that hazardous materials have been secured, the sash remains closed and no operations/experiments, including closed systems, shall be conducted in the chemical fume hood(s) for the duration of the maintenance as indicated on the posted notice.

- CFS personnel will verify that all chemicals and equipment have been secured or removed from the hood and the Laboratory Personnel section of the Shut Down Notice has been completed before maintenance work begins.
- If the fan to be worked on is located near hood exhaust stacks, which do not have a 7 to 10 ft. extension, those fans must also be turned off. If this is not possible, CFS personnel must wear an appropriate respirator and safety goggles or PAPR as recommended by EHS.
- Once the service is completed, EHS personnel will perform an airflow check with a calibrated (e.g., Alnor) hand-held portable meter to confirm that the chemical fume hood is functioning properly (currently the airflow check by EHS is not conducted for fan belt replacements and filter changes). If the chemical fume hood is functioning within the campus guidelines, the "Shut Down Notice" will be removed and a new chemical fume hood inspection sticker will be applied by EHS.
- If the airflow confirmation indicates that there is inadequate airflow, the Shut Down Notice will be updated to reflect the new maintenance schedule and remain in place on the chemical fume hood. It is CFS's responsibility to follow-up with the laboratory supervisor and/or PI and the affected department's administration to make sure the user understands the problem identified and the options available for repair.
- Any questions should be directed to the CFS personnel listed on the notice at the number provided.

5. Procedures for a Shutdown of Multiple Chemical Fume Hoods

When maintenance work on a chemical fume hood fan is required, it may be necessary to schedule a shutdown of an entire bank of hoods.

- CFS will contact and communicate with the administration of the affected department(s) to confirm shutdown dates and times and enter a shut down notice into the system.
- The department administration will notify the affected researchers of the need for the fan maintenance and the date and time the fan maintenance will occur.
- Except for emergency situations, CFS personnel will post the Shut Down Notice on the affected chemical fume hood(s) a minimum of three days prior to the scheduled shutdown. The notice should be posted in the lower, center area of the sash so that it is easily visible. The affected hood(s) will be out of service during the period indicated on the notice regardless of whether or not the fan is actually operating.
- For fume hoods posted with the Shut Down Notice the laboratory personnel and/or PI must ensure that hazardous materials have been secured, the sash remains closed and no operations/experiments, including closed systems, shall be conducted in the chemical fume hood for the duration of the maintenance as indicated on the posted notice.
- CFS personnel will verify that all chemicals and equipment have been secured or removed from the hood and the Laboratory Personnel section of the Shut Down Notice has been completed before maintenance work begins.

- If the fan to be worked on is located near hood exhaust stacks, which do not have a 7 to 10 ft. extension, those fans must also be turned off. If this is not possible, CFS personnel must wear an appropriate respirator and safety goggles or PAPR as recommended by EHS.
- Once the service is completed, EHS personnel will perform an airflow check with a calibrated (e.g., Alnor) hand-held portable meter to confirm that the chemical fume hood is functioning properly (currently the airflow check by EHS is not conducted for fan belt replacements). If the chemical fume hood is functioning within the campus guidelines, the Shut Down Notice will be removed and a new chemical fume hood inspection sticker will be applied by EHS.
- If the airflow confirmation indicates that there is inadequate airflow, the Shut Down Notice will remain in place on the affected chemical fume hood. It is CFS's responsibility to follow-up with the laboratory supervisor and the affected department's administration to make sure the user understands the problem identified and the options available for repair.
- Any questions should be directed to the CFS personnel listed on the notice at the number provided.

6. Maintenance Procedures

- Disposable nitrile gloves, chemical splash goggles and chemical resistant coveralls (Tyvek™) should be worn if there is a potential for contact with internal chemical fume hood/local exhaust components. Where exhaust systems are suspected of being pressurized an appropriate respirator and chemical splash goggles or PAPR shall be worn to prevent exposure to potentially contaminated exhaust air.
- If cleaning internal chemical fume hood surfaces with all-purpose cleaners (e.g., Soilax®, TSP) wear long length chemical resistant reusable gloves with folded cuffs, chemical splash goggles and chemical resistant coveralls (Tyvek™).
- When working around sharp objects like sheet metal, wear appropriate outer work gloves in addition to inner disposable nitrile gloves. If the outer work gloves are suspected of being contaminated they shall be disposed of at the completion of each workday.
- When performing work near hood exhaust stacks, which do not have a 7 to 10 ft. extension, arrangements should be made to shut down the associated exhaust fans for the duration of the work. If this is not possible, CFS personnel must wear an appropriate respirator and safety goggles or PAPR as recommended by EHS.
- Do not eat, drink, or apply cosmetics or medication while in the laboratory.
- Do not touch, move or handle containers of any chemicals or materials in a laboratory. If containers or equipment need to be moved, ask the laboratory supervisor to relocate them.
- After work is completed, the nitrile gloves should be discarded and hands should be washed with soap and water.
- Personal hygiene is important. Hands should always be washed with soap and water at the completion of any work.

7. Unscheduled Shut Down

- CFS personnel will post the Emergency Shut Down notice and close the sash on all affected fume hoods when an unscheduled shut down occurs.
- The procedures outlined in this policy will be followed when completing the repairs.