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C-A OPERATIONS PROCEDURES MANUAL

8.14 Confined Space Entry Procedure

Text Pages 2 through 5

Attachments

Hand Processed Changes

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Approved: _____ ***Signature on File*** _____
Collider-Accelerator Department Chairman Date

A. Etkin

8.14 Confined Space Entry Procedure

1. Purpose

The purpose of this procedure is to define the steps that must be taken prior to entering any confined space in the C-A Complex that has been rated as Class 2, or any Class 1 space, into which a hazard may be introduced due to the work being performed.

2. Responsibilities

2.1 The ES&H Coordinator is responsible for:

- 2.1.1. maintaining an inventory of all Class 2 confined spaces on the C-A Department web page, and providing this inventory to BNL Fire-Rescue and Safety & Health Services Division Industrial Hygiene Group;
- 2.1.2. ensuring that all Class 2 confined spaces are posted with the correct sign, or have other means in place, such as bolts, locks or barriers, to prevent unauthorized entry;
- 2.1.3. approving all Class 2C confined space entries, using the Confined Space Entry Permit, such as the example shown in [C-A-OPM-ATT 8.14.c](#), and maintaining a record of the entry permits.

2.2 The Entry Supervisor and Building Manager for the area is responsible for:

- 2.2.1 Building Manager shall ensure that any possible confined spaces in their areas are reviewed annually for condition changes and that the changes are forwarded to the ES&H Coordinator as applicable;
- 2.2.2 the Entry Supervisor shall approve all entries into Class 2A and 2B confined spaces via the Confined Space Entry Certification, as per [SBMS Confined Space Certificate](#).
- 2.2.3 the Entry Supervisor shall assure that any required atmospheric monitoring is conducted by workers qualified in using the monitoring equipment;
- 2.2.4 the Entry Supervisor shall assure that the confined space entry is posted properly as specified in Section 5, Procedure.

3. Prerequisites

- 3.1 While work is underway and an abnormal condition arises, re-review the job against criteria in applicable SBMS Subject Areas, and/or work planning requirements. If unsure of further actions, discuss situation with supervisor.

- 3.2 Anyone entering a Class 2 confined space shall have valid Confined Space Training, HP-OSH-016.
- 3.3 Any conditions making it unsafe to remove an entrance cover shall be eliminated before the cover is removed.
- 3.4 Certain equipment (such as TVDG) or experimental set-ups (such as Cerenkov counters), that use a hazardous or combustible gas, may have specific procedures written for venting and monitoring the atmospheric levels in their confined spaces. These procedures shall be reviewed and approved by the ESSHQ Division prior to entering those spaces.

4. Precautions

- 4.1 Some confined spaces have pre-entry requirements, such as atmospheric testing/monitoring. These requirements must be strictly adhered to. Atmospheric conditions that could present a hazard in confined spaces are:
 - a. Oxygen deficiency – less than 19.5% oxygen (normal is 20.9%)
 - b. Oxygen excess – greater than 23.5% oxygen
 - c. Explosive/Flammable gases – gas concentrations equal to or greater than 10% of the Lower Explosive Limit (LEL), sometimes referred to as the Lower Flammable Limit (LFL).
 - d. Toxic gases – if any toxic gas is suspected, a specific testing/monitoring program must be developed through use of the Work Permit, and Confined Space Entry Certification (contact the ES&H Coordinator).
- 4.2 Any confined spaces that are classified as 2C, either by the confined space itself or because of the work being performed in the space, also requires a Confined Space Entry Permit, in accordance with [SBMS – Confined Spaces](#) (contact the ES&H Coordinator). Any hot work in a confined space elevates the space to a 2C confined space.
- 4.3 If any conditions change during the confined space entry, all entrants must exit the space. The Entry Supervisor and ES&H Coordinator shall re-evaluate the space prior to any subsequent entries.
- 4.4 If work in any confined space is interrupted, all entry conditions shall be re-evaluated before work is resumed.
- 4.5 It is recommended that the Entry Supervisor insure that periodic contact be made with entrants in Class 2A and 2B confined spaces.

5. Procedure

CAUTION

1. As per the confined spaces subject area, when the entry cover is opened on a Class 2A, 2B or 2C confined space (e.g. manhole cover, pit cover, etc) the sign on Attachment 1 shall be easily visible to all persons approaching the opening. This may require adding this sign since if it is normally on the manhole cover and the cover is open, the sign is no longer visible to approaching personnel.
2. During entry, the confined space Certification or Permit shall be posted at the entry point.
3. If possible, the entry manhole shall be closed and bolted with at least one bolt after working hours to prevent unauthorized personnel from entering the space.

- 5.1 Workers and Entry Supervisors preparing to enter a confined space shall evaluate the work and the confined space, using the SBMS Confined Space Entry Certification (CSEC) form or equivalent. A listing of C-A Confined Spaces is on the C-A Department web page [Confined Space List](#).
- 5.2 If atmospheric testing is required for the confined space, it shall be performed by workers qualified on the specific instrument to be used.
 - 5.2.1 Pre-operational checks should be performed once per day before the instrument is used, based on the potential hazard of the confined space. If oxygen deficiency is the only potential hazard in the space, the oxygen sensor can be tested by blowing into the sensor and watching for meter response. If other gases are potentially present, the equipment can be checked using a test gas available from the ES&H Coordinator.
- 5.3 If ventilation is required by the CSEC or Confined Space Entry Permit, employees may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere. The ventilation shall be directed to the immediate area where the employees will be working, and should direct the possible contaminant(s) away from the worker's breathing zone.
- 5.4 Lockout and Tagout of all hazardous energy sources shall be done in accordance with [C-AD OPM-C-A-2.36, Lock and Tag Program for Control of Hazardous Energy](#).
- 5.5 All electrical equipment being used in a confined space shall be protected by a Ground Fault Circuit Interrupter (GFCI), or be double insulated.
- 5.6 If the evaluation of the confined space determines that the space is, or will be, a Class 2C, a Confined Space Entry Permit shall be initiated by the Entry Supervisor

and ES&H Coordinator, to control work in the space. The Confined Space Entry Permit shall include the following information:

- the space to be entered and the purpose of entry
- date and duration of the permit
- attendant, entry supervisor, and all entrants
- hazards in the space
- measures used to eliminate or control hazards before entry
- acceptable entry conditions and means of verifying conditions
- means of summoning the BNL Fire/Rescue Group
- communication procedures to be used
- PPE and rescue equipment, if applicable
- any additional permits issued for work in the space

5.7 All employees entering confined spaces shall comply with the requirements of [SBMS – Confined Spaces](#).

5.8 It is recommended that the Entry Supervisor insure that periodic contact be made with entrants in Class 2A and 2B confined spaces.

6. Documentation

6.1 Confined Space Entry Certification forms shall be completed for each entry into a Class 2A or 2B confined space. This form shall be filed by the Entry Supervisor and retained for one year.

6.2 The Department/Division retains cancelled 2C permits a minimum of 1 year or until incorporated into the SME review of cancelled permits.

7. References

7.1 [SBMS Subject Area, Confined Space](#)

7.2 [SBMS Subject Area, Lockout/Tagout \(LOTO\)](#)

7.3 [C-AD OPM-C-A-2.36, Lock and Tag Program for Control of Hazardous Energy.](#)

8. Attachments

8.1 [C-A-OPM-ATT 8.14.c, “Example of a Confined Space Entry Permit”](#)

8.2 Attachment 1, Confined Space Sign

ATTACHMENT 1
Confined Space Sign

