HOWE SOUND
PULP & PAPER CORPORATION
A PAPER EXCELLENCE COMPANY

JOINT SAFETY MANAGEMENT SYSTEM
CONFINED SPACE PROGRAM

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1. INTRODUCTION

The hazards associated with confined spaces have been responsible for many fatal and serious injuries to workers and would-be rescuers. The most common underlying cause of these accidents is insufficient preparation for undetected hazards (i.e., invisible hazards). These hazards associated with confined spaces include, but are not limited to, bridging of material, electrical hazards, falling from an elevation, potential entrapment and engulfment, radiation, fire or explosion, hazardous atmosphere such as flammable, toxic gases or vapors, oxygen deficiency or enrichment, asphyxiation or suffocation, or other serious safety and health hazards.

This program applies to all HSPP employees, visitors, and contractors while on site at the HSPP facility.

No workers shall enter a “confined space” in which a harmful atmosphere exists or may develop until the following are conducted:

- a formal written Confined Space Hazard Assessment has been completed, and
- written work procedures have been established and reviewed to ensure a safe environment for workers, and
- confined space entry lockout and isolation has been completed, and
- atmospheric testing/monitoring of the environment to determine the nature and quantity of harmful vapors, gases, fumes, mists, dusts, and oxygen deficiency have been made and recorded.
- pre-entry rescue plans are in place as required.

At HSPP, there are many confined spaces that are entered to perform maintenance work, repairs, cleaning, testing, and other activities. This Confined Space Entry Program has been developed in conjunction with the Lockout and Isolation Program, Fall Protection Program, and Respiratory Protection Program in order to control, minimize, and eliminate hazards so that work is performed safely. The Confined Space Entry Program was also developed and implemented to comply with section 9.5 of the Worksafe BC Occupational Health and Safety Regulation.

2. DEFINITIONS

"adjacent piping"……	means a device such as a pipe, line, duct or conduit which is connected to a confined space or is so located as to allow a substance from within the device to enter the confined space;
"atmosphere"	means the gases, vapors, mists, fumes, and dusts within a confined space.
"blanking or blinding".....	means the absolute closure of a pipe, line or duct by the fastening of a solid plate that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line or duct with no leakage beyond the plate.
"clean respirable air"	when used to describe the atmosphere inside a confined space, means an atmosphere which is equivalent to clean, outdoor air and which contains (a) about 20.9% oxygen by volume, (b) no measurable flammable gas or vapor as determined using a combustible gas measuring instrument, and (c) no air contaminant in concentrations exceeding either 10% of its applicable exposure limit in Part 5 (Chemical and Biological Substances) or an acceptable ambient air quality standard established by an authority having jurisdiction over environmental air standards, whichever is greater.
"combustible dust".....	means a dust capable of undergoing combustion or burning when subjected to a source of ignition.
"combustible gas".....	means the airborne concentration of gas or vapor, which may present the risk of fire or explosion if an ignition source of sufficient energy, is introduced. This term also applies to all flammable vapor and explosive gases.
"confined space"	means an area, other than an underground working, that (a) is enclosed or partially enclosed, (b) is not designed or intended for continuous human occupancy, (c) has limited or restricted means for entry or exit that may complicate the provision of first aid, evacuation, rescue or other emergency response service, and (d) is large enough and so configured that a worker could enter to perform assigned work.
"confined space permit".....	Means the written or printed document that is provided by the employer to allow and control entry into a confined space. The determination of whether a permit is required for entry into the confined space is based on the criteria outlined in Flowchart #2.
"double block and bleed".....	Means the closure of a line, duct, or pipe by closing and locking of two in-line valves and by opening and locking a drain or vent valve in the line between the two closed valves.
"emergency".....	Means any occurrence (including a failure of hazard control or monitoring equipment) or event, external or internal to the confined space that could endanger entrants.
"engulfment".....	means the surrounding and effective capture of a person by a liquid or a finely flowing solid substance that can be aspirated or cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.
"entrapment"	means a condition where an uninjured person is unable to remove himself or herself, or any body part, from a confined space. Entrapment occurs as a result of the configuration of a confined space and is often associated with converging or convoluted surfaces.
"entry"	Means the action by which a person passes through an opening into a confined space. Entry includes work activities in that space and is considered to have occurred as soon the breathing zone of an entrant's body breaks the plane of an opening into the space.

2. DEFINITIONS (cont'd)

"entry/area supervisor".....	Means the person responsible for determining if acceptable entry conditions are present at a confined space where entry is planned and to authorize entry. For those confined spaces requiring a permit, he/she will also oversee entry operations, ensure the permit has been completed correctly, sign the permit, and terminate entry as required.
"flammable or explosive limits"..	means the range of concentrations of a flammable vapor and air mixture over which the mixture can be ignited. The Lower Explosive Limit (LEL) and the Upper Explosive Limit (UEL) designate this range. Flammable limits are expressed as a percent volume of vapor in air.
"harmful substance".....	means a WHMIS controlled product, a substance listed in Table 5-4 in Part 5 (Chemical and Biological Substances), or a substance which may have a harmful effect on a worker in a confined space.
"hatch watch attendant" (Standby or Outside person).....	means the trained individual stationed outside one or more confined spaces who monitors the authorized entrants and who performs all attendant duties assigned in the Joint HSPP confined space program. The determination of whether a hatch watch attendant (Outside person) is required for entry into the confined space is based on the criteria outlined in flowchart #2.
"high hazard atmosphere".....	means an atmosphere that may expose a worker to risk of death, incapacitation, injury, acute illness or otherwise impair the ability of the worker to escape unaided from a confined space, in the event of a failure of the ventilation system or respirator.
"hot work".....	means all electric welding, air arcing, grinding, disc cutting, high temperature heating, "open flame" burning and/or welding, hot patch roofing, or any other work that creates sufficient heat to ignite combustible/flammable materials.
"IDLH atmosphere".....	means an atmosphere containing a substance at a concentration which is immediately dangerous to life or health (IDLH) because the concentration is greater than that from which one could escape without any escape-impairing symptoms or irreversible health effects, and includes an atmosphere with an unknown concentration with the potential to be immediately dangerous to life or health.
"isolation".....	Means the process whereby the confined space is removed from service and is completely protected against an inadvertent release of material. Examples are blanking of lines, lockout of electrical systems, and disconnecting of mechanical linkages.
"low hazard atmosphere".....	means an atmosphere which is shown by pre-entry testing or otherwise known to contain clean respirable air immediately prior to entry to a confined space and which is not likely to change during the work activity, as determined by a qualified person after consideration of the design, construction and use of the confined space, the work activities to be performed, and all engineering controls required by the WORKSAFE BC Occupational Health & Safety Regulation.
"moderate hazard atmosphere".	means an atmosphere that is not clean respirable air but is not likely to impair the ability of the worker to escape unaided from a confined space, in the event of a failure of the ventilation system or respirator.
"non-permit required entry".....	means a confined space that does not contain a recognized acute hazard and does not have the potential to contain any hazard causing death or serious harm. The determination of whether a confined space is a non-permit required entry is based on the criteria outlined in Flowchart #2.
"oxygen deficient".....	means, in relation to air, a condition in which there is less than 19.5% oxygen by volume, or the partial pressure of oxygen is less than 16.3 kPa (122 mm Hg).
"purging".....	Means the method by which gases, vapors, or other airborne impurities are displaced from a confined space.

2. DEFINITIONS (cont'd)

"qualified".....	means being knowledgeable of the work, the hazards involved and the means to control the hazards, by reason of education, training, experience or a combination thereof.
"qualified person".....	means a person who has adequate training and experience in the recognition, evaluation and control of confined space hazards. Qualifications which are acceptable as evidence of adequate training and experience include (a) certified industrial hygienist (CIH) or registered occupational hygienist (ROH), (b) certified safety professional (CSP), Canadian registered safety professional (CRSP), or professional engineer (P.Eng), provided that the holders of these qualifications have experience in the practice of occupational hygiene as it relates to confined space entry, or (c) other combination of education, training and experience acceptable to the board.
"rescue procedures".....	Means the pre-determined written set of actions that are to be taken when a rescue is necessary.
"retrieval system".....	Means the system (including a retrieval line, full body harness, and a lifting device or anchor) used for non-entry rescue of persons from a confined space.
"trainer"	Means the person who has sufficient training, experience, and expertise in the Confined Space program to adequately carry out specified training assignments as determined by the qualified person.
"work induced hazard".....	Means the hazard(s) created due to the nature of the work being performed within the space. Examples include welding or painting that could create adverse conditions such as fumes or gas.

3. REGULATIONS

WORKSAFE BC OCCUPATIONAL HEALTH & SAFETY REGULATION
Part 9..... Confined Spaces
Part 10..... De-energization and Lockout
Part 5..... Chemical and Biological Substances
Part 11..... Fall Protection

WORKSAFE BC OHS GUIDELINES,
Part 9..... Confined Spaces
Part 10..... De-energization and Lockout
Part 5..... Chemical and Biological Substances
Part 11..... Fall Protection

WORKERS COMPENSATION ACT, 1999
Section 115 ..... General Duties of Employers
Section 116 ..... General Duties of Workers
Section 117 ..... General Duties of Supervisors
Section 118 ..... Coordination at Multiple-Employer Workplaces
Section 120 ..... General Duties of Suppliers

4. RESPONSIBILITIES

Participants involved in implementing and executing this Confined Space Entry Program include:

1. Confined Space Entry Program Administrator (Health & Safety Superintendent)
2. Members of the Joint OH&SC through the Confined Space Committee
3. Area Supervisor in charge of Confined Space Entry
4. Entrants into confined spaces (e.g., welders, pipe fitters, millwrights, testing workers, etc.)
5. Hatch Watch Attendant (or Outside Person)
6. Qualified Person (see definition)
7. Contractors (i.e., Boiler Makers, INDT, Scaffolders, etc.)
8. Rescue Personnel (i.e., Emergency Response Team, First Aid Services, Fire Fighters)

1. Confined Space Entry Program Administrator (Health & Safety Superintendent):

The Program Administrator is responsible to oversee the entire Confined Space Entry Program at Howe Sound Pulp & Paper. This entails the following duties:

- Coordinate the confined space entry program,
- Ensure the effective operation of the confined space program by keeping current with issues pertaining to confined space entry,
- Work with the hazard assessment teams conducting and completing the hazard assessments for confined spaces and sign-off as approved,
- Assist in the development and implementation of the written confined space entry work procedures as required,
- Ensure records and documentation are maintained pertaining to the confined space entry program,
- Ensure worker education and training programs are current (work with the Training Department).
- Ensure departments review their CS inventories and update the information annually or as required to ensure the information is current and accurate (work with area personnel).
- Coordinate and ensure that an annual review or audit is conducted of the confined space program to ensure the effective operation as well as keeping in compliance with regulatory requirement such as Part 9 of the Worksafe BC OH&S Regulation.

4. RESPONSIBILITIES (cont'd)

2. Members of the Joint Occupational Health & Safety Committee (JOHSC)

The JOHSC is to review the program annually and offer input into the direction of the confined space entry program through the active participation and involvment of the Confined Space Sub-Committee. The Confined Space Sub-Committee may review or recommend changes to all, or parts of the HSPP Confined Space Entry Program to make it a more viable means of protection for both employees and equipment.

3. Entry/Area Supervisor in charge of Confined Space Entry

- Ensure the health and safety of all workers under his/her direct supervision,
- Ensure workers under his/her direct supervision are aware of the potential health and safety hazards in their work site/area,
- Consult with the Confined Space Entry Program Administrator in the coordination of activities of confined space entry as required,
- Consult with the Hatch Watch (Outside Person) in the issuing of the Entry Permit, if required,
- Ensure Entrants and Hatch Watch (Outside Person) are competent, knowledgeable, and understand their duties and requirements in this program, as required,
- Ensure only authorized workers enter the confined space,
- Coordinate all work and communication between all groups involved in confined space activities (including contractors),
- Verify that all personnel (including contractors) involved in the entry have been informed of the specific hazards (including short and long term symptoms of exposure to the potential hazards which may exist in the confined space),
- Review the CS entry permit or safe work procedures to ensure that they contain all the required information and approvals, and that the necessary plans and equipment for safe entry and rescue are in effect before signing the permit,
- Ensure all appropriate personal protective equipment (PPE) has been selected, is used, and disposed or stored as required.
- Ensure the necessary equipment and procedures are ready to evacuate workers from the confined space in the event of an emergency.
- Ensure a pre-meet has been conducted & documented using the Pre-Meet Checklist with all entrants, hatch watch personnel and rescue personnel, as required. (see Section 9 – Developing Safe Work Procedures: Entry Preparations)
- Sign-off on the permit prior to worker entry.
- Suspend the CS entry permit or safe work procedure if conditions in the confined space changes as deemed by Hatch Watch, and

- Ensure all personnel in the confined space have been evacuated as per procedures if the CS entry permit or safe work procedure is suspended or if unsafe conditions occur.

4. RESPONSIBILITIES (cont'd)

4. Entrants into Confined Spaces

Entrants may include welders, pipe fitters, millwrights, testing workers (INDT), boiler workers, etc.

- Visually check/inspect the work area to ensure the work environment is safe for entry (i.e., ask about, or perform pre-entry air testing, ventilation, etc.) for yourself as well as for other entrants,
- Follow and comply with written safe work procedures,
- Ensure the Gatehouse is notified when you are entering a non-permitted Confined Space as per safe work procedures,
- Must have successfully completed Part 1 of the Confined Space Training,
- Know the hazards which may be encountered (from the work activities generated inside the confined space such as welding fumes and flashes from welding),
- Wear the necessary personal protective equipment (PPE) as specified in the written safe work procedures,
- Recognize the signs and symptoms of exposures and extent of the hazards and understand the consequences of these exposures,
- As required, notify Hatch Watch (Outside Person) when hazardous conditions exist that are unacceptable or when signs and symptoms of exposure develop,
- Be able to exit the space by the quickest means possible when ordered by the Hatch Watch (Outside Person) or when the emergency alarm is activated, or when signs and symptoms of exposure exist,
- Perform required testing in work areas as outlined in this program and specific safe work procedures,
- Not engage in horseplay or similar conduct that may endanger oneself or other workers,
- Ensure you are physically and mentally capable of performing the work or job without endangering yourself and other workers,
- Inform your immediate supervisor or the Hatch Watch (Outside Person) of equipment or structural defects so that necessary actions and steps can be taken to rectify the problem and prevent re-occurrence,
- Cooperate with health & Safety personnel
- Participate in the pre-meet with entry supervisor, hatch watch personnel and rescue personnel, as required. (See Section 8 – Developing Safe Work Procedures: Entry Preparations)

- If entry is required by a person who did not attend the initial pre-meet, the new entrant is to review pre-cautions with Entry Supervisor and sign off on the pre-meet checklist.
- Ensure that you have checked in with the Hatch Watch EVERY time you enter and exit the Confined Space.

4. RESPONSIBILITIES (cont'd)

5. Hatch Watch (Outside Person) – If required

- **NEVER ENTER THE CONFINED SPACE FOR ANY REASONS, EVEN FOR EMERGENCY RESCUES,**
- Must have completed a minimum of annual training in Confined Space Entry procedures and operation of associated equipment (i.e. monitoring equipment, ventilation)
- Call and test the communication with the Gatehouse before entry and notify gatehouse at the conclusion of confined space entry,
- Monitor activities inside the space,
- Wear the necessary personal protective equipment (PPE) as specified in the written safe work procedures,
- Follow and comply with written safe work procedures,
- Conduct continuous air testing/monitoring where necessary,
- Recognize potential confined space hazards so that hazards inside and outside the confined space can be monitored to ensure conditions are safe for Entrants to remain in the confined space,
- Know the exact name, location, and identification of the confined space as well as the location of the nearest operable telephone, eyewash/shower facility, and first aid services,
- Monitor the entry and exit of all Entrants and maintain an accurate count of all persons inside the space,
- Maintain the ability to communicate (either visually or voice) with Entrants inside the confined space to check their well-being continuously or at least every 20 minutes or more often (as required by specific procedures),
- Understand the operation of the ventilation systems for the confined space. For example, how the ventilation is provided, location of exhaust and intake vents, and the correct course of action to be taken if ventilation system fails.
- Prevent unauthorized workers (did not meet pre-meet requirements) from entering the space and post warning signs and tape off entry points as appropriate. (e.g., "Confined Space, Authorized Entry Only") if entry is no longer allowed,
- Ensure that prior to securing a Confined Space, that a last check is made to ensure all entrants have left the space. This check will require both a visual inspection and an audible "call out" or "whistle check" (as established through the pre-Meet) to confirm the space is unoccupied.

4. RESPONSIBILITIES (cont'd)

- Order or instruct the Entrants to exit the confined space if the entry permit is suspended, emergency conditions develop in the area, or if any of the following may occur:
    - Conditions observed to exist that are not described in the entry permit or
    - Situations detected outside or within the confined space that would endanger the lives of the Entrants,
- Not transfer your duties to a worker who is unqualified or not trained in these responsibilities and procedures. The duties can only be transferred to a person who is qualified, trained, and briefed in the nature of the work activities and any other appropriate information for this entry,
- Not engage in horseplay or similar conduct that may endanger one self or other workers.
- Ensure you are physically and mentally capable of performing the work or job without endangering yourself and other workers,
- Assist or prevent the entanglement of lifelines and other equipment where necessary,
- Be stationed as close as is practical to the entrance of the confined space in order to accurately monitor the entries and exits,
- Be able to immediately summon the Emergency Response Team (Fire/Rescue) through communication with the gatehouse or by 2222,
- Inform your immediate supervisor of equipment or structural defects so that necessary actions and steps can be taken to rectify the problem and prevent re-occurrence,
- Cooperate with health and safety personnel.
- Participate in the pre-meet with entry supervisor, entrants, and rescue personnel, as required. (see Section 8 - Entry Preparations)

6. <u>Qualified Person (Safety Superintendent or delegate)</u>

See Section B, Definitions. The duties and responsibilities of the qualified person include, but are not limited to:

- Assist in preparing hazard assessments for confined spaces being entered, review and sign off as required,
- Assist in preparing and developing written safe work procedures for workers entering into a confined space, as required
- Consult with the Program Administrator with regards to confined space related issues.

4. RESPONSIBILITIES (cont'd)

7. Contractors

Contractors may include but are not limited to workers that are hired to do any or all work required to construct, maintain, or demolish company equipment or assets.

Contractors (external HSPP personnel) may perform work in confined spaces. Contractors must be advised of the conditions and provided with hazard details of the confined space that they are required to enter. Contractors shall be responsible to:

- Complete the HSPP contractor induction, including the Confined Space and Lockout sections, as required.
- Inform their employees of the hazards associated the confined spaces and other hazards in the vicinity of their workspace that may pose a risk.
- Submit written site specific or confined space site-specific work procedures to HSPP Confined Space Entry Program Administrator, Project Coordinator and/or Health and Safety Superintendent, as required.
- Check with the mill contact to determine if a hazard assessment has been completed for the confined space to be entered and for the work they intend to undertake. If "no", the contractor must make arrangement with their own qualified person and HSPP qualified people to complete a hazard assessment. New site-specific written safe work procedures must be completed before any entry into the confined space is made.
- Ensure all workers have in their possession all required PPE when working on the mill property.
- Ensure that a representative for each contractor inside the Confined Space has signed off on the Contractor permit prior to allowing workers to enter the Confined Space.
- Submit to HSPP Confined Space Entry Program Administrator and/or the Safety Supervisor a list of chemicals or products (under the Hazardous Substance Act) to be used at the mill site/property for approval, along with the completed chain of custody form.
- Conduct a pre-meet with entry supervisor, entrants, hatch watch personnel and rescue personnel, as required and document using the pre-meet checklist (see Section 9 - Developing Safe Work Procedures: Entry Preparations)

4. RESPONSIBILITIES (cont'd)

- Upon request, provide a copy of their confined space entry program to HSPP Confined Space Entry Program Administrator, Project Coordinator and/or Health and Safety Superintendent for review before performing any confined space activities. The confined space entry program and written safe work procedures must include but not limited to:

  - Program Administrator,
  - Identification and entry permits,
  - Lockout and isolation,
  - Verification and atmospheric testing,
  - Cleaning, purging, venting and inerting,
  - Ventilation,
  - Hatch Watch persons,
  - Rescue,
  - Lifelines, harnesses and lifting equipment,
  - Personal protective equipment and other precautions,
  - Coordination of work activities, and
  - Worker education and training (HSPP policy on worker education and training is that workers must be educated and trained within one year prior to commencement of a job).

8. Rescue Personnel

Rescue teams may include but are not limited to the mill's internal Emergency Response Team (Fire/Rescue), and First Aid Services.

The Emergency Response Team is an internal rescue team. Calling the emergency local number 2222 from a local phone or 604-884-2222 from an outside line or cell phone will reach the gatehouse, who will then summon the ERT. The ERT is available 24-hours a day and 7 days a week.

Rescue personnel are responsible for all rescue activities on site in accordance with established procedures and Departmental Operating Guidelines.

Qualified rescue personnel will also be responsible for developing the rescue pre-plans as required by the Hazard Assessments.

5. TRAINING

1. Training Format

1.1. The training format which has been approved for HSPP employees potentially involved in *'Confined Space Entry'* will consist of two (2) parts;

Part I of the *'Confined Space Entry'* training is designed specifically for persons, including Supervisors, who may enter into a *Confined Space* for the purpose of inspections, cleanup, maintenance, or to carry out any other required work. One section of this training allows for delivery of information pertinent to specific groups, such as maintenance trades, operations employees, etc. Current course duration is approximately 3 hours.

Part II of the *'Confined Space Entry'* training is designed specifically for those employees who may assume the duties of an *'Hatch Watch Person'*, and their Supervisors. Course duration will be approximately 1 hour.

1.2. **Part II** of the*'Confined Space Entry'* training, focusing on the duties of the *''Hatch Watch Person'*, will only be offered as a supplement to **Part I** of the *'Confined Space Entry'* training.

5. TRAINING (cont'd)

2.0. Frequency of Training

2.1. In order to maintain awareness of the Program and to ensure employees are updated in regards to any revisions, there will be a 'Refresher' course scheduled annually for employees who have previously attended **Part I** of the *'Confined Space Entry'* training.

2.2. In order to maintain the knowledge necessary to complete the assigned duties and to ensure employees are updated in regards to any revisions, there will be 'Refresher' course for all employees who have previously attended **Part I** and **Part II** of the *'Confined Space Entry'* training. These 'Refresher' sessions will be scheduled at least annually and it is recommended that potential *''Hatch Watch Persons'* be scheduled into one of these annual sessions prior to any Maintenance Shutdown during which they may be designated as an *''Hatch Watch Person'*.

3.0. Personnel to be Trained

3.1. Department Superintendents will identify the employees, including Supervisors, to be trained in either or both **Parts**, based on the foreseeable needs of their respective Departments.

3.2. Requests for Training must be forwarded to the Training Department and Safety Supervisor at least one week prior to the proposed training session date.

6. INVENTORY

Confined Spaces at Howe Sound Pulp & Paper have been identified and clearly marked.

It is the responsibility of the Area Superintendent to ensure the signage identifying Confined Spaces in their area of responsibility is clearly legible.

Each department is responsible to keep an updated list of Confined Spaces on their intranet page under “Lockouts”

7. HAZARD ASSESSMENTS

The objective of hazard assessments is to document and evaluate hazardous conditions (such as those described below) that could be present and/or could develop during work in a confined space. Hazard assessments consider the present and previous uses, processes, and work performed in the space.

Confined spaces, by their nature, possess many hazardous conditions that threaten the health and safety of individuals entering in these spaces for any duration and reasons. These hazardous conditions of confined spaces include:

- Hazardous atmospheres that contain irritants, flammables, asphyxiants, toxins, etc.
- Communication problems,
- Mechanical hazards,
- General safety hazards,
- Entry and exit restrictions,
- Physical hazards (e.g., thermal, noise, vibration, radiation, etc.).

The Hazard Assessment must also identify the specific hazards associated with the work being undertaken in the Confined Space and the control measures required to reduce the risk of injury to acceptable levels.

A review of the hazards must be conducted each time an entry is planned to confirm that details on the use, process, and conditions of the space are current. The “Confined Space Hazard Assessment” and “Pre-Job Hazard Assessment” forms can be found on the mill intranet under “Safety”; “Forms & Templates”.

Completed written hazard assessments are linked and attached to the equipment Lockout procedures.

8. GENERAL ENTRY PREPARATION GUIDELINES (HAZARD CONTROLS)

No attempt must be made to enter a confined space until all hazards identified in the *hazard assessment* are controlled by a combination of engineering controls, procedural or administrative controls and personal protective equipment (PPE). Therefore, proper preparation of the confined space is critical.

Initial Preparation

(i) Isolate the space to prevent inward movement of any materials, substances, or products.
(ii) Drain, purge, vent or flush the space of all materials, substances, or products in it. Flush the feed lines to the confined space (if necessary) to ensure that no product or material enters the space and potentially contaminate the space's atmosphere.
(iii) Close the outlet to secure the backward flow of materials, substances, or products into the space.
(iv) Use caution, wear all necessary PPE (i.e., SCBA, goggles, rubber suits, rubber gloves, etc.), and perform air testing when opening hatches. There may be unknown concentrations of gases or splashes of substances.
(v) Supply fresh air into and exhaust the space to control or eliminate atmospheric hazards as required.

Energy Isolation & Lockout (Lockout Program)

All energy sources identified in the Lockout Hazard Assessment that could pose unacceptable risk to entrants must be isolated and locked out to protect the health and safety of workers entering into these spaces. Each confined space has its own specific lockout procedures and lockout points. Refer to the Lockout Program for further guidelines and/or review specific lockout points and procedures for each confined space.

Lockout and blanking procedures and forms can be found in the HSPP's intranet under each department or area.

Isolation of Energy Sources

1. The closing of one or more valves in a line is not an acceptable means of isolation (except when used in an acceptable double block and bleed system).
2. Control harmful substances contained in adjacent systems by disconnecting, blanking, or blinding/ double block and bleed.
3. Control the area of potential discharge by disconnecting systems to prevent accidental discharges that would pose a hazard to the workers.

8. GENERAL ENTRY PREPARATION GUIDELINES (HAZARD CONTROLS) (cont'd)

Isolation of Energy Sources (cont'd)

4. Lockout all energy sources inside the space or those associated with safe access into the space.

   The following substances ***must*** be treated as hazardous:

   i) All liquids, including water and steam above 130°F or 54°C.
   ii) Air above 15 p.s.i. or 100 kPa
   iii) All substances which are gases at standard temperature and pressure.
   iv) Any substance found in Appendix "A" of the W.C.B. Regulations.
   v) All WHMIS controlled products.

Isolation of Nuclear Devices

All nuclear devices assocatied with Confined Space Entry must be isolated, locked out and verified as effective according to Section 12 of HSPP E/I Procedure # 1005001 'Nuclear Gauge Procedures Manual'.

Blanking and Blinding

Any blanks or blinds used as part of the isolation process to permit confined space entry must be manufactured in accordance with ANSI standards or certified by a Professional Engineer to provide adequate safety for temperature and service applications for a particular confined space.

Blanks or blinds must be clearly identified with its pressure rating.

Blanks & Blinds must also follow HSPP standard procedure - #64600001 – "Blanks and Blinds – Fabrication/Installation Guidelines."

Finally, where lines are opened for disconnection purposes or for the installation of blanks or blinds, written safe work procedures for this must be prepared and followed. Blanking and blinding work procedures can be found in the HSPP's intranet under each department or area.

Visual indication that a blank or blind has been installed must be provided at the point of installation.

8. GENERAL ENTRY PREPARATION GUIDELINES (HAZARD CONTROLS) (cont'd)

Double Block and Bleed

Check to ensure that the following items are in place where double block and bleed isolation systems are used:

- Ensure that bleed valve is not directed towards other workers or into work areas.
- Check the downstream valve to ensure it is capable of safely withstanding the line pressure.
- Place the bleed valve lower (in elevation) than the block valves.
- Ensure the diameter of the bleed line is not less than the diameter of the line being isolated, unless certified by a Professional Engineer.
- Lockout all valves in their proper open or closed position as per Lockout procedure.
- Check the bleed to ensure that it is clear of obstructions while the space is occupied, either by automatic monitoring or by manually checking within 20 minutes prior to any confined space entry or before re-entry after the confined space has been vacant for more than 20 minutes.

  All Isolation & Lockout principles shall meet the requirements of WORKSAFE BC Regulations – sections 9.17 & 9.18.

Ventilation

1. For all *Confined Spaces*, maintaining a safe, respirable atmosphere is the foremost concern, and adequate, continuous ventilation and atmospheric testing are the safeguards required to control potential atmospheric hazards.

2. A continuous, adequate, safe and respirable atmosphere *must* be ensured for all areas of the *Confined Space* potentially occupied whenever feasible.

3. Sources of air for ventilation of a *Confined Space must* be free of contaminants and periodically checked for potential introduction of contamination such as fuel burning systems, gases, vapors, fumes, dust, etc.

4. When the source of air for ventilation of a *Confined Space* is remote from the *Entry* point, (not in line of sight for the *Outside Person*), a sign *must* identify the intake.

5. Contaminated air expelled from a *Confined Space must* not cause potential exposure to others.

8. GENERAL ENTRY PREPARATION GUIDELINES (HAZARD CONTROLS) (cont'd)

Ventilation (cont'd)

6. There are three (3) types of ventilation recognized for *Confined Space entry* application:

   i) Continuous *natural ventilation*,
   ii) Continuous *mechanical ventilation*,
   iii) *Local exhaust ventilation*. (for removal of contaminants ONLY, not suitable for Confined Space Ventilation).

7. In many cases, best results would be achieved by combining two or more of these ventilation techniques.

8. Whenever practicable, the **minimum** amount of fresh air introduced into the *Confined Space* will be equivalent to:

   - 10 complete air changes per hour for a *Confined Space* with a Moderate Atmospheric Hazard rating or

   - 60 CFM (cubic feet per minute) for each and every person entering into a Low Atmospheric Hazard rating *Confined Space*.

9. *Natural ventilation must* be guaranteed to provide a continuous, adequate, safe, respirable atmosphere, while considering the potential conditions inside the *Confined Space*. Guidelines for using *natural ventilation* are as follows:

   i) To be considered adequate, *natural ventilation must* be measured and recorded on the permit as to velocity at least every two hours to ensure minimum requirements are being maintained.
   ii) Measurement results are to be retained and filed by the Gatehouse with the CSE paperwork.

   Natural ventilation **cannot** be used in a High Hazard atmosphere or if such ventilation could draw other than clean respirable air into the confined space.

10. *Mechanical ventilation* is required whenever *natural ventilation* cannot be guaranteed to provide an adequate, safe, respirable atmosphere, while considering the potential conditions inside the *Confined Space*. Guidelines for using *mechanical ventilation* are as follows:

    a. To be considered adequate, *mechanical ventilation must* be continuous and may consist of using equipment such as fans, fans with ducting, or compressed air driven horns, (venturis).
    b. If mechanical ventilation is used, it must be designed, installed and maintained to adequately ventilate all areas within the confined space to properly control airborne contaminants
    c. Fan size, or air moving capacity required for a specific *Confined Space*, *must* be identified on the site specific Entry Permit
    d. Fan size, or air moving capacity required for a specific work activity *must* be identified within the written work procedures.
    e. Flow reduction, (friction loss), due to ducting length, diameter and configuration *must* be considered to meet the required air flow identified on the site specific Entry Permit. Confirmation through the use of a Velometer is required when any doubt of adequate ventilation exists.
    f. Ventilation equipment used for *Confined Space Entry must* be inspected for integrity and rated capacity at least annually. Such inspections *must* be logged and the equipment *must* be tagged with the date of the last inspection.
    g. Generally, ducting air to the lowest region of the *Confined Space* is the best assurance of displacing a potentially *hazardous atmosphere*.
    h. *Mechanical ventilation should* compliment the natural airflow direction.
    i. Potentially flammable atmospheres necessitate the use of explosion proof ventilation equipment, including *grounding* against possible static discharge.
    j. Ventilation equipment *must* be continuously monitored to ensure that it does not get shut off or unknowingly fail.
    k. All power sources including both ends of any extension cords being utilized must be clearly tagged identifying them as critical equipment.
    l. Blowing air into a *Confined Space*, (positive pressure) can produce air flows 30 times as effective as trying to draw air out, (negative pressure).

11. *Local exhaust ventilation* by itself is not to be considered adequate for providing a safe, respirable atmosphere. This type of ventilation is used to remove contaminated air at its source before it has had a chance to spread throughout the *Confined Space*. It is most useful where a point source of contamination is present, such as a waste sump, or when welding is being done. Guidelines for using *local exhaust ventilation* are as follows:

    a. Position the capture hood as close as possible to the contamination source, ideally within one duct diameter.
    b. Keep bends in the exhaust duct to a minimum.
    c. Duct exhaust air outside of the *Confined Space* and away from any air intake.
    d. Ensure that other workers are not exposed to the exhausted air.
    e. Provide adequate fresh make-up air into the *Confined Space* to compensate for air exhausted by the system.
    f. Ensure air flow rates are high enough to remove the contaminants.

12. Whenever work activities or area conditions change, the ventilation requirements *must* be re-assessed to ensure continued effectiveness.

<u>Cleaning and Purging</u>

1. Cleaning and Purging are preparation procedures carried out prior to worker *entry*. Ventilation will be required either during or following these procedures.

2. Cleaning procedures may include steam or water cleaning, neutralization, descaling and special solvent application. Precautions required during these procedures include:

    i) Site specific written work procedures for cleaning of storage tanks and/or vessels.
    ii) Whenever possible, clean the *Confined Space* and remove the waste *without entry*.
    iii) When flammable residues are present, ignition sources *must* be controlled. For example, use only explosion proof equipment and locate ignition sources such as internal combustion engine powered equipment at a safe distance outside the *Confined Space*.
    iv) Provide ventilation as necessary to control *air contaminants*. For example, vapors produced by grinding, fibreglassing, high temperature steam cleaning or gasing-off of disturbed sludge.
    v) Whenever possible, choose solvents which are least toxic, least flammable and least likely to produce hazardous by-products on contact with residues.
    vi) Remove any hazardous cleaning agent and/or residues prior to *entry*.

vii) Keep spontaneously combustible substances such as finely divided carbon or iron sulfide wet until removal is complete.

3. When steam cleaning:

   i) DO NOT use steam on substances with *Auto ignition Temperatures* less than 20 degrees above the steam temperature.
   ii) Provide adequate outlets to relieve pressure during steaming, and to prevent vacuuming afterwards. This will also prevent vacuum collapse while draining liquids.
   iii) When steam cleaning metal tanks in which flammable materials are present, bond the nozzle of the steam hose to the tank and ensure that the system is grounded.
   iv) Following steam cleaning, it is preferable to allow the *Confined Space* to cool completely before *entry*. If *entry* is necessary before the space has cooled, measurements *must* be taken using the *WBGT* method and proper protective measures instituted as per the HSPP 'Heat & Cold Stress Protection Program'.
   v) Dispose of waste water in a safe manner.

4. *Purging* is the displacement of a *hazardous atmosphere* in a *Confined Space* by a fluid such as water or a nonflammable gas, usually nitrogen or carbon dioxide. Precautions required during these procedures include:

   i) Site specific written work procedures for *purging* of storage tanks and/or vessels.
   ii) When *purging* a flammable material, control all sources of ignition, including bonding/*grounding* to prevent static discharge.
   iii) Ensure that the *purge* gas does not contaminate work areas outside of the *Confined Space*.
   iv) Prior to *entry*, displace the *purge* gas with air, NOT OXYGEN, and test the atmosphere.

   NOTE: If a purge gas is maintained in the Confined Space to ensure an inert atmosphere during subsequent work procedures, such as Hot Work, the procedure is called inerting. Entry into an inerted atmosphere is prohibited unless a variance is obtained from the Workers' Compensation Board.

8. GENERAL ENTRY PREPARATION GUIDELINES (HAZARD CONTROLS) (cont'd)

Classification of Confined Spaces

1. All *Confined Space Entries* will be classified in accordance with Worksafe BC Regulations as follows:

   - Low Hazard Atmosphere – Non-Permit required (See Appendix 2)
   - Low Hazard Atmosphere – Permit required
   - Moderate Hazard Atmosphere
   - High Hazard Atmosphere / High Risk Entry

9. DEVELOPING SAFE WORK PROCEDURES

Written Work Procedures

Prior to any entry into a Confined Space, written safe work procedures must be developed for the work to be performed and will be based on the completed CS Hazard Assessment. These specific Confined Space Entry work procedures must have been developed by qualified and knowledgeable people to ensure the safety of all workers when performing tasks. These written procedures along with their associate lockout procedures can be found in the company's intranet pages under each department or area.

Entry Permit

1. Before entry into most confined spaces, a Confined Space Entry Permit must be completed (Refer to Decision tree #2 for determining if Confined Space Entry requires entry via Permit & Hatch watch or via Safe Work Procedure)

2. The CS entry permit may be completed and signed by the Hatch Watch but must be reviewed, verified and signed by the Area or Entry Supervisor prior to any worker entering into the space.

3. A copy of the CS entry permit will be attached to each individual Confined Space written safe work procedure. If it is not available, the CS entry permit can be obtained from the HSPP intranet under "forms" and then "safety".

9. DEVELOPING SAFE WORK PROCEDURES (cont'd)

Entry Permit (cont'd)

4. The CS entry permit must be available at the entrance to the confined space at all times.

5. The CS entry permit is only valid for the work activities specified in it and the date and shift/time shown.

6. A NEW confined space entry permit must be issued if there is a significant change in the scope of work being done in the confined space, or a wholesale change in work crew occurs.

7. The existing Permit must be re-authorized whenever the responsible Supervisor changes and must be signed by the new responsible Supervisor.

8. Upon completion of the shift, the original confined space entry permit documents, (the permit, gas testing results sheets, entry log sheets, and pre-meet checklist) must be returned to the gatehouse.

9. Copies of the written safe work procedures, hazard assessments, and lockout procedures/forms must be sent to the gatehouse at the completion of the job. These documents will be filed with the related Permit documents and maintained for a minimum of one year [Section 9.16 of the WORKSAFE BC OHS Regulation].

Entry Preparation

Before entry is made into any confined space, the Area or Entry Supervisor must ensure the following are adhered to:

- Ensure workers, involved in the confined entry process, are educated and trained in accordance to the "Education and Training" section of this Confined Space Entry Program;
- Conduct a 'Pre-Entry Meeting' between the *Outside Person*, those entering the *Confined Space* and the Supervisor responsible for those entering the *Confined Space*. The pre-meet should also include the Fire Rescue team members if they are required for high risk entry. This meeting would include a review of the Hazard Assessment, the site specific CS entry permit as well as written safe work procedures for the work to be performed inside the *Confined Space*. Confirm that appropriate safety measures/controls have been implemented and effective. This pre-meet must be documented on the Pre-Meet Checklist form.
- Ensure entry preparations have been completed to control and eliminate hazards;

9. DEVELOPING SAFE WORK PROCEDURES (cont'd)

Entry Permit (cont'd)

- Review and verify all contents of the CS entry permit or safe work procedure before signing and permitting worker entry. For example, the Area or Entry Supervisor should confirm that:

  - all confined space entry members are trained, authorized for their tasks, and that they understand their tasks,
  - all necessary safeguards or controls, personal protective equipment, and rescue equipment are operable and ready,
  - the Gatehouse has been notified before and upon completion of confined space entry to ensure quick and efficient summoning of the rescue team, if required.
  - all workers understand the signal for evacuation.

- Ensure all workers are educated and trained in the proper use of their personal protective equipment (i.e., respiratory protection devices, fall protection, etc.), radio communication equipment, ventilation systems, and gas detection/monitoring equipment;
- Issue all workers the appropriate personal protective equipment and other tools they are responsible for;
- Ensure the Hatch Watch (Outside Person) or entrant who is conducting the air/gas testing and monitoring is trained and knowledgeable in performing the sampling;

Entry Locations (Access Points)

Persons may only enter confined spaces when all safety measures or hazard controls and documentation have been completed to protect the safety of all workers involved. Entry may only be made at the designated point and under the control of the Hatch Watch (Outside Person). All other points of possible entry must be taped off with red "Do Not Enter" tape and have posted "DO NOT ENTER, CONFINED SPACE" signs.

Exit from the confined space shall be at the same point/location as entry unless it is unsafe or impractical. If a person exits the confined space from a different point than that designated, he or she **must** advise the Hatch Watch, (if being utilized), stationed at the entry point of where and why exit was made at a different location. The Hatch Watch (Outside Person) will note this in the permit so further consideration can be made in future entries.

10. ATMOSPHERIC TESTING/MONITORING

A hazardous atmosphere can arise from one or more of the following causes:

- flammable gas, vapors, or mist in excess of 10% of the lower explosive limit (LEL),
- airborne combustible dust at a concentration that exceeds the LEL,
- oxygen concentration less than 19.5% or greater than 23%,
- concentration of any toxic substance exceeding the WORKSAFE BC exposure limit **(Table of Exposure Limits for Chemical and Biological Substances)**
- any other atmospheric condition recognized as Immediately Dangerous to Life or Health (IDLH).

The most deadly of all hazards are the ones that are undetected or “invisible” hazards such as accumulation of “toxic” gases (i.e., H_2S, SO_2, CO, etc.) especially substances that do not have warning properties, accumulation of “combustible” gases (e.g., gasoline, propane, turpentine), or the absence of enough oxygen (i.e., levels fall below 19.5%).

Continuous testing/monitoring is to be carried out wherever practicable. (Since the maximum battery life of the gas monitors is at least 8-hours, continuous testing/monitoring is advised but record data/information in the permit at a minimum of 2 hour intervals)

10. ATMOSPHERIC TESTING/MONITORING (cont'd)

Frequency of Testing

Regular intervals of testing and monitoring should be conducted to guarantee hazardous atmospheric conditions are identified and controls are implemented promptly. Testing guidelines and frequencies are provided below:

- Air testing must be conducted by a trained and qualified person (i.e., trained entrant, Hatch Watch or Outside Person),
- Bump test and/or span calibration (via gatehouse personnel only) and zero calibration must be completed prior to equipment usage,
- The confined space atmosphere must be tested for the existence of harmful atmosphere before any worker enters the space,
- Testing should not be conducted more than 20 minutes before a worker enters the confined space
- Testing must be repeated before re-entry if the space has been vacant for more than 20 minutes.
- Re-test the atmosphere if ventilation and/or cleaning were completed because of unsafe conditions.
- If the space is continually occupied, continuous testing or monitoring of the atmosphere must be conducted if a flammable or explosive atmosphere in excess of 10% of the lower explosive limit (LEL) could develop.

NOTE: as testing/monitoring equipment must be span tested regularly (in accordance with the manufacturer's protocols), bump-tested at least every 24-hours (during continuous usage or operation) or prior to usage, and zero calibrated (fresh air calibration) before usage.

Span and Bump tests must be completed by trained and authorized personnel only. This is currently limited to gatehouse attendants

NOTE: In the case where a HSPP Confined Space is to be turned over to Contractors for work, an **Initial Gas Test** must be completed by a trained HSPP representative and the results must be recorded on the Initial Gas Test Form (Appendix 3). A copy of the results must be posted at the Lockout Board associated with the Confined Space.

11. RESCUE

Alarm/Rescue Procedures

1. In the event of an emergency, such as obvious distress or injury during a 'Standard' *Confined Space Entry*, or when the worker(s) in the *Confined Space* do not respond appropriately, the *Outside Person* will instruct all other personnel to evacuate the *Confined Space*, and;

   i) Summon the aid of the Fire/Rescue Crew through contact with the Gatehouse by telephone (local 2222) or directly by radio provided specifically for this purpose.

   ii) Upon receiving the information that a *Confined Space* rescue is required, the Gatehouse Attendant will immediately activate the Fire Siren and page the Fire/Rescue Crew members. The Attendant will inform the Fire/Rescue Crew that a *Confined Space* rescue is required to ensure an appropriate equipment response. In addition, the gatehouse will order the evacuation of all other Confined Space Entries in progress.

NOTE: Most Confined Space tragedies have been a result of a harmful atmosphere and the **majority of fatalities are would be rescuers.**

   iii) After notification of the Gatehouse, the *Outside Person* will attempt to remove the victim(s) from the OUTSIDE of the Confined Space, using the lifeline (if utilized in the *entry*.

   iv) Assist the Fire / Rescue team members as directed from the Outside of the Confined Space

2. In the event that a vertical entry is made via standard ladder or access platform, the pre-entry rescue plan will identify what rescue equipment and procedures are required to facilitate rescue. This identified equipment must be stationed at the entrance or be readily accessable by the Fire/Rescue team upon their arrival.

11. RESCUE (cont'd)

High Hazard Atmosphere /High Risk Confined Space Entry

For high hazard confined space entry as defined by access/egress restrictions, and where hazardous atmosphere may pre-exist and/or hazardous atmosphere may develop, workers inside the confined space must wear:

- a harness of a type which will keep the worker in a position to permit rescue and
- a life-line attached to the harness, which is tended at all times by the Hatch Watch (Outside Person(s)) stationed outside the entrance to the space and is equipped with suitable lifting equipment as identified in the pre-entry rescue plan.

NOTE: The use of a lifeline is not required if the risk assessment identifies obstructions or other conditions that make its use impractical or unsafe.

NOTE: A waist harness or safety belt is not acceptable.

If rescue cannot be effected by the hatch watch person(s) using harnesses, lifelines and lifting equipment, then one or more additional workers must be stationed at the entrance to the confined space and these workers must be equipped and capable of entering the space and effecting rescue.

Where flammables are involved, fire suppression equipment will be kept near the site and available for immediate use. Where corrosive chemicals are involved, emergency washing stations (eyewash and shower) must be located within 5 second walking distance or located less than 6 meters (20 feet) away.

12. RECORD KEEPING/DOCUMENTATION

Because individual positions and responsibilities change with changing confined spaces and their nature of entry, records ensure continuity from the past to the future and ensure that adequate education and training are provided where necessary. Records also provide vital information and a link between activities involving confined spaces in accident prevention. Record keeping establishes the credibility of the Confined Space Entry Program by proving performance, competence, and compliance.

Table 4: Documents to be Maintained

DOCUMENT TYPES	WORKSAFE BC OHS REG.	MIN. DURATION	UPDATE	DEPARTMENT
(1) Training or record of qualification (e.g., electrical qualification, first aid certificate, fall protection, gas monitoring, etc.)			Annual or as specified by Trainer	Training Department
(2) Equipment/instrumentation performance, maintenance, and calibration.			As per manufacturer (daily, weekly, monthly, prior to usage)	Gatehouse or responsible person and documented in "service log books"
(3) Written work procedures.			Annual or as required	Area Qualified Person
(4) Hazard Assessments and Pre-Job Hazard Identification & Risk Assessment.			Prior to project commencement	Area Qualified Person
(5) Entry documents (i.e., Permits)	Sec. 9.16	1 year min.	Annual review or as required	Gatehouse
(6) Air Monitoring Results		1 year min.	Annual review or as required	Gatehouse
(7) Inspection & maintenance of safety equipment (i.e., harnesses, fall arrest, retrieval equipment, etc.)			As per manufacturer (daily, weekly, monthly, prior to usage)	Tool crib or responsible person and documented in "service log books"
(8) List or inventory of confined spaces at the mill			Annual review or as required	Area Qualified Person

13.0 REVISION HISTORY

Rev. 01: Re-write of program after Confined Space Audit completed.
Rev. 02: Insert - New Howe Sound Pulp & Paper Corporation Logo
Rev. 03 Addition to Section 8. Isolation of Nuclear Devices to reflect changes to HSPP E/I isolation procedures related to the Canadian Nuclear Safety Commission Regulations
Rev: 04 Additions/Revisions to Sections 4 & 9 of Program document after CS Audit of program completed by JOHSC.

AUTHORIZED BY:

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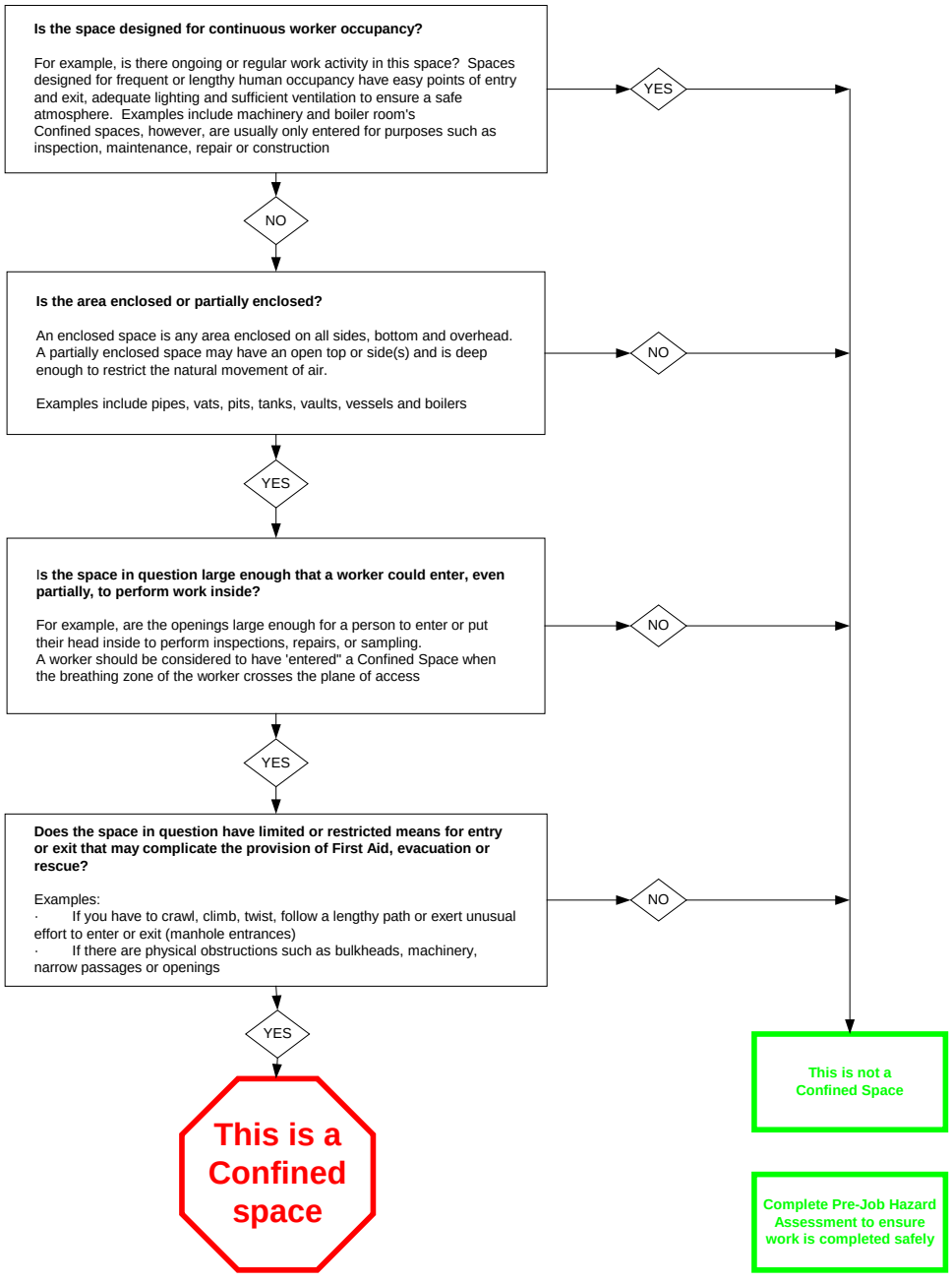
Don Rheaume, President CEP Local 1119

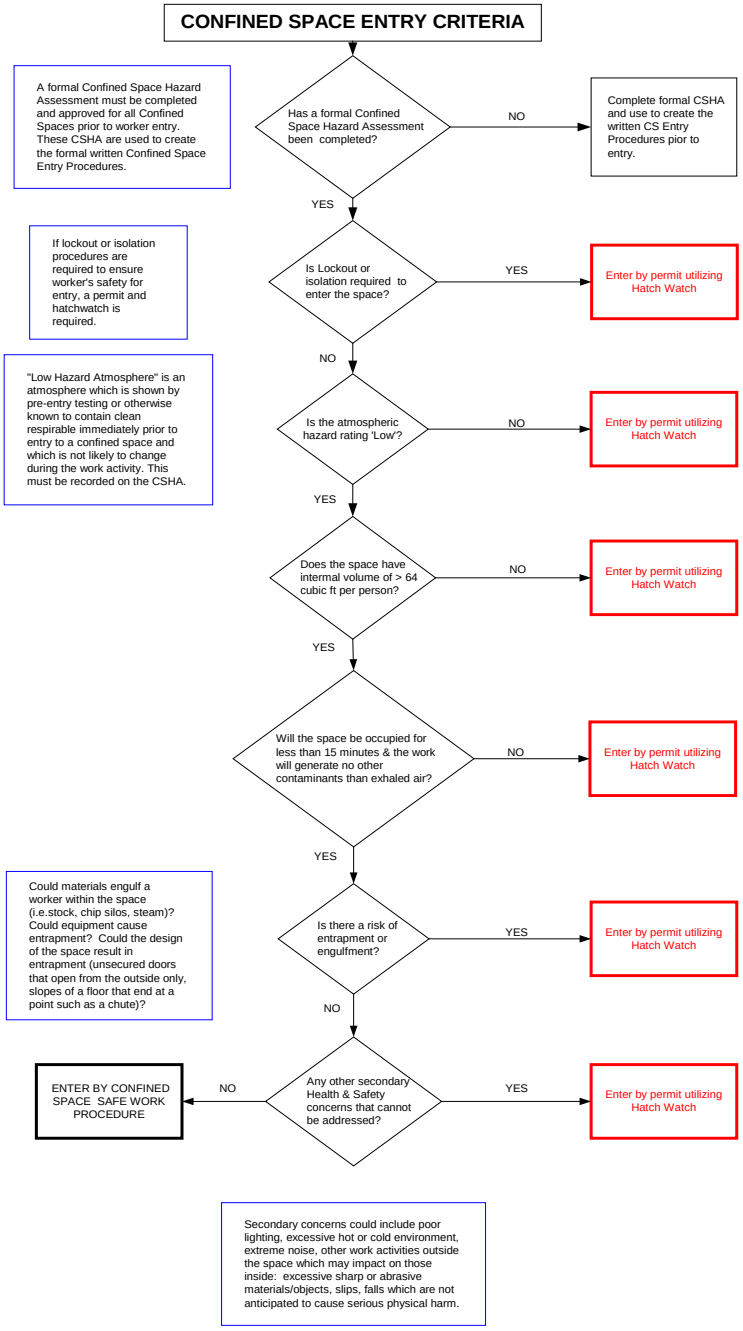
Appendix 1

Confined Space Decision Tree



Appendix 2

JOINT SAFETY MANAGEMENT SYSTEM
CONFINED SPACE PROGRAM



Appendix 3 must be current

Initial Gas Test Form

HOWE SOUND
PULP & PAPER CORPORATION
A PAPER EXCELLENCE COMPANY

CONFINED SPACE ENTRY PERMIT

CSE Lockout Procedure # and Title

ATMOSPHERIC TESTING OF HAZARDOUS GASES (Enter Air Test Values Every 2 Hours as a Minimum)

Hatchwatch Name: _____
Date: _____

Gas Tester Name/Time	Oxygen (O_2)	Combustible Gas (LEL)	Hydrogen Sulfide (H_2S)	Carbon Monoxide (CO)	Sulfur Dioxide (SO_2)	Natural Ventilation (Cfm)	Block & Bleed Points Checked	Other Gases	Other Gases

FIRE and/or FIRST AID EMERGENCY PHONE: 2222
Only to be used for ONE (1) shift only, not for consecutive shifts.

Date Effective: May 23, 2013