



West Virginia University

Environmental Health and Safety

INDUSTRIAL HYGIENE PROGRAM

Revised – May 2015

**WEST VIRGINIA UNIVERSITY
OFFICE OF ENVIRONMENTAL HEALTH AND SAFETY**

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1. Purpose

WVU Environmental, Health and Safety (EHS) has developed and implemented a standardized, systematic process to anticipate, recognize, evaluate, and control workplace exposures to occupational hazards such as chemical, biological, and physical agents and to manage data related to employee exposures to these hazards. The goal of this program is to ensure the health of all West Virginia University faculty, staff and students by conducting an evaluation of the following, and to provide guidance for corrective actions when appropriate:

- An employee's potential exposures to occupational hazards,
- The effectiveness of exposure control devices and/or measures,
- Processes and/or tasks that could result in workplace exposures to occupational hazards,
- The impact of employee exposure resulting from changes in procedures, processes, equipment or materials, and
- Compliance with established occupational exposure limits.

2. Scope

This standard applies to all WVU campuses with the potential for workplace exposures that may cause sickness, impaired health, and/or significant discomfort among employees. Industrial hygiene assessments and studies shall be conducted under the direction and oversight of the WVU Environmental Health and Safety Department. Assessments will be conducted by, or under the supervision, of the WVU Industrial Hygiene section of EHS.

3. Definitions

Action Level – A concentration designated in 29 CFR part 1910 for a specific substance, calculated as an eight (8)-hour time-weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance. The action level is usually at 50% of the exposure limit established by a regulatory authority. For noise exposure, action levels are set at 85 dBA. Where no exposure limit exists, exposures will be maintained as low as reasonably achievable with consideration for known information regarding the potential hazards for the substance and how it is used.

Administrative Controls – A method of controlling employees' exposure by changes made to work procedures, such as written safety policies, rules, supervision, and training, with the goal of reducing the duration, frequency, and/or severity of exposure to occupational hazards.

Control Measures- Actions taken to minimize or eliminate potential occupational hazard exposures. Control measures include one or more of the following: Engineering controls, Administrative controls and Personal Protective Equipment (PPE).

Decibel 'A' scale (dBA) – The measurement of sound level as measured on the A scale of a sound level meter. The A-weighted scale simulates the sensitivities of the human ear to moderate frequency noise.

Engineering Controls – Actions taken to eliminate or reduce exposure to occupational hazards through the use (or substitution) of engineered machinery or equipment.

Industrial Hygiene (IH) – The discipline devoted to anticipation, recognition, evaluation, and control of those environmental factors and stresses associated with work and work operations that may cause sickness, impaired health and/or significant discomfort.

Industrial Hygiene Exposure Monitoring – The measurement of an individual's or similar exposure group's exposure to a chemical, physical or biological agent.

Noise – Unwanted sound that is occurring in the worker's environment that is annoying, distracting/harmful, and prohibits communication with co-workers.

Personal Protective Equipment (PPE) – Includes all clothing and other work accessories designed to create a barrier against workplace hazards. Examples include: safety goggles, hard hats, blast shields, hearing protection, gloves, respiratory protection, aprons and steel-toed boots.

Physical Agent – Any acoustic vibration (i.e. physical vibration and noise), heat, cold, and ionizing (i.e. x-rays and radioactive materials) and non-ionizing (i.e. radio-frequency, lasers) radiation.

Occupational Safety and Health Administration (OSHA) – the governing body in the United States responsible for establishing and enforcing occupational safety and health regulations. OSHA is housed in the US Department of Labor.

Permissible Exposure Limit- a legal limit for exposure of an employee to a chemical substance or physical agent. PEL's are established by OSHA.

Risk Assessment (RA) – A comprehensive, qualitative evaluation of the work environment to identify potential employee exposures to chemical, physical, or biological agents that may exceed regulatory exposure limits, thus requiring exposure monitoring and/or control.

Time Weighted Average (TWA)- An exposure to a substance averaged over a period of time; usually 8 hours.

4. Roles & Responsibilities

The Industrial Hygiene Program roles and responsibilities are identified in the following sections and play an important role in safety at WVU. The success of the program relies on the WVU employees adhering to and following the procedures outlined in this program.

4.1 Environmental Health and Safety (EHS) Shall:

- Develop the written Industrial Hygiene Program and revise the program as necessary.
- Define the goals, expectations and metrics for the Industrial Hygiene Program.

- Recommend improvements necessary to improve facility operations which minimize employee exposure to occupational hazards.
- Conduct Industrial Hygiene risk assessments and monitoring studies, while communicating the results to appropriate members of personnel at WVU.
- Educate management on the requirements of the Industrial Hygiene program.
- Oversee the implementation of the policy and standard.
- Provide technical support to assist others with implementation.
- Assist with development of facility action plans to address deficiencies identified by Industrial Hygiene assessments and monitoring.
- Ensure Industrial Hygiene monitoring data is maintained for long term preservation.

4.2 Deans/Directors, Managers and Supervisors Shall:

- Implement the policy and standard at the facility/department level.
- In conjunction with EHS, establish specific goals and metrics to reduce employee exposure to occupational hazards.
- Request technical assistance as necessary from WVU EHS.
- In conjunction with EHS, develop a strategy to address deficiencies identified by IH assessments or exposure monitoring.
- Implement corrective actions as needed to reduce employee exposures.
- Ensure employees understand their responsibilities and know the location of the Industrial Hygiene Program.
- Maintain frequent and open communication regarding the implementation of the Industrial Hygiene Program with EHS.
- Notify EHS of process changes such as equipment and materials.

4.3 Employees

- Utilize control measures (i.e., PPE, ventilation, etc.) properly and as required.
- Follow established rules and operating procedures.
- Suggest improvements to existing work practices to reduce occupational hazard exposures.
- Review and understand the requirements and responsibilities of the Industrial Hygiene Program.
- Participate in Industrial Hygiene monitoring as requested.
- Report conditions that may cause exposure to occupational hazards.

4.4 Occupational Medicine

Depending on results of exposure monitoring, Occupational Medicine services may be needed. Specific roles will depend on the type of exposure.

5. General Requirements

5.1 Process Overview for Air Contaminants

The Industrial Hygiene process begins with an Industrial Hygiene Risk Assessment (RA) to determine if there are potential employee exposures to chemical, physical, or biological agents above regulatory exposure limits. The findings of the Risk Assessment may indicate that exposure monitoring and/or controls may be necessary. If the Risk Assessment reveals the potential for one or more employees to be exposed at or above regulatory exposure limits, then a formal Industrial Hygiene Exposure monitoring study will be performed to measure employee's actual exposure level. Time to perform the formal Industrial Hygiene Exposure monitoring may vary based on scheduling and availability of sampling media.

5.2 Risk Assessments

An IH Risk Assessment will be conducted to determine if a more detailed exposure investigation, or exposure monitoring, is necessary.

The purpose of the Risk Assessment is to estimate the general risk of the employee's occupational hazard (chemical/physical/biological agent) exposure, given the relevant exposure controls in the workplace. The Risk Assessment report will provide documentation of estimated exposures (by job function) to specific chemicals, physical and biologic agents present in the work environment, and a recommended exposure monitoring protocol.

The key components of the IH Risk Assessment are:

- A review of the chemical/hazardous material inventory and related Safety Data Sheets.
- An observation of the chemical, physical and biological agent exposure hazards in the workplace.
- An observation of the employee work processes, jobs, and tasks conducted.
- A survey of any employee occupational health complaint or symptom.
- An estimate of employee exposure levels, based on worst case and normal exposure conditions.
- A review of work/process flow diagrams.
- Collecting screening samples, if appropriate (i.e. grab samples or area samples with a real time electronic or other monitoring device).
- Documentation of methods used to collect screening samples and the results.
- Recommendation(s) of any necessary specific exposure monitoring.

5.3 Industrial Hygiene Exposure Monitoring

The type of exposure monitoring to be performed will be based on the IH Risk Assessment. Initial employee exposure monitoring will first target the most highly exposed employee or group of employees (i.e. employees at greatest risk), and if deemed necessary conduct further monitoring on additional employees.

If the initial Industrial Hygiene Exposure Monitoring study indicates employee exposures are greater than the established regulatory limits, then the facility must implement control measures to reduce the employee's exposures to below the regulatory limits. Industrial Hygiene unit will evaluate the effectiveness of the controls and determine if additional monitoring should be conducted.

5.4 Occupational Exposure Limits

All areas will adhere to occupational exposure limits. Where no recommended exposure limit exists, exposures will be maintained as low as reasonably achievable with consideration for known information regarding the potential hazards of the substance and how it is used.

When an exposure exceeds the regulatory limit, a corrective action plan must be developed to mitigate the exposure, see Section 5.7 for more details.

5.5 Reports

A formal report will be issued for each Industrial Hygiene Risk Assessment and also each Exposure Monitoring study. Reports must be reviewed and a corrective action plan determined, as appropriate. Exposure monitoring reports can take several weeks to prepare if samples need to be sent to a laboratory for analysis. The typical turn-around time for laboratory analysis is 5-7 business days. If a report needs expedited, please notify the EHS department. Requests for expedited reports will be evaluated on a case by case basis.

5.6 Employee Notification of Monitoring Results

Employees must be notified in writing of their exposure monitoring results, regardless of their exposure level. Notification must be made within fifteen calendar days of the receipt of sampling results, or sooner if there is a regulatory requirement that specifies earlier notification. Notification to a terminated employee must be mailed to the home address, via certified mail, with a return receipt requested.

5.7 Corrective Action Plans

With collaboration of EHS each area must develop a documented corrective action plan for each exposure identified above a regulatory limit, as determined by exposure monitoring. Corrective action plans must include a timeline for corrective actions, and steps to be taken to reduce or eliminate the exposure. These steps may include, but not be limited to, isolation of a process or operation, substitution of materials, alteration of a process, safe guards and/or the use of Personal Protective Equipment.

Corrective action plans must include provisions for further monitoring to ensure corrective actions have been effective.

5.8 Industrial Hygiene Data and Reports

Industrial Hygiene monitoring data will be centrally managed by WVU EHS. Industrial Hygiene studies or exposure monitoring performed by any entity must be sent to EHS. All Industrial Hygiene monitoring to be performed must be authorized by the Industrial Hygiene section of WVU EHS.

5.9 Control Measures

If results from Industrial Hygiene monitoring indicate exposures are above a regulatory limit, the facility must immediately implement appropriate exposure controls to reduce employee exposure below the regulatory limits. After the controls are implemented, additional monitoring must be conducted to ensure employee exposures are below the regulatory limits (see Section 5.3). The actions taken must be documented. Exposure controls related to Industrial Hygiene will be implemented according to the following hierarchy of control:

- **Engineering Controls** are the most preferred control option to eliminate the exposure by changing the process/chemical or substituting a process/chemical that does not pose a hazard. Other engineering controls implemented to reduce the concentration or intensity of an agent include ventilation, isolation, and/or enclosure of the hazardous agents.
- **Administrative/Work Practice Controls** are controls used while engineering controls are being developed and implemented. Controls include specific work practices, such as reduced work times/scheduling, and employee training. These controls should be designed to reduce employee exposure below the Action Level.
- **Personal Protective Equipment** is the least preferred control method, and can include gloves, respirators, etc. PPE does not affect the concentration/intensity or duration of employee exposure but it may provide a barrier between the agent and the employee. PPE can be used in conjunction with engineering and administrative controls. Employees must be provided with the appropriate PPE to protect them from the hazards, trained on how to properly use the PPE, and evaluated to ensure the PPE fits/works appropriately.

5.9.1 Personal Protective Equipment (PPE)

PPE will be decided depending on the findings of the Industrial Hygiene Exposure Monitoring. If there are specific questions regarding PPE, please refer to the WVU EHS PPE Program, located on WVU EHS website: ehs.wvu.edu.

6. Recordkeeping

Employee exposure results will be retained for the duration of employment plus 30 years, or longer if required by law. These results include all Industrial Hygiene reports, as well as, documentation of the employee's notification of results.

Records shall be provided upon request to employees, former employees, representatives appointed by the individual employee, and the OSHA Assistant Secretary.

7. References

- National Institute for Occupational Safety and Health (NIOSH) Occupational Exposure Sampling Strategy Manual.
- Occupational Safety & Health Administration (OSHA).

8. Program Review

EHS will coordinate a review of the program every three years, or as necessary.

9. Program Revisions

This program is original and will be subject for review in 2018.

10. Approval Signature