REQUIREMENT MATRIX

The following matrix outlines the requirements for each group:

Group	Risk Assessment	SOP/Guideline Development	SOP/Guideline Training
Group 3	Prior to ordering or purchasing	Prior to ordering or purchasing	Prior to ordering or purchasing
Group 2	Prior to use	Prior to use	Prior to use
Group 1	Not applicable	Not applicable	Prior to use

2.10.3 Chemical Facility Anti-Terrorism Standard (CFATS)

The U.S. Department of Homeland Security (DHS) has issued a Standard that imposes federal security regulations for high-risk chemical facilities. This rule establishes risk-based performance standards for the security of the nation's chemical facilities and requires chemical facilities to prepare Security Vulnerability Assessments that identify security vulnerabilities at the facility and develop and implement Site Security Plans that include measures that satisfy the identified risk-based performance standards.

In order to determine if your facility meets the criteria for a high-risk chemical facility, the chemical inventories on campus must be reviewed. If the University manufactures, uses, stores or distributes any chemical above the Screening Threshold Quantities found in the DHS CFATS – Chemicals of Interest (http://www.dhs.gov/xlibrary/assets/chemsec_appendixa-chemicalofinterestlist.pdf) the University must complete and submit a Chemical Security Assessment Tool (CSAT) Top-Screen available on the DHS website: http://www.dhs.gov/files/programs/gc_1235582326154.shtm.

2.11 PROCESS SAFETY

Unexpected releases of toxic, reactive, or flammable liquids and gases in processes involving highly hazardous chemicals have been reported for many years in various industries that use chemicals with such properties. Regardless of the industry that uses

these highly hazardous chemicals, there is a potential for an accidental release any time they are not properly controlled, creating the possibility of disaster.

The major objective of process safety management of highly hazardous chemicals is to prevent unwanted releases of hazardous chemicals especially into locations which could expose employees and others to serious hazards. An effective process safety management program requires a systematic approach to evaluating the whole process. Using this approach the process design, process technology, operational and maintenance activities and procedures, non-routine activities and procedures, emergency preparedness plans and procedures, training programs, and other elements which impact the process are all considered in the evaluation. The various lines of defense that have been incorporated into the design and operation of the process to prevent or mitigate the release of hazardous chemicals need to be evaluated and strengthened to assure their effectiveness at each level. Process safety management is the proactive identification, evaluation and mitigation or prevention of chemical releases that could occur as a result of failures in process, procedures or equipment.

Laboratory staff members, the EH&S Office, and a representative from Facilities and Engineering should be part of the team conducting the process safety analysis.

Complete and accurate written information concerning process chemicals, process technology, and process equipment is essential to an effective process safety management program and to a process hazards analysis. The compiled information will be a necessary resource to a variety of users including the team that will perform the process hazards analysis; those developing the training programs and the operating procedures; contractors whose employees will be working with the process; those conducting the pre-startup reviews; local emergency preparedness planners; and insurance and enforcement officials.

The information to be compiled about the chemicals, including process intermediates, needs to be comprehensive enough for an accurate assessment of the fire and explosion characteristics, reactivity hazards, the safety and health hazards to workers, and the corrosion and erosion effects on the process equipment and monitoring tools. Current SDS information can be used to help meet this requirement which must be supplemented

with process chemistry information including runaway reaction and over pressure hazards if applicable.

Process technology information will be a part of the process safety information package and it is expected that it will include flow chart diagrams as well as employer established criteria for maximum inventory levels for process chemicals; limits beyond which would be considered upset conditions; and a qualitative estimate of the consequences or results of deviation that could occur if operating beyond the established process limits. Employers are encouraged to use diagrams which will help users understand the process.

A block flow diagram is used to show the major process equipment and interconnecting process flow lines and show flow rates, stream composition, temperatures, and pressures when necessary for clarity. The block flow diagram is a simplified diagram.

Process flow diagrams are more complex and will show all main flow streams including valves to enhance the understanding of the process, as well as pressures and temperatures on all feed and product lines within all major vessels, in and out of headers and heat exchangers, and points of pressure and temperature control. Also, materials of construction information, pump capacities and pressure heads, compressor horsepower and vessel design pressures and temperatures are shown when necessary for clarity. In addition, major components of control loops are usually shown along with key utilities on process flow diagrams.

Piping and instrument diagrams (P&IDs) may be the more appropriate type of diagrams to show some of the above details and to display the information for the piping designer and engineering staff. The P&IDs are to be used to describe the relationships between equipment and instrumentation as well as other relevant information that will enhance clarity.

A process hazard analysis (PHA), sometimes called a process hazard evaluation, is one of the most important elements of the process safety management program. A PHA is an organized and systematic effort to identify and analyze the significance of potential hazards associated with the processing or handling of highly hazardous chemicals. A PHA provides information which will assist employers and employees in making decisions for improving safety and reducing the consequences of unwanted or unplanned releases of

hazardous chemicals. A PHA is directed toward analyzing potential causes and consequences of fires, explosions, releases of toxic or flammable chemicals and major spills of hazardous chemicals. The PHA focuses on equipment, instrumentation, utilities, human actions (routine and nonroutine), and external factors that might impact the process. These considerations assist in determining the hazards and potential failure points or failure modes in a process.

The selection of a PHA methodology or technique will be influenced by many factors including the amount of existing knowledge about the process. Is it a process that has been operated for a long period of time with little or no innovation and extensive experience has been generated with its use? Or, is it a new process or one which has been changed frequently by the inclusion of innovative features? Also, the size and complexity of the process will influence the decision as to the appropriate PHA methodology to use. All PHA methodologies are subject to certain limitations. For example, the checklist methodology works well when the process is very stable and no changes are made, but it is not as effective when the process has undergone extensive change. The checklist may miss the most recent changes and consequently the changes would not be evaluated. Another limitation to be considered concerns the assumptions made by the team or analyst. The PHA is dependent on good judgment and the assumptions made during the study need to be documented and understood by the team and reviewer and kept for a future PHA.

2.12 WORKING WITH ANIMALS

The Institutional Animal Care and Use Committee (IACUC) has issued Guidelines and information for researchers and caregivers that addresses regulatory compliance, animal use, animal care, hazards and related issues (including the NIH Assurance) in relation to laboratory work with animals. These guidelines can be obtained from IACUC and the procedures should be followed for any research work involving animals. Information about the University IACUC can be found on Office of Regulatory Research Compliance (ORRC) website at www.howard.edu/orrc