Chemical and Biological Engineering
Undergraduate Laboratory Emergency Response Plan

Laboratory Room Number: 1D25
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Area Supervisor: Dale Claude 966-4707
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Contents:

MISSION STATEMENT

To become familiar with safety hazards and emergency response procedures in the Chemical Engineering Undergraduate Laboratory.

Please do not hesitate to report a problem with the equipment.

IF THERE IS AN EMERGENCY,

REPORT IT AND GET TO SAFETY

Shutdown of equipment will be done by Technician and/or Lab Co-ordinator

GENERAL INFORMATION

Known Hazards

List Physical Hazards:

Heavy Teaching apparatus equipment, Low pressure steam (15 psi), Medium Pressure Steam (30 psi), Fall hazard, Compressed air, Glass equipment, High voltage equipment, High Amperage electric generator, Compressed air, Steam Reboilers, Mechanical rotating arm, Small particulates, Hot Water (+60 °C), Unsecured equipment on tables, High pressure vessel, Implosion hazard, Heated exposed surfaces (+60 °C), hydrocarbon odor, ammonia odor, Chemical sensitizers,

List Chemical Hazards:

Flammable Compressed Gas, Inert Compressed Gases, Low pressure Caustic gas, Compressed Air, Flammable Liquids, Caustic solids, Caustic liquids, Acidic liquids.

List Biological Hazards:

Yeast

Safety Data Sheets Location

http://ccinfoweb.ccohs.ca/msds/search.html

Emergency Response Equipment Location

Equipment:	Location:
First Aid Kit	Center Chase in 1D25
Fire Extinguisher	By West Emergency Exit, Door leading to 1D04, Besides Door 1D25.3
Spill Kit	By chase closest to middle of lab
Emergency Gas Shutoff	Outside in hallway, left of south door in 1D25
Eyewash and Shower	In hallway past North Entrance in 1D25, Water hose in 1D25.1

Required Training

All Students are expected to take the safety course and read this Emergency Response Plan.

Required Personal Protective Equipment (PPE)

Standard laboratory attire: Long pants and closed-toe shoes, Hair back, No jewelry, Knee length Lab coats

Eye protection: Safety Glasses, Eye Shields

Personal Protective Equipment Available in 1D25

Gloves: Nitrile and/or latex gloves

Eye protections: Safety Googles, Face Shield

Heargear: Hardhat

Other: Ear Plugs

EMERGENCY RESPONSE PROCEDURE

Fire

Hazardous Conditions:

- Fire

Response Procedure:

1) Evacuate the immediate area and out of the building
2) Leave your belongings
3) Upon leaving the building PULL THE FIRE ALARM
4) On building exit, proceed directly to the lawn south of Rutherford Rink
   i) Check wind direction
   ii) Evacuate perpendicular of wind direction or upwind, whichever is safer
5) Report all known information about the incident to attending Emergency Response Personnel
6) Get off campus grounds

Minor Spill

Hazardous Conditions:

- In the event of a minor spill.

Response Procedure:

1) If there is a need, evacuate the immediate area
2) Let TA, or Lab Coordinator, and/or Lab Technician know about the spill

Major Spill

Hazardous Conditions:

- For spills resulting in fire, potential for fire, creating conditions immediately dangerous to life and health, or spills of materials where the hazard is not known.

Response Procedure:

1) Evacuate the immediate area, and out of the building
2) Leave your belongings
3) Upon leaving the building PULL THE FIRE ALARM
4) On building exit, proceed directly to the lawn south of Rutherford Rink
   i) Check wind direction
   ii) Evacuate perpendicular of wind direction or upwind, whichever is safer
5) Report all known information about the incident to attending Emergency Response Personnel

If you smell Ammonia (Irritant)

Ammonia is an extremely strong irritant and lachrymator. Exposures of 2500 ppm are life threatening. Skin contact with the gas or liquid may result in severe frostbite. Do not touch frosted pipes and valves. Ammonia reacts with diverse compounds to form explosive products. Especially avoid contact with silver, gold and mercury.

Hazardous Conditions:

- An Ammonia gas smell has been detected

Response Procedure:

1) Let TA, or Lab Coordinator, and/or Lab Technician know about the smell, and someone will investigate
2) Evacuate the immediate area if the smell is too strong

Ammonia Gas **Leak (Causes Physical Effects)**

Ammonia is an extremely strong irritant and lachrymator. Exposures of 2500 ppm are life threatening. Skin contact with the gas or liquid may result in severe frostbite. Do not touch frosted pipes and valves. Ammonia reacts with diverse compounds to form explosive products. Especially avoid contact with silver, gold and mercury.

Emergency Conditions:

- If Ammonia odor is detected through the respirator
- If feel light headed and/or can't breathe for no reason,

Emergency Response Procedure:

1) Evacuate the immediate area
2) If you see someone fallen down and Ammonia is leaking, do not attempt to help. Tell a TA, or Lab Coordinator, and/or Lab Technician if safe to do so
3) Upon leaving the building PULL THE FIRE ALARM
4) On building exit, proceed directly to the lawn south of Rutherford Rink.
5) Report all known information about the incident to attending Emergency Response Personnel.

Active Shooter

An Active Shooter is an individual actively engaged in killing or attempting to kill people in a confined and populated area; in most cases, active shooters use firearms(s) and there is no pattern or method to their selection of victims. Active shooter situations are unpredictable and evolve quickly. Typically, the immediate deployment of law enforcement is required to stop the shooting and mitigate harm to victims. Because active shooter situations are often over within 0 to 15 minutes, before law enforcement arrives on the scene, individuals must be prepared both mentally and physically to deal with an active shooter situation.

Emergency Conditions:

- If an Active shooter is inside the Engineering College

Emergency Response Procedure:

RUN

1) If there is an accessible escape path, attempt to evacuate the premises. Leave your belongings.
2) If you leave the building, do NOT pull the fire alarm on the way out
3) On building exit, proceed directly to parking lot Z
4) If you see Protective Services, Saskatoon Police in uniform or in combat fatigues, drop whatever you have and place your hands where the police can see them
5) Report all known information about the incident to attending Emergency Response Personnel
6) Leave campus grounds
7) Do not update social media about police position

HIDE

1) If you cannot escape, find your nearest Safe room.
   i) For the Undergraduate lab, the safe room is 1D15
   ii) If you can't make it there, find a room and lock the door behind you
   iii) Turn off any noise that may attract the shooter
   iv) Do not update social media as to your whereabouts
2) Blockade the door with heavy furniture
3) Turn off lights and get everyone to silence their cell phones
4) Dial 911, if possible, to alert police to the active shooter's location
   i) If you cannot speak, leave the line open and allow the dispatcher to listen
   ii) Remain calm and quiet
   iii) Do not update social media as to your whereabouts

FIGHT

1) As a last resort, and only when your life is in imminent danger, attempt to disrupt and/or incapacitate the active shooter by:
   i) Throwing items and improvising weapons
   ii) Yelling at him/her
   iii) Rush the shooter in a large group

If the Equipment shorts out or emits an Electrical Arc/Spark

1D25 and 1D25.1 contains equipment that runs on voltages from 50 - 208 V or 120 - 400 V. Harm can be caused to any person when they are exposed to 'live parts' that are either touched directly or indirectly by means of some conducting object or material. Voltages over 50 volts AC or 120 volts DC are considered hazardous. Faulty electrical appliances can also lead to fires. As well as causing injuries and loss of life, fires cause damage to plant, equipment and property.

Emergency Conditions:

- Equipment discharges an arc or spark
- Equipment unexpectedly shuts down

Response Procedure:

1) Evacuate the immediate area, get yourself away from the apparatus
2) Do not attempt to fix the problem
3) Let the Teaching Assistant, Lab Coordinator, and/or Lab Technician know about the event

If the Equipment shorts out or emits an Electrical Arc/Spark and someone is hurt

1D25 and 1D25.1 contains equipment that runs on voltages from 50 - 208 V or 120 - 400 V. Harm can be caused to any person when they are exposed to 'live parts' that are either touched directly or indirectly by means of some conducting object or material. Voltages over 50 volts AC or 120 volts DC are considered hazardous. Faulty electrical appliances can also lead to fires. As well as causing injuries and loss of life, fires cause damage to plant, equipment and property.

Emergency Conditions:

- Equipment discharges an arc or spark and someone is electrified

Response Procedure:

1) Evacuate the immediate area, get yourself away from the apparatus
2) Don't touch the injured person if he or she is still in contact with the electrical current.
3) Call 911
4) Do not attempt to turn off the source of electricity
5) Let the Teaching Assistant, Lab Coordinator, and/or Lab Technician know about the emergency
6) Report all known information about the incident to attending Emergency Response Personnel.

Inert Gas

These gases can all cause rapid asphyxiation and death if released in a confined area. These gases, either as a liquid or gas may cause severe frostbite to eyes or skin. Do not touch frosted pipes or valves.

Emergency Conditions:

- You can't breathe for no apparent reason
- You see someone incapacitated on the ground
- If Low Oxygen Alarm goes off (We should get a Gas detector for the lab)

Emergency Response Procedure:

1) If feel light headed and/or can't breathe for no reason, try evacuate the immediate area and leave the building
2) Upon leaving the building PULL THE FIRE ALARM
3) On building exit, proceed directly to the lawn south of Rutherford Rink.
4) Report all known information about the incident to attending Emergency Response Personnel.

Hydrogen Gas

Hydrogen is a flammable gas. A mixture of hydrogen and oxygen or air will explode in a confined area in the presence of a spark. A hydrogen flame is virtually invisible in a well-lighted area. Hydrogen may cause severe frostbite as a liquid or gas. Do not touch frosted pipes or valves.

Emergency Conditions:

- You can't breathe for no apparent reason
- You see someone incapacitated on the ground
- If Lower Explosive Limit (LEL) Alarm goes off (We should get a Gas detector for the lab)

Emergency Response Procedure:

1) If feel light headed and/or can't breathe for no reason, try evacuate the immediate area and leave the building
2) Upon leaving the building PULL THE FIRE ALARM
3) On building exit, proceed directly to the lawn south of Rutherford Rink.
4) Report all known information about the incident to attending Emergency Response Personnel.

Inclement Weather

Emergency Conditions:

- Tornado
- Hail storm
- Severe Thunderstorm

Emergency Response Procedure:

1) Get away from windows or get to a room with no windows
2) Update social media indicating safe areas and warn others to stay away
3) Stay in the area until imminent danger has passed

Steam pipe rupture or High Energy Line Break (HELB).

Steam is water in the gas phase at 120 °C, which is formed when water boils. Steam is invisible; however, "steam" often refers to wet steam, the visible mist or aerosol of water droplets formed as this water vapor condenses.

Emergency:

- Steam line ruptures in 1D25 or 1D25.1

Emergency Conditions:

- Escaping high pressure steam can hurl debris at 200 mph. Anyone in the vicinity of the break is in danger of being struck by flying, high velocity debris.
- Slugs of hot water released from the rupture and hot water may cause burns to firefighters and civilians
- Anyone in the vicinity of the escaping steam will be exposed to high temperatures and may sustain serious burn injuries
- Leaking steam will condense quickly filling the plant, obscuring vision
- Breathing superheated steam can result in respiratory burn injuries
- People may be trapped in areas by the escaping steam.

Emergency Response Procedure:

1) Try evacuate the immediate area and leave the building.
2) If you are trapped by steam rupture, do NOT attempt to go through steam plume, severe burns will be sustained
   i) If life in is imminent danger, shield yourself as much as possible with something solid and go under the steam plume or the point furthest away from rupture
   ii) If life is NOT in imminent danger, stay put and wait for steam shutdown or rescue.
3) Upon leaving the building PULL THE FIRE ALARM
4) On building exit, proceed directly to the lawn south of Rutherford Rink
5) Report all known information about the incident to attending Emergency Response Personnel.

Air hose breaks off

The building Compressed Air line operated at 80 - 90 psi. Compressed air can be fatal if it enters a person's bloodstream. Serious injury may also occur from flying particles produced when blowing compressed air.

Hazardous Conditions:

- Air hose breaks and starts to flail around

Response Procedure:

1) Evacuate the immediate area, get the yourself away from the apparatus
2) Do not attempt to fix the problem
3) Let the Teaching Assistant, Lab Coordinator, and/or Lab Technician know about the event

Emergency Contact Information

NAME	TITLE & DEPARTMENT	WORK (OFFICE) PHONE
Kevin Carter	Technician	306-966-**5329**
Dale Claude	Laboratory Co-ordinator	306-966-**4707**
Dr. Mehdi Nemati	Department Head	306-966-**4769**
Richard Blondin	CBE Safety Committee Representative	306-966-**4711**
	Safety Resources	306-966-**4675**
Facilities Management Division	Customer Service Centre (FMD)	306-966-**4496**
Local Emergency Dispatch	Protective Services	306-966-**4496**
Municipal Emergency Responders	• Ambulance • Fire • Police	911 or 9-911
Andrea Book	Chief Building Warden (CoE)	306-966-**5388**
Veronica Bendig	Building Coordinator (CoE)	306-966-**5104**

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STATEMENT OF ACCEPTANCE

Please complete and return to

Laboratory Coordinator
Department of Chemical Engineering
Room 1D25 Engineering
University of Saskatchewan

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I have read the **Chemical and Biological Engineering Undergraduate Laboratory Emergency Response Plan** setting forth the Rules and Safe Practices to be followed in the Chemical Engineering Undergraduate Laboratory at the University of Saskatchewan. After studying its contents, I understand that while I am a student or an employee in the department I am responsible for obeying the Safety Rules and for exercising good judgment in the application of safe practices in a continuous effort to prevent accident that might result in injury to either myself or my coworkers.

(Date) _____

(Name) _____
(Please Print)

(Signature) _____

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