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| <b>Johns Hopkins Safety Manual</b>          | <i>Policy Number</i>    | <b>HSE 020</b> |
| <i>Subject:</i>                             | <i>Last Review Date</i> | 09/01/09       |
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POLICY

It shall be the policy of the Johns Hopkins Institutions to limit the entry of personnel into areas posing special dangers due to their configuration or other features. Such areas, known as confined spaces, are defined as any space that is large enough and so configured that an employee can bodily enter and perform assigned work; and has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults and pits); and is not designed for continuous employee occupancy.

REFERENCES

This policy is necessary to insure the safety of personnel performing service or maintenance activities in confined spaces and to comply with OSHA 1910.146, Permit-Required Confined Spaces and COMAR 09.12.35.

DEFINITIONS

**Attendant** means an individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant’s assigned duties

**Authorized entrant** means an employee who is authorized by the employer to enter a permit space.

**Confined space** means 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); and
3. Is not designed for continuous employee occupancy.

**Entry** means the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuring work activities in that space and is considered to have occurred as soon as any part of the entrant’s body breaks the plane of an opening into the space.

**Entry permit** means the written or printed document that is provided by the employer to allow and control enter into a permit space.

**Entry supervisor** means the person (such as the employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at the permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section.

**Hazardous atmosphere** means 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 illnesses from one or more of the following causes;

1. Flammable gas or vapor or mist in excess of 10 percent of its lower flammable limit (LFL).
2. Airborne combustible dust at a concentration that meets or exceeds its LFL.
3. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent.
4. Atmospheric concentration of any substance above its PEL.
5. Any other atmospheric condition that is immediately dangerous to life or health.

**Immediately dangerous to life or health (IDLH)** means 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.

**Permit required confined space (PRCS)** means a confined space that has one or more of the following characteristics;

1. Contains or has a potential to contain a hazardous atmosphere; or
2. Contains a material that has the potential for engulfing an entrant; or
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.

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RESPONSIBILITIES

|              |   |
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| Supervisors: | <p>Know the hazards that may be encountered during entry including the mode, signs and symptoms and consequences of over-exposure.</p> <p>Verify that all atmospheric tests have been conducted, necessary equipment (including rescue equipment) for the entry is present, and the entry permit is completely filled out and approved before entry begins.</p> <p>Verify that rescue services are available before entry is attempted.</p> <p>Ensure that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained whenever responsibility for a permit space entry operation is transferred.</p> <p>Terminate the entry and void the permit if circumstances warrant.</p>  |
| Attendants:  | <p>Know the hazards that may be encountered during entry including the mode, signs and symptoms and consequences of over-exposure.</p> <p>Continuously maintain an accurate count of authorized entrants in the permit space and ensure that the means used to identify authorized entrants accurately identifies who is in the permit space.</p> <p>Remain outside the permit space during entry operations until relieved by another attendant.</p> <p>Communicate with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space.</p> <p>Monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space.</p> <p>Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards.</p> <p>Keep unauthorized personnel out of and away from the permit space.</p> <p>Perform non-entry rescues where possible.</p> <p>Perform no duties that might interfere with monitoring and protecting authorized entrants.</p> |
| Entrants:    | <p>Know the hazards that may be encountered during entry including the mode, signs and symptoms and consequences of over-exposure.</p> <p>Properly use equipment as required.</p> <p>Communicate with attendant as necessary to enable the attendant to monitor entrant status and alert entrant of the need to evacuate the space as required.</p> <p>Alert the attendant whenever:</p> <ul style="list-style-type: none"> <li>- any warning sign of a dangerous situation or symptom of over-exposure is recognized; or</li> <li>- the entrant detects a prohibited condition.</li> </ul> <p>Exit the permit space whenever;</p> <ul style="list-style-type: none"> <li>- an order is given to evacuate.</li> <li>- any warning sign of a dangerous situation or symptom of over-exposure is recognized,</li> <li>- a prohibited condition is detected.</li> </ul>  |

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- an evacuation alarm is activated.

Health, Safety & Environment (HSE):

Develop and periodically review the policy for permit-required confined spaces.

Identify and maintain an inventory of Permit Required Confined Spaces at JHI Facilities.

Conduct atmospheric monitoring when requested and determine atmospheric testing frequency.

Conduct a hazard assessment of each space.

Approve all Entry Permits.

Inspect confined space entries on a regular basis.

Suspend entries that are in violation of OSHA, COMAR, or JH Policies.

Retain each canceled permit for at least one year to facilitate an annual review of the program.

Provide training for JH personnel as required.

Facilities:

Ensure personnel are trained before they are assigned to work as supervisors, attendants or entrants in permit required confined spaces.

Provide equipment necessary to work in confined spaces.

Within the hospital, linen chutes are considered confined spaces and are only allowed to be entered by the Facilities Department when there is a blockage or any other type of work needs to be done.

Where practical, post signage on entrances to permit required confined spaces.

Notify HSE when they or contractors will be conducting confined space work.

## PROCEDURES

### FOR WORK IN A PERMIT REQUIRED CONFINED SPACE:

- Facilities notifies HSE 24 hours in advance that permit required confined space work will be performed. Under normal conditions, entry will not be approved during non-business hours.
- An Entry Supervisor is appointed by Facilities.
- The Entry Supervisor will select employees to participate in the Confined Space operation and assign them the roles of Entrants or Attendants, ensuring that the employees have had the required training.
- On the day of the entry, the supervisor will complete Section I of the permit.
- A representative of HSE will conduct initial atmospheric monitoring and a hazard evaluation before signing Section II of the permit.
- The Entry Supervisor will review and sign Section III of the Permit.
- For most Permit Required Confined Space entries, the entrant shall wear a full body harness and retrieval line. If the entry involves a vertical type permit space over 5 feet in depth, a mechanical retrieval device is also required. On a case by case basis, HSE may waive these requirements if the retrieval equipment would increase the risk of entry or would not contribute to the rescue of the entrant.
- If the only hazard is an atmospheric hazard that can be controlled by forced air ventilation, alternative entry procedures may be authorized by HSE.
- If all hazards have been eliminated before entry operations begin, the space may be reclassified as a non-permit space by HSE. A written certification containing the date, the location of the space and the signature of the certifying individual must be made available to each employee entering the space.

### PROCEDURES FOR CONCLUDING OPERATIONS

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- All Entrants will exit the space, removing any equipment or tools that were taken into the space as part of the operation.
- Entrances to the space will be closed (and locked or secured as appropriate).
- The Entry Supervisor will terminate the permit, inform the rescue service that operations are complete and note any problems that occurred during Confined Space operations.
- Equipment will be cleaned, necessary maintenance performed, and returned to its proper storage location.

#### PROCEDURES FOR EMERGENCY SITUATIONS

Confined Space operations will normally continue until the work is completed. However, if emergencies occur, the following steps will be taken:

1. The Attendant, upon recognizing that an emergency situation exists, will notify all Entrants to evacuate the space.
2. The Attendant will contact The Baltimore City Fire Department (dial 911) for assistance; inform the dispatcher that a confined space emergency exists and request Rescue Company 1 be dispatched.
3. The Attendant will determine the need for entrant rescue.
4. The Attendant will attempt to rescue without entering the space.
5. The Attendant will assist emergency responders by providing them information that will be helpful to their rescue attempts, including:
  - a. Information on the Entry Permit
  - b. Observations of the situation
  - c. Information provided to the Attendant by the Entrants
  - d. Any other pertinent information
6. Once rescue of the Entrants is completed, the Entry Supervisor will obtain and forward to responders and medical personnel any information that would be helpful to them in providing medical treatment, including information such as Material Safety Data Sheets (MSDS) for any chemical to which Entrants have been exposed.
7. The Entry Supervisor will immediately cancel the Entry Permit, noting the nature of the problem.

#### CONTRACTOR INVOLVEMENT

When outside contractors will be involved in Confined Space operations, the following procedures will be followed:

1. Before a contractor begins any work involving a confined space at JHMI, a representative from HSE will ensure the contractor complies with 29 CFR 1910.146 including such items as a written permit system, training records, ventilation equipment, and rescue equipment.
2. The Contractor will inform HSE of all potential Permit Required Confined Space work. If the space is a PRCS, HSE will inform the contractor of the following:
  - a. That the space is a "Permit-required" space and entry must be in compliance with OSHA 1910.146
  - b. The space's known hazards
  - c. Any past experience with hazards in the space
  - d. Precautions and procedures that are necessary to protect personnel in and around the space
3. The contractor will be responsible for all air monitoring, both initial and periodic.
4. When the contractor's work is complete, a copy of the contractor's Entry Permit will be filed by the Contractor Entry Supervisor with HSE and any problems noted.
5. HSE will make periodic visits to worksites where confined space operations are being conducted.

#### EMPLOYEE TRAINING

Training shall be provided to employees to obtain the understanding, knowledge and skills necessary for the safe performance of duties in permit required confined spaces. Employees shall be retrained whenever there is a change in permit space operations, or employees appear to be deviating from required procedures.

The training programs for workers in and around confined spaces will contain the following:

1. General conduct for all employees
  - a. hazard recognition
  - b. specific types of confined spaces at the location
  - c. reason for proper use and limitations of PPE and safety equipment
  - d. ventilation
  - e. atmospheric testing

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- f. equipment use
- g. explanation of the permit system
- h. communication procedures
- i. First Aid/CPR
2. Training for emergencies, including the procedures to be followed and equipment to be used.
  - a. Entrants
    1. equipment use
    2. evacuation
    3. isolation of hazards (JHH Facilities Lockout/Tagout Policy and Procedure)
  - b. Attendants
    1. control of access
    2. observation of entrants behavior
    3. emergency procedures
  - c. Supervisors
    1. determining acceptable entry conditions
    2. authorizing entry
    3. overseeing entry operations
    4. terminating entry
3. Training for personnel who will conduct atmospheric monitoring.
  - a. Order of monitoring
  - b. Permissible exposure levels
  - c. Ventilation
  - d. Hazard Assessment (Lock Out/ Tag Out, Electricity, Heat Stress, etc)
  - e. Monitoring equipment

#### SUGGESTED EQUIPMENT INVENTORY FOR PRCS ENTRY

- mechanical ventilator with flexible ducting
- oxygen meter
- combustible/toxic gas meter
- entry permits
- checklist
- flashlight
- tool bucket
- rope
- two-way communicator
- tank/hole entry tools
- hard hats
- insulated gloves
- safety glasses
- appropriate phone numbers
- safety barrier and cones
- mechanical retrieval device
- full body harness
- retrieval lanyard
- ladder

#### REVIEW CYCLE

Annual

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**Confined Space Entry Operations Log**

The following "Entry Permits" have been issued for Confined Space work to be done in our facility. Each Permit is logged with the Permit Number, date and disposition of the project (canceled, completed satisfactorily, problems experienced, etc).

|     | Permit Number | Date Issued | Disposition |
|-----|---------------|-------------|-------------|
| 1.  | _____         | _____       | _____       |
| 2.  | _____         | _____       | _____       |
| 3.  | _____         | _____       | _____       |
| 4.  | _____         | _____       | _____       |
| 5.  | _____         | _____       | _____       |
| 6.  | _____         | _____       | _____       |
| 7.  | _____         | _____       | _____       |
| 8.  | _____         | _____       | _____       |
| 9.  | _____         | _____       | _____       |
| 10. | _____         | _____       | _____       |
| 11. | _____         | _____       | _____       |
| 12. | _____         | _____       | _____       |
| 13. | _____         | _____       | _____       |
| 14. | _____         | _____       | _____       |
| 15. | _____         | _____       | _____       |
| 16. | _____         | _____       | _____       |
| 17. | _____         | _____       | _____       |
| 18. | _____         | _____       | _____       |
| 19. | _____         | _____       | _____       |
| 20. | _____         | _____       | _____       |

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**CONFINED SPACE ENTRY PERMIT**

|   |           |       |   |  |  |   |
|---|-----------|-------|---|--|--|---|
| SECTION I (Supervisor to complete each line and sign)   |           |       |   |  |  | Permit No _____                               |
| Space to be Entered: _____  |           |       | Purpose of Entry: _____   |  |  |   |
| Location: _____   |           |       | Authorized Duration of Permit: Date: _____ to _____<br>Time: _____ to _____ |  |  |   |
| <b>PREPARATION FOR ENTRY:</b><br>Identify hazards associated with entry:<br>_____<br>_____ Notification of affected departments of service interruption<br>_____ Isolation methods/Permits completed (circle method or list other)<br>Hot work permit    Lockout/Tagout    Drain    Barriers    Ventilate |           |       |   | <b>COMMUNICATION PROCEDURES:</b><br>To be used by Entrants and attendants (radio, voice, cell, other)<br>_____<br>Authorized Entrant(s) (List by name) _____<br>_____<br>Authorized Attendant(s) (List by name) _____<br>_____<br>Supervisor Approval: _____ |  |   |
| <b>PERSONNEL AWARENESS:</b><br>_____ Pre-entry briefing on specific hazards and control methods<br>_____ Notify contractors of permit and hazard conditions   |           |       |   |  |  |   |
| <b>EMERGENCY RESCUE SERVICE:</b><br>_____ Rescue Service informed of entry- 410-396-5163/7<br>Name of service    Emergency #    Method of Contact<br>BCFD Rescue Co. 1    911    Telephone  |           |       |   |  |  |   |
| SECTION II (HSE to complete and sign)   |           |       |   |  |  |   |
| Air Monitoring : Acceptable limits Oxygen 19.5-23.5%, flammable <10% LFL, Toxics < PEL/TLV/REL  |           |       |   |  |  |   |
| Time  |           |       |   |  |  | Air monitoring frequency: _____               |
| O <sub>2</sub>  |           |       |   |  |  | Ventilation requirements: _____               |
| LEL   |           |       |   |  |  | Personal protective equipment required: _____ |
| CO  |           |       |   |  |  | Self-rescue equipment required: _____         |
| H <sub>2</sub> S  |           |       |   |  |  | HSE approval: _____                           |
| Other   |           |       |   |  |  |   |
| SECTION III   |           |       |   |  |  |   |
| <b>AUTHORIZATION BY ENTRY SUPERVISOR</b>  |           |       |   |  |  |   |
| I certify that all required precautions have been taken and necessary equipment is provided for safe entry and work in this confined space.   |           |       |   |  |  |   |
| Printed Name  | Signature | Date  | Time  |  |  |   |
| _____   | _____     | _____ | _____   |  |  |   |
| <b>THIS PERMIT MUST BE POSTED ON JOB SITE. GOOD ONLY FOR DATE AND TIME INDICATED</b>  |           |       |   |  |  |   |