

Confined Space Entry

BP WIND ENERGY POLICIES AND PROCEDURES

CONFINED SPACE ENTRY [Document Control Details](#)

Confined Space Entry

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Confined Space Entry

1.0 Purpose

- 1.1 The purpose of this procedure is to establish the minimum requirements for personnel to follow when conducting confined space entry work. This procedure addresses the requirements that must be implemented under routine confined space entry and/or potential situations where confined spaces may meet the OSHA requirement for entry as a permit-required confined space.
- 1.2 This procedure addresses permit-required, alternative entry and non-permit-required confined space entries and is intended to:
 - Prevent unauthorized and unintentional personnel entry into a confined space, and
 - Confirm safe entry into, and work within confined spaces by authorized personnel and emergency rescue services.

2.0 Reference

- 2.1 29 CFR 1910.146 "Permit-Required Confined Spaces" Occupational Safety and Health Administration,
- 2.2 BP Wind "Energy Isolation – Lockout/Tagout"
- 2.3 BP's "Golden Rules of Safety"
- 2.4 BP Group Standard 02 – "Control of Work"
- 2.5 AWEA – Confined Space Classification

3.0 Scope

- 3.1 This procedure is applicable to all BP Wind Energy employees and contractors who enter confined spaces, prepare confined spaces for entry, or provide emergency rescue services in confined spaces at all BP Wind Energy locations.
- 3.2 This procedure does not apply to "Non-Operational" Construction sites. These sites will utilize the confined space procedures of the General Contractor as long as those procedures meet or exceed the requirements outlined in this procedure.
- 3.3 Examples of confined spaces at BP Wind Energy locations include but are not limited to:
 1. Wind turbine blades,
 2. Rotor hub,
 3. Tower sump/cellar

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4.0 Responsibilities

Designated permit accountabilities are authorized by the Site Manager and shall be documented at the facility to assure proper authorization is assigned for the BP Wind Energy Confined Space Entry process. The names of the individuals participating in the confined space process must have documented proof of approved confined space training prior to beginning any authorized Confined Space Entry work.

4.1 Area Authority (AA) – Generally the Site Manager or his/her designee

The Area Authority has responsibility to ensure expectations for this procedure are both communicated and met within the scope of his/her respective site.

Responsibilities include:

- Overall operation and responsibility of the sites Confined Space Entry procedure,
- Signature approval of deviations from PTW procedures,
- Authorize the Permit System authorities as competent to carry out their duties as described in Confined Space Entry procedure;
- Assure training of personnel to achieve full compliance with this procedure;
- Ensuring that regular monitoring and auditing of this procedure and acting upon the results of audits to maintain the integrity of the system and to propose recommendations for improvement,
- Capture, incorporate and share internal and external lessons learned that impact the Confined Space Entry procedure.

4.2 Issuing Authority (IA)

The Issuing Authority is an individual designated by the Area Authority and trained and qualified as a competent authority to issue Confined Space Entry Permits in their respective area of work authority.

Responsibilities include:

- Assuring that Work Plan complies with the requirements of the Confined Space Entry procedure;
- Monitoring work covered by this procedure to verify adherence to requirements and take effective action to correct non-compliance;
- Complete close-out and recordkeeping of Confined Space Entry Permit;
- Documentation of training/certification of Authorized Gas Tester and Standby Attendant.
- Ensure Rescue Plan is properly completed and Rescue Personnel are available and understand the Work Plan for Confined Space Entry work.

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4.3 Performing Authority (PA)

Responsibilities include:

- Obtain a Confined Space Entry Permit when conducting any work which meets the definition specified in Section 5.0;
- Post the Confined Space Entry Permit in the immediate area of the activity;
- Complete assigned work and follow all requirements listed on the Confined Space Entry permit;
- Upon completion of Confined Space Entry activity, close the Confined Space Entry Permit and return the form to the Issuing Authority.

4.4 Entry Supervisor

Responsibilities include:

- Determine if acceptable entry conditions are present at a confined space where entry is planned;
- Complete and discuss the JSEA with all personnel involved in the Confined Space Entry;
- Authorize entry and oversee entry operations;
- Know the hazards that may be faced during entry, including information on how exposure might occur, signs or symptoms of exposure, and consequences of exposure;
- Provide required instructions to the Standby Attendant;
- Verify that all tests specified by the permit have been conducted and that all procedures /policies and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin;
- Verify that all persons involved in confined entry are properly trained in their assigned duties.
- Verify that rescue services are available and that the means for summoning them are operable;
- Remove unauthorized individuals who enter or who attempt to enter the confined space during entry operations;
- Whenever responsibility for a confined space entry operation is transferred, and at intervals dictated by the hazards and operations performed within the space, determine that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained;
- Terminate the entry and cancel the permit when the entry operations specified by the permit have been completed or when a condition not allowed under the entry permit arises in or near the confined space, and
- Be responsible for the Issuance and closure of Confined Space Entry Permits.

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4.5 Authorized Gas Tester

Responsibilities include:

- The equipment used is suitable for the atmosphere to be tested, properly calibrated and maintained according to manufacturer's procedures, and within its validation period.
- They are sufficiently knowledgeable to interpret the results correctly.
- They are aware of the likely contaminants and the testing requirements of this procedure.

4.6 Standby Attendant

The Stand-by Attendant must know the hazards of the confined spaces and be able to recognize behavioral effects of potential exposures. The Attendant cannot perform other duties that interfere with their primary duty to monitor and protect the safety of Authorized Entrants. The Attendant must be equipped with an air horn, radio or some other means of communication to summon help in the event of an emergency. The communication device shall be used only in an emergency.

Responsibilities include:

- Maintain a continuous count and identification of authorized entrants at all times;
- Remain outside the space until relieved by another trained Attendant and should maintain communications with entrants;
- Must monitor activities both inside and outside the confined space and order an exit if conditions become hazardous;
- Summon the rescue team, if needed;
- Prevent unauthorized entry into the confined space. If an unauthorized person enters the confined space, the Attendant must advise them to exit immediately and inform the Entrants, the Supervisor, and the Designated Issuing Authority of the unauthorized Entrant;
- May perform "non-entry" rescues as specified in the rescue plan.

4.7 Rescue Personnel

Rescue personnel are responsible for all interior rescue operations in a confined space.

Responsibilities include:

- Know the hazards that they may face during the entry, including information on the mode, signs or symptoms and consequences of exposure to chemicals possibly present.
- Know how to use and properly utilize the appropriate rescue personal protective equipment.
- Maintaining effective and continuous contact with outside personnel;
- Complying with provisions of the entry permit;
- Evacuating the confined space when they perceive a hazard or are notified by the attendant;

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- Practicing and documenting confined space rescue training annually;
- Current certification in first-aid and CPR; and
- Ensuring that a Material Safety Data Sheet (MSDS) is provided to medical facilities treating rescued entrants who were exposed to a chemical substance.

5.0 Definitions

- 5.1 **Acceptable entry conditions** – The conditions that must exist in a confined space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.
- 5.2 **Authorized Gas Tester** - A competent person authorized in writing by an employer to carry out atmosphere tests for Confined Space Entry Authorization and Permit purposes. Such a person will have received training in the use of the gas measuring instruments.
- 5.3 **Authorized Entrant** – An employee who is authorized by the employer to enter a confined space.
- 5.4 **Competent Person** – A person who is capable of identifying existing and predictable hazards in the working conditions or surroundings which could be unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
- 5.5 **Confined Space** – A space that:
- Is large enough and configured so that person can enter and perform assigned work, and;
 - Has limited or restricted means for entry or exit, and;
 - Is a space not designed for continuous employee occupancy.
- 5.6 **Confined Space Entry Permit** - Work Permit used to control the entry of persons into confined spaces. This permit will not cover any work activities to be conducted inside the confined space, except visual inspection.
- 5.7 **Entry Supervisor** – The 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.
- An Entry Supervisor (*Issuing Authority (IA)*) also may serve as the Standby Attendant or as an Authorized Entrant, as long as that person is trained and equipped as required by this program for each role he or she fills. An Entry Supervisor cannot simultaneously serve in both the Entry Supervisor and Authorized Entrants roles. Also, the duties of the Entry Supervisor may be passed from one individual to another during the course of an entry operation. The Entry Supervisor may be any properly trained personnel.
- Entry Supervisors shall certify in writing that all hazards in the permitted space have been eliminated and make this document available to each entrant. This certification shall contain the date, location of the space, and the signature of the Entry Supervisor.
- 5.8 **Explosive (Flammable) Range** – The range of flammable gas, mist or vapor in the air mixture between the Lower Explosive Limit (LEL) and the Upper Explosive Limit (UEL).
- 5.9 **Forced Ventilation** – The use of mechanical devices, such as fans or air movers to produce a safe atmosphere within a confined space.

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- 5.10 **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 confined space), injury, or acute illness from one or more of the following causes:
- Flammable gas, vapor, or mist in excess of 1.0 percent of its LEL;
 - Airborne combustible dust at a concentration that meets or exceeds its LFL; NOTE: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet or less.
 - Atmospheric oxygen concentration below 20.8 percent or above 22.5 percent;
 - Atmospheric concentration of any substance which could result in employee exposure in excess of its occupational exposure limit (OEL) or permissible exposure limit (PEL);
 - Any other atmospheric condition that is immediately dangerous to life or health.
- 5.11 **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 confined space.
- 5.12 **Inert Space** – Space with an atmosphere insufficient to support life (immediately dangerous to life and health).
- 5.13 **Isolation** - The process by which plant and equipment is removed from service and completely protected against the release of energy and material by such means as: lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages. While not usually applicable in the Wind Industry, Isolation also includes blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; and/or a double block and bleed system.
- 5.14 **Job Safety Environmental Analysis (JSEA)** – A JSEA is a communication and planning tool to analyze a job in a methodical manner by defining the key tasks of the job in order to anticipate hazards and recommend elimination or mitigation of the hazard(s). The JSEA shall be discussed with all personnel involved before Confined Space Entry work begins.
- 5.15 **LEL (Lower Explosive Limit)** - The minimum concentration of gas, mist or vapor in the air below which the substance will not burn or explode. Below this concentration, the mixture is too "lean" to ignite or explode. The term "Lower Flammable Limit" or "LFL" is sometimes used to describe the same effect.
- 5.16 **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.
- 5.17 **Oxygen Deficient Atmosphere** - An atmosphere containing less than 20.8 percent oxygen by volume. (The atmosphere we breathe is 20.8%). Entries into known oxygen deficient atmospheres will normally be performed by contractors with specific expertise for working in such conditions.
- 5.18 **Permit Required Confined Space** - An OSHA "confined space" is defined above. By OSHA definition, a "permit-required confined space" must meet the confined space requirements, and also have one or more of the following characteristics:
- Contains or has a potential to contain a hazardous atmosphere,
 - Contains a material that has the potential for engulfing an entrant,
 - Has an internal configuration that could trap or asphyxiate an entrant by inwardly

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converging walls or a floor that slopes downward and tapers to a small cross section, or

- Contains any other recognized serious safety or health hazard.

5.19 **Rescue** - Moving an incapacitated person from a location inside the confined space to a safe location outside the confined space.

- **Entry Rescue** – The confined space *rescue team* is standing by at the entry site ready to execute the emergency response plan for *internal rescue*. Stand-by rescue is mandatory for safe entry if the entrant would have difficulty exiting the space unassisted, if the entry is non-routine, if supplied breathing air is required for the entry, or if the potential confined space hazard is *IDLH*.
- **Non-Entry Rescue** - The rescuers do not physically enter the confined space; the entrant is extracted by *attendants* via his life-line and with retrieval equipment located outside the space (e.g. a lifting device).
- **Self-Rescue** - The entrant removes himself from the confined space.

5.20 **Rescue Team** - Rescue professionals or a designated team of employees who have current qualifications in standard first aid, CPR, the use of SCBAs, and are trained and equipped to perform external and internal confined space rescue work.

5.21 **Retrieval Line** - A 1/2 inch polypropylene line or equivalent secured at one end to the worker by a harness and is secured at the other end to a retrieval device or anchor.

5.22 **Retrieval System** - The equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from confined spaces

5.23 **Standby Attendant** - A person stationed outside the confined space who is trained to monitor work being carried out inside the space, and who performs all Standby Attendant duties outlined in this procedure (see Attachment 2). The Standby Attendant's primary function is to raise the alarm should an incident occur inside the Confined Space. The "Standby Attendant" will not attempt to launch a rescue without proper support from emergency services personnel.

5.24 **UEL (Upper Explosive Limit)** - The maximum concentration of gas, mist or vapor above which the substance will not burn or explode. Above this concentration, the mixture is too "rich" to ignite or explode.

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6.0 Procedure

6.1 Confined Space Classification at BP Wind Energy Sites

A. Tower Sumps and Cellars

The sump or cellar area of the tower is the recessed area, typically below the tower access door level of the tower. This section of the tower is characterized by a single access ladder that extends down from the access level. The sump or cellar is usually the entry point for the cabling that connects the wind turbine generator to the pad mounted transformer. In many cases, this area receives ambient lighting from the tower level above and is not configured with the fresh air vents found at the entrance level.

Because the sump area meets the three criteria for a confined space, it should be classified as such. *However*, this area generally would not be anticipated to have oxygen deficiency, hazardous atmosphere or any configuration or contents that would dictate classification as a 'Permit Required Confined Space'.

B. Wind Turbine Towers

The towers of a typical wind turbine consist of several levels or sections. The tower will have, at a minimum, a ladder to access the nacelle from ground level and may also have a service lift, depending on the manufacturer and specification of the owner/operator.

The tower serves as the conduit for the electrical and fiber optic cables that connect the turbine in the nacelle with the equipment located at the base tower level. The tower is equipped with man-made lighting and natural ventilation through installation of ventilation grills/grates at the base tower level and up-tower provide a natural chimney effect for ventilation of the tower. This natural ventilation is typically enhanced by leaving the main tower entrance door open.

When evaluating the tower, the space does not have all three characteristics of a confined space. Specifically, the space does not meet the definition of not being designed for continuous occupancy since the design includes both housing and a conduit for electrical and control cables as well as being designed for human occupancy on a recurrent or regular basis. Therefore, as a general rule, the tower is not a confined space.

C. Nacelle

The nacelle houses the turbine generator and other mechanical and electrical components necessary for the operation of the turbine. Strict environmental parameters on maximum allowable wind speeds for nacelle entry restrict access to the nacelle whenever wind speeds could result in hazardous sway or result in possible over-speed conditions involving the rotor system. Upon gaining entry to the nacelle, the rotor system is locked into a static position to prevent it from rotating.

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The nacelle has a dual design which is designed both to house the turbine and to provide a safe work area for technicians to maintain the turbine and related control systems. So, while the space has two of the three characteristics of a confined space it is designed for continuous human occupancy. Therefore, the 'typical' nacelle is not a confined space.

D. Rotor Hub

The design of rotor hubs varies greatly between manufacturers and designs. The rotor hub is the connection point of the blades and rotates as the blades are impacted by the prevailing wind. The interior of the hub also typically contains electrical or hydraulic control system components. In some designs there are multiple routes of access between the rotor hub and the nacelle while in others the sole route of access is through an access hatch that can only be reached by traversing the top of the nacelle and entering the hub from the top.

The rotor hub is typically a restricted space that is not equipped with walking or working surfaces. Typically there is excellent natural ventilation inside the hub and the configuration is such that entanglement or entrapment is unlikely provided that the rotor hub has been locked to prevent movement.

Because the design of the hub typically does not include provisions that would meet the "continuous human occupancy" standard, the typical rotor hub would be classified as a 'Non Permitted Confined Space'.

E. Blades

The single point of entry into each blade is through the blade root, through an access hatch. The blade clearly has all three of the characteristics of a confined space. Additionally, the interior configuration of the blade does have inwardly converging walls that could result in entrapment, especially if an entrant were to enter a blade that was at an angle greater than 90° or less than 270°.

Therefore the determination or classification of the space inside a blade is consistent with that of a "Permit Required Confined Space".

6.2 Safety Precautions

- A. Barricades – Whenever making an entry into a confined space, the area around the entrance must be barricaded to prevent unauthorized personnel and/or equipment in the entry area. This barricading can be accomplished by the use of traffic cones, barricade tape or other means.
- B. Time considerations – The working duration should be considered due to the nature of the work. Working periods should be interrupted by rest periods during which the worker is able to leave the confined space area to open air.
- C. Sign In/Out – Entrants must sign in and out of the permit required space on a log sheet maintained by the Attendant.
- D. Fire Protection – A charged fire extinguisher must be present outside the confined space where potential fire hazards exist.
- E. Tools
 - 1. All hand and power tools must be clean and in good condition,
 - 2. Electrical power tools must be grounded or double insulated and extension

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- cords and light cords must be in good condition and properly grounded,
3. Ground Fault Circuit Interrupters (GFCI's) will be used on all portable electric tools used in confined spaces and the GFCI must remain outside of the confined space,
 4. If there is a potential for flammable or combustible atmosphere, then the electrical tools that are brought into the confined space must be intrinsically safe or explosion proof,
 5. Portable ladders must be secured at the top and at the bottom if possible,
 6. If the rescue plan calls for "non-entry rescue," the entrants lifeline must be secured to a fixed point outside the confined space so that it may be used to locate and rescue the entrant if necessary,

6.3 Ventilation

- A. Blowers and/or fans may be used, if needed, to provide fresh air from a location safe from contamination, the need for ventilation must be evaluated as part of the entry planning.
- B. Ventilation can be used as a precautionary measure to prevent the accumulation of hazardous atmospheres, for the comfort of the Entrants or to control the atmosphere within acceptable limits.
- C. Can be used when ventilation is utilized to control an atmospheric hazard and maintain the atmosphere within acceptable limits.
- D. If mechanical ventilation is used, configuration shall be made such that the equipment does not block access routes to the confined space.
- E. If air is pushed into the confined space **to control temperature only**, it must be drawn from an area that does not present a hazard to the occupants of the entry.
- F. Consideration of loss of ventilation due to external power failures must be accounted for in the entry planning as a potential hazard.

6.4 Job Safety Environmental Analysis (JSEA)

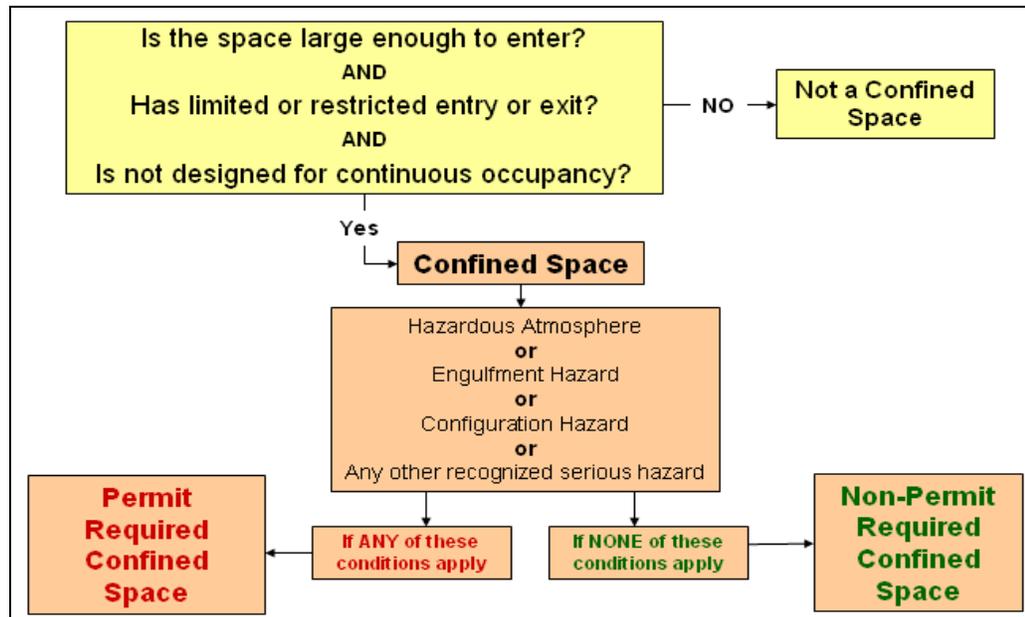
- A. A JSEA must be completed prior to obtaining a Confined Space Entry Permit. In addition, a Risk Assessment shall be performed and/or reviewed that addresses SIMOPS and specifics of all ongoing Confined Space Entry activity hazards/risk. As a minimum, specific items addressed during Risk Assessments must be documented and shall include:
 - Control of environmental conditions
 - Respiratory requirements
 - Entry precautions
 - Any hot work occurring in confined space
 - Isolation requirements
 - Gas testing and standby attendant requirements
 - Rescue plan and rescue personnel
 - The work to be carried out, the number of workers, tools and equipment, and PPE requirements.

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6.5 Permit Requirements

- A. Work in a confined space shall not be allowed until a Confined Space Entry Permit is completed and a Job Safety Environmental Analysis (JSEA) has been conducted. Permits shall have an expiration time and shall not be valid for shifts other than the one in which the work was started.
- B. The completed permit shall be placed in a transparent envelope, a large Ziploc bag, or other protective holder at or near the entrance of the confined space for the duration of the work.
- C. Each site shall retain all completed and canceled entry permits for at least one year to facilitate review of the permit-required confined space entry program. Reviews shall be retained for one year from the date of the review.
- D. NOTE: Confined space entry is the actual process of entry; it does not include cleaning, the use of tools, inspection and test equipment, welding and cutting operations, or **anything else except visual inspection. Specific work procedures (and permits) are required that** address these other activities, in addition to the Confined Space Entry procedure.

Figure 6.5 Confined Space Entry Permit Decision Diagram



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6.6 Permit Process

- A. Request Permit – Performing Authority (PA) and/or Issuing Authority (IA)
- B. Initial Review / Verification – Entry Supervisor and/or Issuing Authority (IA)
- C. Permit Issue – Issuing Authority (IA)
- D. Authorize – Area Authority (AA) and Entry Supervisor
- E. Permit goes live (Work Execution) – Performing Authority (PA)
- F. Job Complete – Performing Authority (PA)
- G. Permit to Work Complete – Issuing Authority (IA)
- H. Work Complete and CSE Permit Closed – Area Authority (AA) or Entry Supervisor

6.7 Preparation for a Confined Space Entry

- A. All energy sources shall be locked and tagged out to ensure complete isolation of the confined space. Established electrical lockout/tagout and blinding procedures for equipment isolation shall be followed.
- B. The use of purging and mechanical ventilation shall be considered before entering confined spaces unless conditions prevent its use.
- C. To confirm safe entry conditions, the location shall provide, maintain, and properly use the following equipment as required:
 - Direct reading gas testing equipment for (a) oxygen content, (b) flammable gases and vapors, and (c) potential toxic contaminants.
 - Any necessary ventilating equipment.
 - Communications equipment, as required.
 - Any required personal protective equipment.
 - Sufficient lighting equipment that is designed for confined space entry to allow for both, safe work and quick exits.
 - Barriers and shields necessary to protect workers from external hazards.
 - Any needed entry or exit equipment, such as ladders.
 - Adequate rescue and emergency equipment to aid in a rescue and offer immediate First Aid and Cardiopulmonary Resuscitation (CPR).
 - Any other equipment necessary for a safe confined space entry and in the event that a rescue is required.

6.8 Testing Confined Space Atmosphere

- A. Before entry, the internal atmosphere shall be tested with a calibrated direct-reading instrument at the working level for the following conditions, in the following order:
 - 1. Oxygen content,
 - 2. Flammable gases or vapors,
 - 3. Toxic vapors and gases, and
- B. In such instances where entry is required to test the atmosphere, the individual conducting the test shall assume that the atmosphere is hazardous and must utilize all applicable PPE.

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- C. All equipment used for atmospheric testing shall be calibrated and operationally checked before use according to the manufacturer's specifications. **NOTE:** the atmospheric tests and operational checks that precede the issuing of a permit shall be done as close as practical to the time the work is to begin and recorded on the entry permit. The following lists actionable levels for these tests:
- The percentage of oxygen for unprotected entry into a confined space shall be no less than 19.5 percent and no greater than 23.5 percent. The oxygen level shall be monitored before the flammability test is conducted.
 - Entry shall not be allowed if the LEL is greater than 10 percent.
 - Entry shall not be allowed if measurements of toxic materials exceed the OSHA Permissible Exposure Limit (PEL).
 - **Direct reading instruments** are the only units approved for confined space entry jobs.
- D. Those confined spaces that do not require respiratory protection based on the test results shall be continuously monitored with an oxygen meter during the performance of work. The area shall be evacuated immediately if the oxygen content falls below 19.5 percent by volume if proper respiratory equipment is not being used. The area shall also be evacuated immediately if the oxygen content rises above 23.5 percent by volume.
- E. Continuous monitoring shall also be conducted for toxic gases and combustible gases LEL that may be released during the course of work. Continuous monitoring for toxic and combustible gases is **mandatory** for all confined space work, regardless of the respiratory protection provided. The area shall be evacuated if the combustible gases rise above 10 percent LEL. The area shall be ventilated to confirm that the LEL is at or below 10 percent before re-entry is permitted.

6.9 Burning and Welding in Confined Spaces

- A. Burning and welding in confined spaces entails unusual hazards and a detailed analysis shall be made of each specific case to insure safe performance of the work.
- B. When burning, welding or heating operations are required in a confined space, either a mechanical method of ventilation, such as a blower, or local exhaust ventilation method, such as exhaust hood must be provided to ensure adequate ventilation. When sufficient ventilation cannot be obtained without blocking the means of access to the confined space, employees in the confined space shall be protected by air supplied respiratory equipment.
- C. When burning or welding is required in any confined space, the gas cylinders and welding machines shall be located outside of the space. Hose connections shall be checked for leakage prior to entry into confined space. Hoses shall be removed from the confined space at the end of work, during lunch periods, breaks, or whenever all personnel leave the confined space.

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- D. All surfaces coated with toxic preservatives or any residual materials from previous use must be removed for a distance of two feet from the point of burning or welding to prevent evolution of vapors/fumes.
- E. Consideration must be given to the safety requirements needed for the type of welding operation and the materials being welded. Appropriate procedures and PPE must be determined and included as part of the work plan.

6.10 Rescue and Emergency Services

- A. The following requirements apply to locations where personnel enter confined spaces to perform rescue services:
 - The Entry Supervisor shall confirm that each member of the rescue service is provided with, and is trained to properly use, personal protective and rescue equipment necessary for making rescues from confined spaces.
 - Each member of the rescue team shall be trained to perform his or her assigned rescue duties and each member shall also receive the training required of Authorized Entrants.
 - Each member of the rescue service shall practice making confined space rescues using dummies, mannequins, or actual persons and shall use representative spaces (e.g., spaces with the same configuration, opening size, and accessibility) to simulate the types of confined spaces from which rescue is to be performed. **This training shall be completed at least once every 12 months.**
 - Each member of the rescue service shall be trained in basic first aid and in Cardiopulmonary Resuscitation (CPR). At least one member of the rescue service shall hold current certification in First Aid and CPR.
- B. If the location arranges to have outside persons perform confined space rescue, the Entry Supervisor shall:
 - Inform the rescue service of the hazards they might confront,
 - Provide the rescue service with access to all permit spaces from which rescue may be necessary so that they can develop appropriate plans and practice rescue operations.
- C. To facilitate non-entry rescue, retrieval systems or methods shall be used, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant. Retrieval systems shall meet the following requirements:
 - Each Authorized Entrant shall use a full body harness with a retrieval line attached at the center of the entrant's back, near shoulder level or above the entrant's head. Wristlets may be used in lieu of the full body harness only if the Entry Supervisor can demonstrate that the use of a full body harness is infeasible or creates a hazard and that the use of wristlets is the safest and most effective alternative.

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NOTE: Use of wristlets is the least desirable method of lowering or raising personnel, and shall be considered only in extreme circumstances.

- The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the confined space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device shall be available to retrieve personnel from vertical type confined spaces more than 5 feet deep.
- D. If an injured entrant is exposed to a hazardous substance, the Material Safety Data Sheet (MSDS) or written information shall be made available to the medical personnel treating the exposed entrant.

6.11 Terminating a Confined Space Entry

- A. The Entry Supervisor shall terminate entry and cancel the entry permit when:
- The entry operations covered by the entry permit have been completed, or
 - A condition that is not allowed under the entry permit arises in or near the confined space.
- B. Upon termination of entry and cancellation of the Confined Space Entry Permit, the Entry Supervisor shall confirm that:
- Personnel are out of the confined space and accounted for;
 - Equipment has been removed from the space;
 - Entry portals are restored to operating conditions;
 - Inlet and outlet piping is restored to service;
 - Safety and automation systems are restored to normal service;
 - The Confined Space Entry Permit is removed from the work area;
 - Affected personnel (BP and contractors) are debriefed to identify any deficiencies or hazards encountered during the entry. The debriefing and any deficiencies identified shall be documented on the canceled permit for future review.

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6.12 Exceptions

There are two exceptions to the required use of the confined space entry permit procedures that are dependent upon the nature of the confined space.

1. Alternative Entry Procedures, and
2. Permit Space Reclassification Procedures (non-permit confined spaces).

A. Alternative Entry Process

Alternative entry process may be used when the only hazard in the space is a potentially hazardous atmosphere. These are spaces that:

- Do not normally contain a hazardous atmosphere, but that might under certain conditions and
- Personnel may enter periodically.

Conditions to be met to qualify for the alternative entry procedures:

- The only hazard posed by confined space is a potentially hazardous atmosphere.
- Visual inspection and air monitoring tests confirm that the only potential hazard is a hazardous atmosphere.
- Continuous forced air ventilation shall be used.
- If initial entry is necessary to obtain the above data, it shall be performed under the full requirements of a permit-required confined space entry.

Entry shall be in accordance with the following requirements:

- Any condition making it unsafe to remove an entrance cover shall be eliminated before removing the cover. When entrance covers are removed, the opening shall be promptly and effectively guarded.
- Before entry, the internal atmosphere shall be tested with a calibrated direct-reading instrument at the working level for the following conditions, in the following order:
 1. Oxygen content between 19.5–23.5 percent oxygen by volume
 2. Flammable gases and vapors less than or equal to 10 percent of Lower Explosive Limit (LEL)
 3. Potential toxic air contaminants exceeding the OSHA Permissible Exposure Limit (PEL)
- There may be no hazardous atmosphere within the space whenever any employee is inside the space.

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- Atmosphere within the space shall be continuously monitored to confirm that ventilation is adequate. If a hazardous atmosphere is detected during entry:
 1. Each employee shall evacuate the space immediately.
 2. The space shall be evaluated to determine how the hazardous atmosphere developed.
 3. Measures shall be taken to protect personnel from hazardous atmosphere before any subsequent entry.
 4. The entrant shall notify a responsible individual that entry is being made and the intended duration of the entry. Upon completion of work in the space, the entrant shall inform the responsible individual that work is complete.
 5. Documentation of pre-entry air monitoring shall be maintained for all confined spaces entered using these Alternative Entry Procedures

B. Permit Space Reclassification

A permit space may be reclassified as a non-permit space if the following apply and are documented:

- Space may be reclassified for as long as the non-atmospheric hazards remain eliminated if:
 1. There are no actual or potential atmospheric hazards, and
 2. All hazards within the permit spaces are eliminated without entry.
- Hazards may be eliminated by such actions as purging or inerting tanks/vessels of contaminants, emptying material from hoppers/bins, and using lockout/tagout procedures for electrical/mechanical hazards. The control of atmospheric hazards through forced air ventilation does not constitute elimination of that hazard - it only controls the hazard and a Confined Space Entry Permit shall be used in such cases.
- If entry is required to eliminate hazards, it shall be performed under the full requirements of the permit-required confined space program. The space may be reclassified for as long as the hazards remain eliminated.
- Entry Supervisors shall certify in writing that all hazards in the permitted space have been eliminated and make this document available to each entrant. This certification shall contain the date, location of the space, and the signature of the Entry Supervisor.
- If hazards arise in a reclassified confined space, personnel shall exit and the Entry Supervisor determines whether to continue reclassification of the space.

NOTE: A combination of reclassification and alternative entry procedures (e.g., using lockout/tagout to eliminate a physical hazard, then continuous forced air to

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control an atmospheric hazard) shall not be used together. Situations as such shall require a permit before entry.

7.0 Training

- 7.1 Personnel shall be trained in the relevant aspects of their assigned duties regarding confined spaces when:
- They are first assigned confined space duties,
 - There is a change in assigned duties,
 - There is a change in confined space operations that presents a hazard about which an employee has not previously been trained,
 - The Issuing Authority (IA) believes that there are deviations from acceptable entry conditions or that an employee demonstrates a lack of training in the confined space entry procedures.
- 7.2 The training shall include at a minimum:
- Proficiency in the specific duties assigned,
 - The type of confined space to be entered,
 - Chemical or physical hazards involved,
 - Work practices and techniques,
 - Atmospheric testing procedures,
 - Personal Protective Equipment (PPE) required,
 - Rescue procedures.
- 7.3 All training shall be documented and the trainer(s) shall sign the training record. Records should be readily available for review by appropriate personnel.

8.0 Annual Review

- 8.1 The Permit-Required Confined Space program shall be reviewed at least once a year (self-assessed) unless no entry is performed within the past 12 month time period.
- 8.2 Each completed/canceled permit must be reviewed within one year of its cancellation.
- 8.3 If deficiencies are noted, revisions shall be made to the program as necessary to protect personnel from the potential hazards of Confined Space entries.
- 8.4 Documentation of the annual program reviews/assessments shall be retained for one year from the review.

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9.0 Attachments

Attachment A: Confined Space Entry Permit



HSSE 13.41.01
Confined Space E...

Attachment B: Duties of the Standby Attendant



HSSE 13.42.01
Duties of an Att...

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Document Control Details

| Document Name | | Confined Space Entry | | | |
|----------------------|---------------|----------------------------------------------------|--------------------|-----------------------------------------------------------|------------|
| Scope | | BP Wind Energy | | | |
| Document # | | HSSE 13.40.01 | Issue Date | 03/15/2010 | |
| Revision Date | | 9/27/2011 | Next Review | 03/15/2013 | |
| Authority | | Pat West | COO BPWE | Custodian Dale Smith HSSE Advisor Operations | |
| Rev# | Revision Date | Revision Detail | | Authority | Custodian |
| 01 | 09/27/2011 | Changed "Authority" from Matt Sakurada to Pat West | | Pat West | Dale Smith |
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