Stony Brook University

Environmental Health & Safety
Policy and Procedure

Subject: Confined Space Operations	**Date**: 5/17/21
EH&S Program: Occupational Safety	**Next Review**: 5/17/24
Scope: University / Hospital Wide	**Original**: 1997

Printed copies are for reference only. Please refer to the electronic copy for the latest version.

Policy:

Entry into confined spaces can pose atmospheric and physical hazards which can be life threatening. To ensure the safety of all persons entering confined spaces the requirements of this policy shall be implemented by individuals planning work in confined spaces, including the entry supervisor, authorized entrant and attendant.

Definitions:

Acceptable entry conditions: conditions that must exist in a confined space to allow entry and to ensure that employees involved with a confined space entry can safely enter into and work within the space.

Atmosphere: refers to oxygen content, gases, vapors, mists, fumes, and dusts within a confined space.

Atmospheric testing: pre-entry testing by a *competent person* with a calibrated direct-reading instrument to measure (in sequence) oxygen content, flammable gases and vapors, and toxic air contaminants.

Atmospheric monitoring: continuous monitoring with a calibrated direct-reading instrument to verify acceptable atmospheric conditions for entrants.

Attendant: a trained individual stationed outside one or more permit required confined spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit required confined space program.

Authorized entrant: a trained employee who is authorized by the employer to enter a permit required confined space.

Competent person: a person who by training and experience is familiar with all requirements and can evaluate confined space hazards, perform atmospheric tests and/or evaluate the results.

Confined space: a space that:
(1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and
(2) Has limited or restricted means for entry or exit (for example, tanks, vessels,

silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and
(3) Is not designed for continuous occupancy.

Emergency: any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit required confined space that could endanger entrants.

Entry: the action by which a person passes through an opening into a permit required confined space.

Entry permit: the permit document that is provided by Environmental Health and Safety (EH&S) that allow and control entry into a permit required confined space.

Entry supervisor: the trained person responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section.

Hazardous atmosphere: an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness.

Immediately dangerous to life or health (IDLH): any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

Non-permit confined space: a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

Permit required confined space: means a confined space that has one or more of the following characteristics:
(1) Contains or has a potential to contain a hazardous atmosphere;
(2) Contains a material that has the potential for engulfing an entrant;
(3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
(4) Contains any other recognized serious safety or health hazard.

Prohibited condition: any condition in a permit required confined space that is not allowed by the permit during the period when entry is authorized. "

Special Requirements includes, but are not limited to:

1) Lock Out/Tag Out, including blank, cap, purge, flush or vent lines
2) Lifelines, harness, emergency tripod, wristlets, anklets, etc.
3) Lighting and ventilation
4) Respirators, breathing apparatus, PPE, etc.
5) Posting and securing access to the confined space as necessary
6) Fire extinguishers
7) Hot Work Permit

Procedures:

A. Identification of Confined Spaces

1. Facilities is responsible for identifying all Permit and Non-Permit Required Confined space locations in their area to employees, contractors and outside agencies working at or on Stony Brook University property.
2. Facilities is responsible for posting and maintaining signs at all confined space entry locations that require signs.

B. Supervisor Responsibilities

1. Ensure that all entrants and attendants have been properly trained. If not, entry is NOT permitted. **Required Training includes:**
   a. Confined Space Awareness
   b. Confined Space Supervisor Training
   c. Confined Space Attendant Training
   d. Confined Space Entry Training

2. Review the confined space entry requirements with the qualified authorized entrants and attendants.
3. Obtain a Confined Space Assessment/Permit Form **(Appendix A)** and provide all required information, including estimated entry time(s).
4. Contact the Department of Environmental Health and Safety for authorization and to establish entry requirements.
5. Arrange for all "Special Requirements" and ensure that all "Special Requirement" are completed, provided and in place.
6. Ensure air monitoring and entry/exit tracking is being conducted by obtaining and maintaining the Confined Space Atmospheric Monitoring/Entry Log **(Appendix B).**
   a. If IDLH environment is present – **DO NOT ENTER SPACE**. Contact University Police immediately (632-3333 cell phone) (911 – campus phone).
7. Ensure before a permit required confined space is entered, the atmosphere in the area is tested for oxygen levels, combustible gases, toxic gases and vapors, contaminants that could be found in that confined space, and physical hazards such as noise, temperature extremes, engulfment and other serious safety or health hazards.

8. Contact the Department of Environmental Health and Safety Fire Marshals to conduct initial testing unless other arrangements have been approved by EH&S, utilizing other "qualified" persons. **(See Section H)**
9. Ensure atmospheric conditions are acceptable in conjunction with EH&S.
10. The Supervisor ensures all monitoring equipment used to measure for hazardous atmospheres in a confined space is calibrated and inspected prior to use.
11. The Supervisor ensures that all confined space rescue devices (tri-pod / harness) are operating and functional before an individual makes entry into a confined space.
12. For scheduled work, 24 hours in advance notification must be made by calling the Environmental Health and Safety department 632-6410.

C. Entry Requirements

1. Confined space qualified entrants ensure that all "Special Requirements" have been implemented and that environmental testing results are acceptable. In addition, the entrant must:
    a. Know the hazards associated with the space and their effects.
    b. Properly use the required personal protective equipment and other equipment required for entry.
    c. Maintain a continuous means of communication with the attendant.
    d. Alert the attendant in the event of an emergency.
    e. Evacuate the space if an emergency occurs.

2. Confined space qualified attendant is in position at all times while workers are in the confined space. The attendant:
    a. Knows the hazards associated with the confined space and their effects.
    b. Maintains an accurate count of all persons in the confined space (see Appendix B).
    c. Remains at their assigned station until relieved by another qualified attendant or until all entrants leave the confined space.
    d. Knows how, and has the means, to summon emergency assistance. Contact UPD immediately (632-3333 cell phone) or (333 – campus phone).
    e. Has the authority to order the workers out of a confined space if:
        1) Hazardous conditions exceed those set by the permit.
        2) An unexpected hazard presents itself.
        3) Workers in the confined space show signs of toxic reaction.
        4) A situation occurs outside the confined space which could pose a hazard to the workers located inside the confined space.
        5) The attendant must leave the area.
    f. Performs non-entry rescue procedures only. **UNDER NO CIRCUMSTANCES IS THE ATTENDANT TO ENTER THE CONFINED SPACE.**

3. The supervisor monitors the confined space operations as often as necessary to ensure consistency with the entry permit and maintains acceptable entry conditions.
4. In addition, the supervisor:
    a. Terminates entry and cancels permits when entry operations are completed or if a new condition exists.
    b. Takes immediate and appropriate measures to remove unauthorized entrants.
    c. Conducts required continuous air monitoring, if the work being conducted can adversely affect the atmosphere.

D. Post-Entry Procedures

1. The entrants remove all equipment and materials from the space and returns the space to its planned operating condition.
2. The attendant accounts for all entrants and returns all paperwork and logs to the supervisor.
3. The supervisor shall ensure that all appropriate steps have been taken, notify the Department of Environmental Health and Safety of the completion of the operation.

E. Rescue and Emergency Procedures

1. If an emergency arises, notify UPD at (333-campus phone) or (632-3333 - cell phone) immediately, explain the nature and location of the emergency.
2. EH&S Fire Marshal's Office provides primary emergency rescue services.

F. Training

1. All persons involved in confined space operations including supervisors, authorized entrants and authorized attendants must be trained in confined space operations.
2. Initial and refresher training provides employees with the necessary understanding, skills, and knowledge to perform the job safely.
3. Refresher training is conducted if:
    a. An employee's duties change.
    b. Hazards in the confined space change.
    c. An evaluation of the confined space entry program identifies inadequacies in the employee's knowledge.
4. Training is provided by contacting the EH&S at 2-6410 or visiting our training calendar at the EH&S website. https://ehs.stonybrook.edu

G. Contractors in Permit Required Confined Space Entry

1. The hiring department's confined space qualified supervisor informs the contractor that the workplace contains permit required spaces and entry is allowed only through compliance with the Confined Space Operations Policy. Contractor provides the EH&S department with proof of Confined Space Entry training for each entrant, attendant and supervisor in order to obtain a Confined Space Entry Permit.
2. The hiring department informs the contractor of the hazards of the space and precautions or procedures that must be followed.
    a. Coordinates entry in accordance with this procedure.
    b. Debriefs the contractor at the conclusion of entry operations.
    c. Ensures confined space air monitoring and entry/exit of personnel is being maintained **(see Appendix B).**

H. Special Circumstances

1. With prior approval and training from EH&S, departments may be allowed to conduct the air monitoring normally conducted by the Fire Marshals.
2. In the event a department is given the authority by EH&S to conduct Confined Space Entry without Fire Marshal oversight the following steps must be followed:
    a. All employees must be properly trained by EH&S.
    b. Supervisors must be on site while confined space entry takes place.
    c. The EH&S Manager and Fire Safety Manager will conduct a joint Function Specific Training with the approved department.
    d. Must have the appropriate air monitoring equipment; approved by the Fire Marshals.
    e. EH&S will conduct routine inspections to ensure compliance.

Forms:

- **Appendix A:** Confined Space Permit Assessment Form
- **Appendix B:** Confined Space Atmospheric Monitoring/Entry Log
- **Appendix C:** Confined Space Flowchart
- **Appendix D:** Known Confined Space Location on Campus

Policy Cross Reference:

- **Control of Hazardous Energy / Lockout Tagout**
- **Hot Work**
- **Personal Protective Equipment**

Relevant Standards/Codes/Rules/Regulations/Statutes:
OSHA CFR 1910.146
OSHA CFR 1926. 1203

References and Resources:
NA

Appendix A

EMERGENCIES: University Police – **911**
From a cell phone **(631) 632-3333**
Contact EH&S **(2-6410)** to report a safety problem.

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CONFINED SPACE ASSESSMENT / PERMIT FORM

EACH SECTION MUST BE COMPLETELY FILLED OUT BY A TRAINED AND AUTHORIZED EMPLOYEE BEFORE WORK CAN BEGIN

I. CONFINED SPACE LOCATION / DESCRIPTION (Department/Contractor or requesting Supervisor complete this section)

Location of Space: _____ Space Number_____

Type / Description of Space: _____

Description of work being performed (Purpose of Entry)_____

_____

SBU Department responsible for work: _____

Contractor Name & Address if applicable:_____

Print Name of SBU Supervisor/Manager:_____ID#_____

Print Name of Entrant(s): _____

Print Name of Attendant(s):_____

Scheduled Start: (Date) _____(Time)_____Scheduled Finish: (Date) _____(Time)_____

II. ATMOSPHERIC TESTING – (Fire Marshal will conduct an initial atmospheric test and record results)

PERMISSIBLE ENTRY LEVEL	YES	NO	RESULT	TIME	DATE	INITIAL HERE
% Oxygen (19.5% to 23.5%)	❑	❑				
% of LEL (flammable atmosphere <10%	❑	❑				
H2S (<10ppm)	❑	❑				
Carbon Monoxide (<35ppm)	❑	❑				
Other:	❑	❑				

III. HAZARD ASSESSMENT – (Fire Marshal AND Supervisor/Manager will conduct the Hazard Assessment)

Atmospheric Hazards
Such As:
- ❑ Oxygen Deficiency
- ❑ Oxygen Enrichment
- ❑ Flammable substances
- ❑ Toxic gases, vapors, liquids
- ❑ Inert Gas
- ❑ Other_____

Engulfment Hazard
Such As:
- ❑ Liquid
- ❑ Solids
- ❑ Other_____

Entrapment Hazard
Such As:
- ❑ Inwardly converging walls.
- ❑ Other _____

Other Serious Hazards
Such As:
- ❑ Live Electrical
- ❑ Energized HTHW
- ❑ High Pressure
- ❑ If Permit Space & > 5feet deep
- ❑ Hot Work?
- ❑ Other_____

❑ **PERMIT CONFINED SPACE**
If any hazard box from Section III is checked, the space is considered a Permit Required Confined Space.

❑ **NON - PERMIT CONFINED SPACE**
If no Hazard box from Section III is checked, the space is considered a Non-Permit Required Confined Space. Safety Precautions may still need to be taken.

IV. REQUIRED SAFETY PRECAUTIONS

- ❑ SCBA
- ❑ Air-Line Respirator
- ❑ Fire Retardant Clothing.
- ❑ Harness w/ Lifelines
- ❑ Fire Extinguishers
- ❑ Continuous Air Monitoring
- ❑ Secure Area
- ❑ Personal Protective Equipment
- ❑ Protective Gloves
- ❑ Lighting
- ❑ Respirators
- ❑ Lockout/Tagout
- ❑ Other_____
- ❑ Hot Work Permit

Confined Space Assessment Performed by:_____
Print Name **ID#**

All confined space work shall be performed by personnel who are trained in confined space entry operations and are familiar with the University's Confined Space Policy. Initial and continuous / periodic air monitoring is to be established and recorded BEFORE entry and every 2 hours thereafter for each shift. Attendants shall record entry/exit of all entrants. If required, this permit expires at the completion of work and/or if conditions change that adversely affects safety in the work area, and is valid for 8 hours only.

Entrant Signature:_____**Date:**_____
Attendant Signature:_____**Date:**_____
Contractor Signature:_____**Date:**_____

Appendix B

EMERGENCIES: University Police – **911**
From a cell phone **(631) 632-3333**.
Contact EH&S **(2-6410)** to report a safety problem.

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CONFINED SPACE ATMOSPHERIC MONITORING/ENTRY LOG

ATMOSPHERIC MONITORING

Instrument name:					Calibration date:		
GAS	LIMIT	INITIAL RESULT	2ND HOUR RESULT	4TH HOUR RESULT	6TH HOUR RESULT	8TH HOUR RESULT
% Oxygen	19.5% to 23.5%					
% LEL (flammable atmosphere)	<10%					
H_2S	<10 ppm					
Carbon Monoxide	<35 ppm					
Other:						
Time tested						
Date tested						

Person performing testing:	Dept:	Date:

Monitor continuously, recording results every 2 hours • Retest after breaks and lunch
Maintain separate air monitoring/entry log for each additional day

CONFINED SPACE ENTRY LOG

DATE	ENTRANT'S NAME	ENTRY TIME	EXIT TIME	ATTENDANT'S INITIALS
		______ ☐ AM ☐ PM	______ ☐ AM ☐ PM	
		______ ☐ AM ☐ PM	______ ☐ AM ☐ PM	
		______ ☐ AM ☐ PM	______ ☐ AM ☐ PM	
		______ ☐ AM ☐ PM	______ ☐ AM ☐ PM	
		______ ☐ AM ☐ PM	______ ☐ AM ☐ PM	
		______ ☐ AM ☐ PM	______ ☐ AM ☐ PM	
		______ ☐ AM ☐ PM	______ ☐ AM ☐ PM	
		______ ☐ AM ☐ PM	______ ☐ AM ☐ PM	
		______ ☐ AM ☐ PM	______ ☐ AM ☐ PM	
		______ ☐ AM ☐ PM	______ ☐ AM ☐ PM	

Appendix C.
Confined Space Responsibility Flowchart

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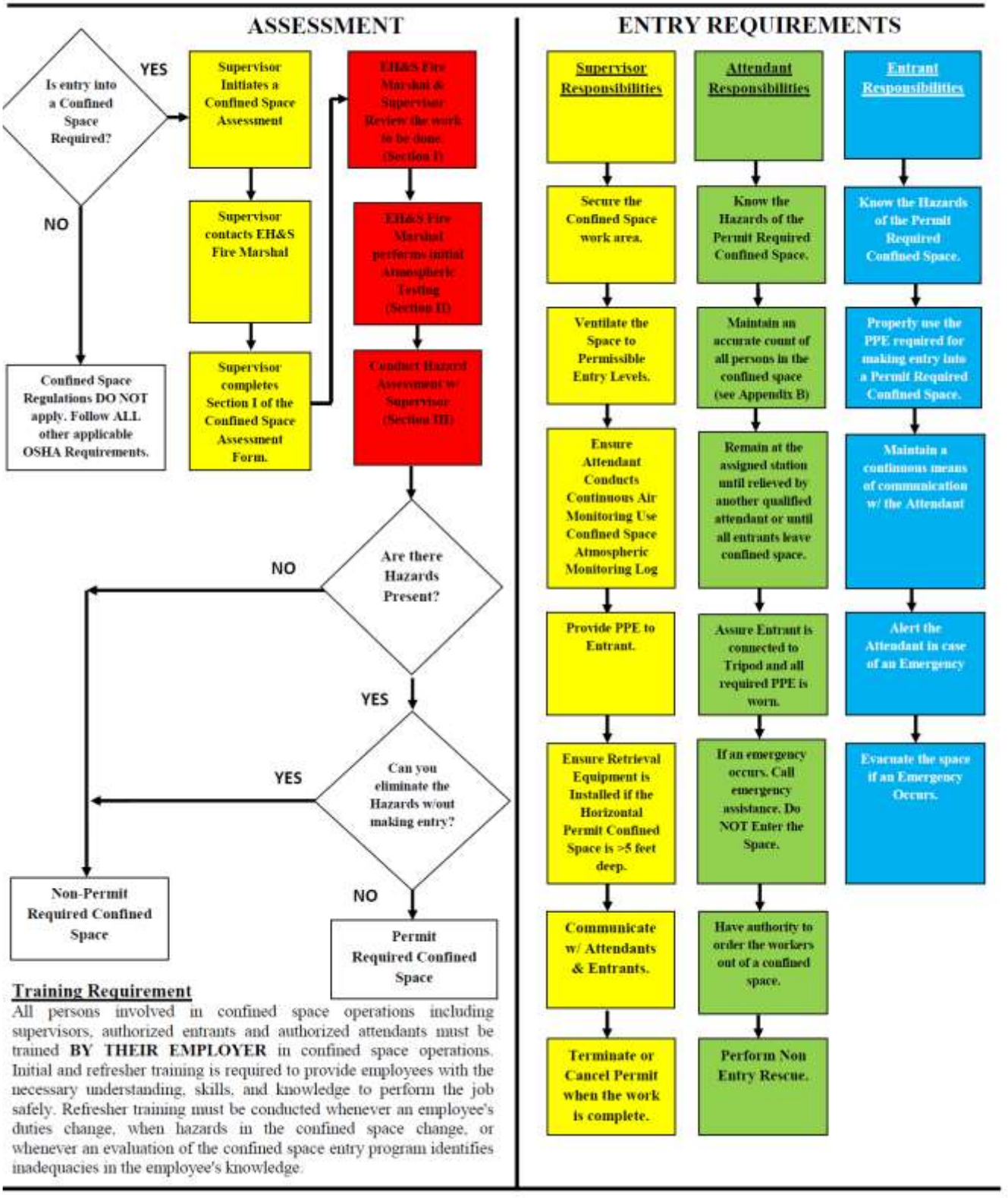

Training Requirement

All persons involved in confined space operations including supervisors, authorized entrants and authorized attendants must be trained **BY THEIR EMPLOYER** in confined space operations. Initial and refresher training is required to provide employees with the necessary understanding, skills, and knowledge to perform the job safely. Refresher training must be conducted whenever an employee's duties change, when hazards in the confined space change, or whenever an evaluation of the confined space entry program identifies inadequacies in the employee's knowledge.

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APPENDIX D

DEPARTMENT OF ENVIRONMENTAL HEALTH AND SAFETY

KNOWN CONFINED SPACES ON CAMPUS

NON-PERMIT REQUIRED CONFINED SPACES	LOCATION	POTENTIAL HAZARD(S)
1. Steam Tunnels: • HPS, MPS, CW, oxygen, HTHW, natural gas, medium voltage, telephone • HTHW, CW, condensate return, HPS, nat. gas, dom. water, medium voltage, No. 2 fuel oil, telephone	East Campus Heating/Cooling Plant to N-8 Level Throughout West Campus	
2. Soffet	HSC	
3. Low-Level Counting Room	Sub-basement ESS	
4. Amalgam Storage Pit	School of Dental Medicine	
5. Sump	Flax Pond	
PERMIT-REQUIRED CONFINED SPACES	**LOCATION**	**POTENTIAL HAZARD(S)**
1. Utility Manholes:		
• Low voltage	Campus Wide	Fall, Electrical, Asbestos
• Medium voltage (12,800 V)	Campus Wide	Fall, Electrical, Asbestos
• Hot temperature hot water	Campus Wide	Fall, Minimal Asbestos, Heat Stress
• Sanitary sewer	Campus Wide	Fall, Hazardous Atmosphere
• Storm drain	Campus Wide	Fall

• Telecommunication	Campus Wide	Fall
2. HVAC Supply/Return Ducts	Most Buildings	Fall, Entrapment
3. Van de Graaff Accelerator	Van de Graaff	Hazardous Atmosphere
4. Nuclear Magnetic Resonance (NMR)	Center for Molecular Medicine (CMM)	Hazardous Atmosphere
5. Cooling Tower Fire Control Station Pit	West and East Campus Heating/Cooling Plants (WC - to be abandoned)	Hazardous Atmosphere
6. Cooling Tower Electrical Vault	West Campus Heating and Cooling Plant (to be abandoned)	Electrical
7. Cooling Tower Pump Pit	West Campus Heating and Cooling Plant	Fall
8. Perimeter HVAC Chases	HSC and BST	Fall
9. Ventilation Pit	Physics MER	Hazardous Atmosphere
10. Boilers #1, #2, #3, and #4	East Campus Heating/cooling Plant	Hazardous Atmosphere
11. Deaerators (heater tanks) #1 and #2	East Campus Heating/cooling Plant	Hazardous Atmosphere
12. Cascade Heaters (vertical tanks) #1 and #2	East Campus Heating/cooling Plant	Hazardous Atmosphere
13. No. 2 Fuel oil tanks #1, #2, and #3	East Campus Power Plant Tank Farm	Hazardous Atmosphere
14. Boilers #1, #3, #4 and #5	West Campus Heating and Cooling Plant	Hazardous Atmosphere
15. Deaerators #1 (old) and #2 (new)	West Campus Heating and Cooling Plant	Hazardous Atmosphere
16. Cascade Heaters #1 and #2	West Campus Heating and Cooling Plant	Hazardous Atmosphere
17. Trenching/Excavation Areas	Campus Wide	Engulfment
18. Fountain Cistern	Academic Mall	Hazardous Atmosphere