

CM4120 Safety Orientation



“Spring?” Semester 2015

CM4120

Chemical Plant Operations Lab

Safety Program

PAWS Program will provide structure for CM4120 lab safety

- entire class is responsible for safe environment
- everyone will have a turn with a specific safety responsibility
- two safety meetings with entire class
 - 2/20/15
 - 4/17/15
- may have brief, informal safety meetings at end of each run week if needed

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What is the same:

2014-15 Safety Manual for CM4110 and CM4120

2 from each team will coordinate safety for the assigned project

Safety meetings will cover:

- New PAWS reports, follow-up on open PAWS

- Review of SIC

- Report on special safety topics

- Safety meetings include "Safety Outside the Workplace" topics

Safety meetings on Friday at 9:00 sessions

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What is different from CM4110:

Teams can be selected based on “topic-of-interest”

Team size may vary from 3 to 4, based on project scope

Lab will be inspected by 9:00 AM every week starting 1/27/15

Lab activities are in UO Lab area, B003, B003A

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About Control Room (107 Chem Sci)
activities:

Stay engaged in Process Operations:

Do not distract others or “hang out”
Not a time to get Plant Design done
No music, movies, video games,
hangman, etc. in control room

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Control rooms can get boring!



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Proper apparel reminder!

UO Lab areas

- long pants, shirts that cover shoulders and mid-section, no open-toe shoes or sandals
- hardhat in designated areas
- safety glasses w/ side shields
- when *working* in lab:
 - non-porous, over-the-ankle safety shoes
 - *use goggles, gloves, face shield, apron for hazardous chemicals – all areas*

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NFPA Hazardous Areas in UO Lab

As defined in NEC article 500:

Determine *Hazard Class*

Class I: "flammable gases or vapors are or may be present in sufficient qty. to produce ignitable mixtures"

Class II: combustible dusts

Class III: ignitable fibers and flyings

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Next determine *Division* of hazard class:

Div. 1, vapors can exist during normal operations, during regular routine maintenance, or due to leakage

Div. 2, vapors are normally confined in containers or piping; or ignitable mixtures are prevented thru ventilation

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Finally, determine the hazard *Group* of potentially ignitable vapor:

group A, atmospheres containing Acetylene;

group B, H_2 , fuel and combustible process gas w/ more than 30% H_2 , others w/ equivalent hazard;

group C, atmospheres containing ethyl ether and equivalent hazards;

group D, atmospheres containing butane, *ethanol*, gasoline and others with equivalent hazard.

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Electrical Classification of UO Lab areas :

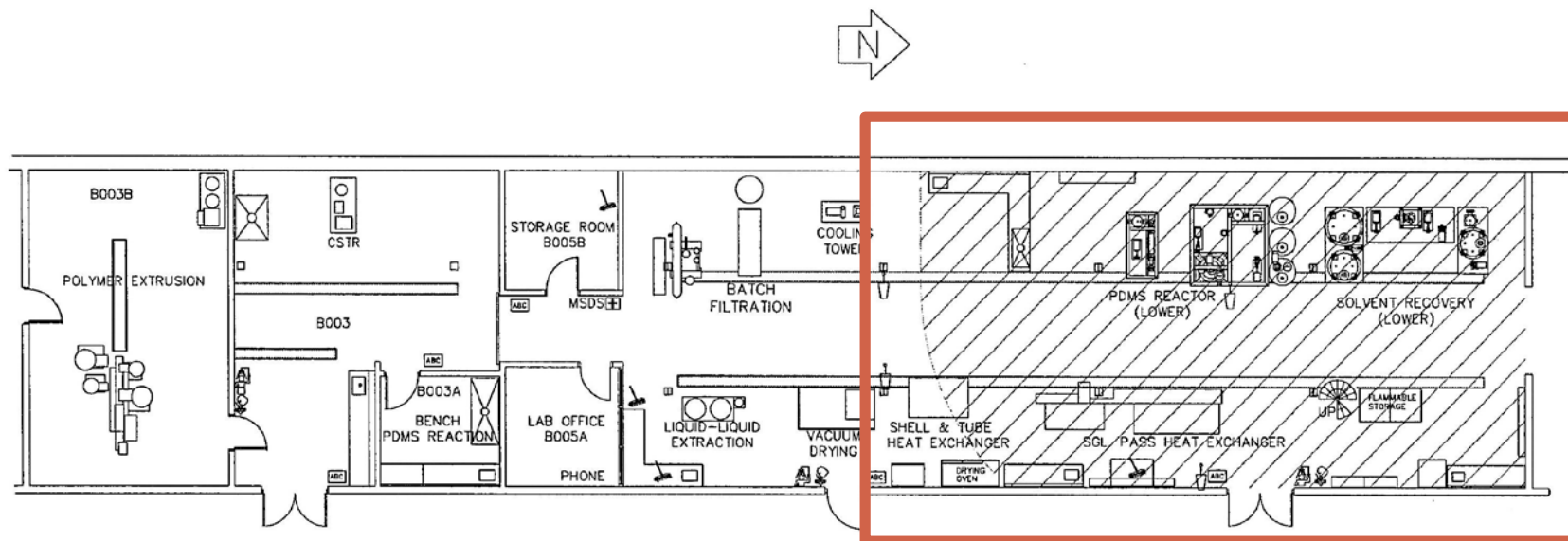
- Standard area – majority of UO Lab
- Class I, Div. 2, group D – areas around sample valves, pump and valve seals, and basement floor area around pilot plants
- Class I, Div. 1, group D – drain trenches

See Floor Plans, pgs. 24-26 Safety Manual

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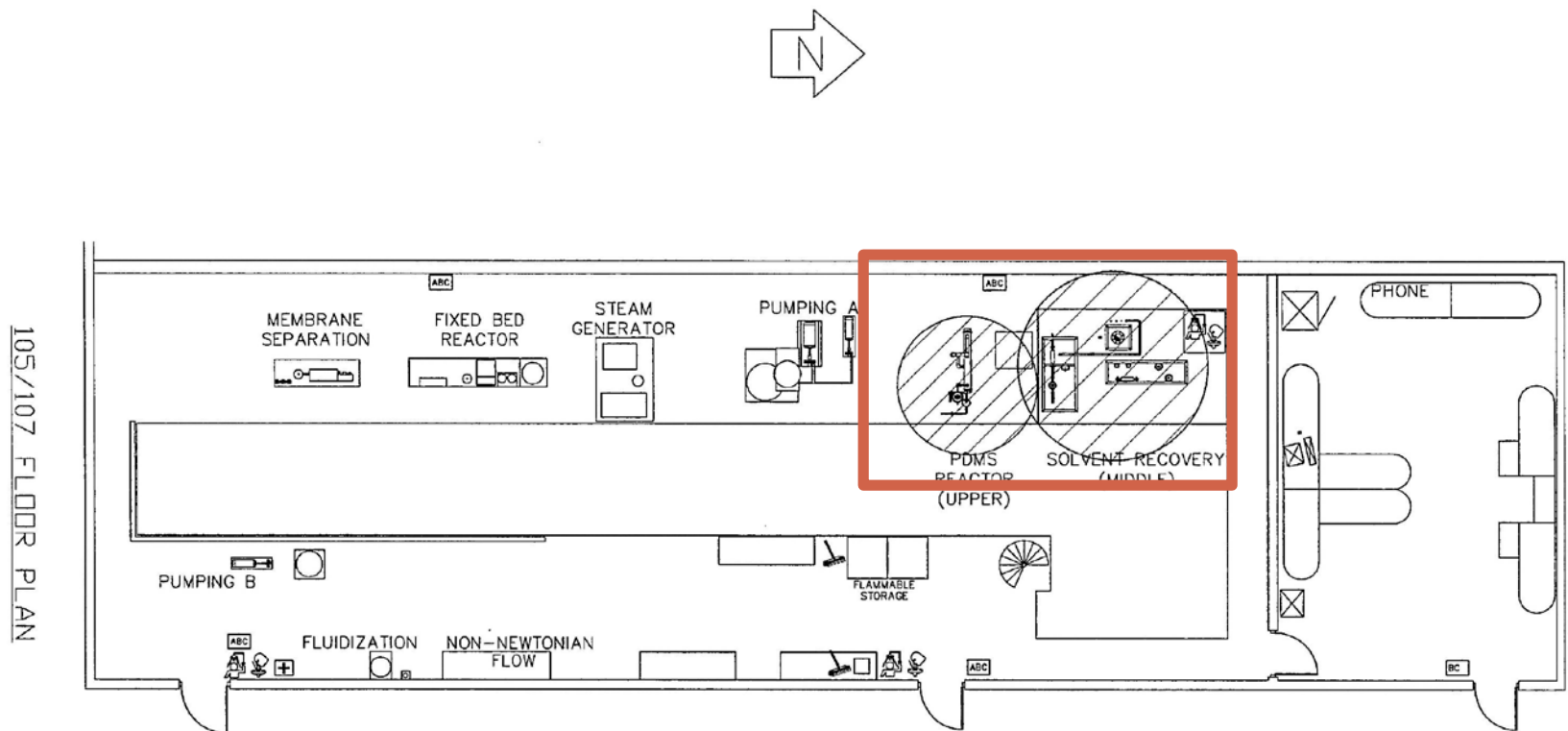


B003/B005 FLOOR PLAN

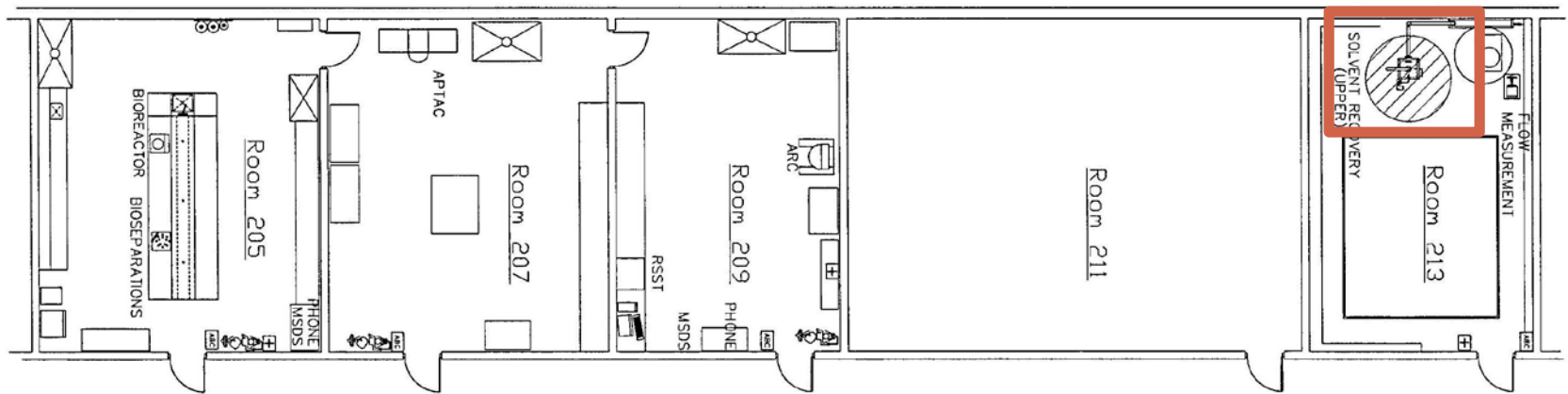
LEGEND

	DRAIN TRENCH		EYE WASH		DRAIN PLUG
	NFPA CLASS 1, DIV. 2 AREA		SAFETY SHOWER		SPILL EQUIPMENT
			FIRST AID KIT		FIRE EXTINGUISHER

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Any Non-standard areas:

no calculators!

no laptops!

no cell phones, ipods, etc.!

Any/all electrical/electronic devices
must be labeled as suitable for Cl. I,
Div. 2 areas

Specific Hazards: Solvent Recovery Unit

- ◉ Ethanol/water/steam
- ◉ Process stream sampling
- ◉ Flammable/hot material handling
- ◉ N₂ safety
- ◉ Remote operations – valves moving, motors start/stop from control room, but w/ personnel on plant floor

Specific Hazards: PDMS Reactor Unit

- ◉ Silicone fluids/steam/KOH/toluene
- ◉ Process stream sampling
- ◉ Hot/silicone/caustic material handling
- ◉ N₂ safety
- ◉ Remote operations – valves moving, motors start/stop from control room, but w/ personnel on plant floor



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Special Safety Project for Cycle 2:

1 team of students with a specific interest in the safety program

Thorough review of the PAWS program:

- Tabulate, analyze, and report on all PAWS reports and safety incidents for ABET

- Conduct a lab safety practical

- Update PAWS tracking website

- Evaluate performance on recommendations from 2013-14 PAWS program

- Recommendations for next year

Specific Hazards: Bioreactor Unit

- ◉ HCl/NaOH/O₂/N₂/steam (autoclaving)
- ◉ Level 1 Biohazard (p. 10 & 11 Safety Manual)
- ◉ Unattended equipment operations (see CM Dept. Safety Manual)