DEPARTMENTAL SAFETY REPORT
DEPARTMENT OF CHEMICAL ENGINEERING
MCMASTER UNIVERSITY

Revised 31 October 2001

Everyone in chemical engineering is required to fill out a departmental safety report before they may start their research. In our department we have two types of reports: computational work and experimental work.
Each experimental safety report will be reviewed by the Departmental Safety Committee and may be returned for revision before acceptance.

Computational Reports
If you are doing computational work only, then you must fill out the computational work report, sign the report and have it approved by your supervisor(s). The report has to be reviewed and approved on a yearly basis.

Experimental Report
If you are performing experimental work, a concise safety report is to be prepared and submitted to your research supervisor(s) for approval. **No one can commence their experimental work until their report is submitted and approved by the supervisor and the departmental safety committee and the WHMIS and other required training are taken.** The standard "Departmental Safety Report" cover sheet must be attached to the front of the safety report, completely filled out and signed by the researcher and the supervisor(s).
The supervisor should review the safety report with the researcher and ensure that the researcher understands the safety hazards, the key elements of the MSDS sheets and other safety documents. To facilitate this, the researcher should highlight the MSDS and the other safety documents to indicate the most significant hazards. Copies of highlighted MSDSs together with the report must be given to the supervisor for his/her records. Copies of MSDS sheets must be kept by the researcher and be readily available.
After the above review and approval by the supervisor(s) the completed safety report without MSDSs must be submitted to the Departmental Safety Committee (submit to Justyna Derkach, JHE-138). Whenever there is a significant change in the research project an addendum should be submitted using the same format.

Frequency
A safety report must be submitted prior to the start of a research project. Whenever there is a significant change in the nature of a research project (that is, when the potential hazards change) the researcher must submit an addendum. If there is no significant change in experimental work it is still necessary to submit, on a yearly basis, a statement signed by the researcher and the supervisor that there was no significant change in the experimental work. The "Departmental Safety Report" cover sheet can be used for addenda and reaffirmation that there is no change.

MSDS Sheets
If you work with hazardous chemicals, you must obtain the MSDSs, read and understand them before experimenting. Do not attach the safety data sheets to the report submitted to Justyna. Justyna may ask you to provide her with a copy of MSDSs for her records.

Designated Substances
When a designated substance is being used in research, a designated substance assessment must be attached to the report. The assessment must be reviewed and approved by the Joint Health and Safety Committee (JH&SC) for the faculty of engineering before such substance may be used.

Radioactive Substances
Any use of radioactivity must be approved by Health Physics and the specific required training must be taken.

APPLICABILITY
A safety report is to be prepared and submitted to the Departmental Safety Committee (Justyna Derkach, JHE-138) by each supervised researcher in the Department. The term "supervised researcher" includes but is not restricted to: graduate students; undergraduate students; visiting scholars; post doctoral fellows; visiting scientists; research associates; research engineers; research assistants; technicians.

AREAS TO BE ADDRESSED

1. **Research Objective**: In a few sentences describe your research project.

2. **Potential Hazard Under Routine Operation**: These are the day-to-day potential hazards not associated with an emergency.

3. **Laboratory Protective Devices in Use**: for example: fume hood; fire extinguisher (stating type and capacity rating); flammable gas detector; toxic gas monitor.

4. **Personal Protective Devices in Use**: for example: safety glasses; safety goggles (indirectly ventilated or non-ventilated); face mask (including overall-size and skull cap type); air pack; half-face mask respirator; full-face mask respirator; gloves (specifying material type); lab coat; safety shoes; safety helmet; radiation monitoring badges.

5. **Other Protective Procedures In Use:** for example: medical monitoring (specifying type and frequency).

6. **Possible Emergencies**: What types of accidents are possible and what are their consequences. What are the types and quantities (if applicable) of potential hazards. In other words, list a credible "worst-case" scenario.

7. **Procedures for Emergencies**: For example: clean-up methods; neutralization procedures, evacuation plan.

TYPES OF POTENTIAL HAZARDS TO BE ADDRESSED

The main likely type of potential hazards encountered in the laboratory include but are not limited to:

- **Fire/Explosion:** List the flash point and the autoignition temperature. List the fire hazard rating code. List the lower explosive limit (LEL) and the upper explosive limit (UEL)

- **Toxic:** The category usually comprised chemicals: For chemical hazards a Manufacturer's Safety data Sheet (MSDS) must be read but does not have to be attached to the report. List the acceptable exposure values, i.e. threshold limit value (TLV) or time-weighted average (TWA).

- **Radioactive:** List the acceptable exposure values.

- **Electrical**

- **High Pressure**

- **Mechanical**

- **Falling Objects**

NEAR-BY ASSISTANCE

If the experimental work is potentially hazardous (either the equipment and/or experiment is potentially hazardous) you must not work alone. It is necessary to have available a "qualified" person near-by who understands safety procedures. In this section you must address how such assistance will be available during normal working house and outside normal hours. Experimenting after regular working hours must be approved by the supervisor(s).

- **Normal Working Hours:** usually there will be qualified persons in the same lab, or on the same floor; please identify them.

- **Outside Normal Working Hours**: Comment on how you will ensure that a "qualified" person is available.

SPECIAL TRAINING REQUIRED
Please list all of the special training attended including dates (for example: WHMIS, gas cylinder handling, fire safety training, biosafety, radioactive).

Prepared by Safety Committee (October 2001 – Dr. Dickson, J. Derkach, D. Keller, E. Takacs)

Appendix A: Designated Substances

If you plan using a Designated Substance you must prepare an assessment report before the experimental work starts. "Designated Substance" has a legal definition under the Occupational Heath and Safety Act of Ontario. This act has defined eleven substances "...to which the exposure of a worker is prohibited, regulated, restricted, limited or controlled" [quoting from the Act, 1(1)]. The eleven substances are:

acrylonitrile
arsenic
asbestos
benzene
coke oven emissions
ethylene oxide
isocyanates
lead
mercury
silica (crystalline, inhalable [i.e. less than 5 um])
vinyl chloride

The substances that we are most likely to run across in Chemical Engineering are benzene and isocyanates. Occasionally someone may want to use acrylonitrile or inhalable crystalline silica. Mercury is seldom an issue anymore, since the university has phased out mercury thermometers and decent quality alternatives are now available.

There is no lower limit on the reportable amount of a designated substance. Nor is there any differentiation made as to its form (with the exception of silica). For example, lead contained in solder is deemed to be a reportable designated substance.

You can get more information about designated substances at:

http://www.workingatmcmaster.ca/eohss/

Click on “Risk Management Manual” from the side navigation
Scroll down to
5. Hazardous Materials
click on 500 Designated Substances Control Program

The designated substance assessment form is at:

http://www.workingatmcmaster.ca/eohss

scroll down to FEATURED on the right
click on Designation Worksheets RMM 500 app a