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# Brunel Energy, Inc.

## Nitrogen Awareness

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## 1. Purpose

- 1.1. Brunel Energy, Inc., hereinafter referred to as, “the Company,” has established a program compliant with Occupational Safety and Health Administration to advise employees in areas where nitrogen is being used and to supply on an awareness level basis about the properties and hazards of nitrogen, general guidelines, and training requirements.

## 2. Applicability

- 2.1. This policy applies to employees, subcontractors and/or visitor(s) of the Company. For the purposes of this policy, an employee shall be considered on the job whenever he/she is:
  - 2.1.1. On or in, any Company or client property, including parking areas; or
  - 2.1.2. On Company time even if off Company premises (including paid lunch, rest periods and periods of being on call).
- 2.2. As a condition of employment, Company employees are required to abide by additional governmental or customer policies and requirements that may be imposed at a worksite in addition to the requirements of these policies and procedures. Nothing set forth in this policy constitutes, construes, or interprets in any way as a contract of employment.

## 3. Definitions

- 3.1. **Nitrogen** is the chemical element of atomic number 7, a colorless, odorless unreactive gas that forms about 78 percent of the earth's atmosphere. Liquid nitrogen (made by distilling liquid air) boils at 77.4 kelvins (−195.8°C) and is used as a coolant.
- 3.2. **Oxygen-deficient atmosphere** is any atmosphere that contains less than 19.5 percent oxygen.
- 3.3. **Fresh air** is the air outside as opposed to that within a room or other enclosed space.

## 4. Responsibilities

- 4.1. Manager
  - 4.1.1. In coordination with the Safety Manager, develop and implement nitrogen awareness training.
  - 4.1.2. Ensure personnel are aware of work that has the potential of exposure to nitrogen.
  - 4.1.3. Identify possible locations where nitrogen in the workplace may be used.
  - 4.1.4. Inform the Safety Manager of upcoming work involving nitrogen, allowing the Safety Manager to provide any necessary monitoring or other required actions.
  - 4.1.5. Ensure employees comply with the nitrogen awareness requirements.
- 4.2. HSE Supervisor

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4.2.1. Coordinate annual nitrogen awareness training activities.

4.3. Employee(s)

4.3.1. Comply with the nitrogen awareness requirements and direct any questions or concerns to the Safety Manager.

4.3.2. Attend required annual training.

**5. Procedure**

5.1. Hazards of Nitrogen is an inert gas, which means that it does not react with other chemicals under most normal circumstances. Nitrogen is often used in industrial settings to displace other gases that are toxic, corrosive, reactive or prevent fire or explosion hazards, making processes safer. Using nitrogen to remove oxygen from process equipment decreases the chances of a fire or explosion, but it also can make the atmosphere in and around the equipment hazardous for humans to breathe.

5.2. Hazard Identification

5.2.1. Oxygen-deficient atmospheres in confined spaces can be deadly in only a few breaths. An oxygen-deficient atmosphere rapidly overcomes the victim. There is no warning before being overcome.

5.2.2. An oxygen-deficient atmosphere might exist outside a confined space opening.

5.2.3. Entering oxygen-deficient atmospheres should never be attempted under any circumstances without training and proper air-supplied breathing equipment.

5.2.4. Pre-job planning and walk downs with the entire work team should emphasize confined space entry restrictions, especially when unsecured confined space access points are in the work area.

5.2.5. Confined space hazard warnings must be maintained at all times while the access opening is not secured.

5.2.6. Pre-job walk downs should accurately identify all equipment where inert gas purging may be venting into the work area.

5.2.7. Barriers and warnings should be maintained around open purge vents at all times during purging activities.

5.2.8. Rescuers must strictly follow safe rescue procedures.

5.3. Pre-Job Planning for Nitrogen Related Work

5.3.1. Pre-job planning or a site assessment will be conducted prior to starting work and the assessment will be documented. Documented planning will be conducted for those operations involving potential nitrogen exposure, and this includes anytime an active purge is being applied to a system in or around equipment associated with work. Some planning or assessment elements include:

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- 5.3.2. All proposed work requires a jobsite visit by the requestor and a unit operator to identify special precautions, equipment status, and personal safety equipment requirements.
- 5.3.3. The conditions for marking a “nitrogen purge or inerted” (Yes/No/NA) status box.
- 5.3.4. The permit must clearly identify all hazards and special personal protective equipment requirements.
- 5.3.5. “Fresh Air” work restrictions apply to “Set up only” permits whenever an IDLH atmosphere is suspected or known to be present in the work area.
- 5.3.6. The requirements to maintain posted warnings at all access points to confined space temporary openings.
- 5.3.7. Appropriate barricades will be utilized if determined by the site assessment. As determined by the hazard assessment, nitrogen vent / purge points will be labeled and barricaded. Barricades will provide a safe zone of 3' in diameter or greater if determined by oxygen monitoring results. As determined by the hazard assessment, nitrogen vent / purge points will be labeled and barricaded with a 3' diameter or as determined by oxygen monitoring (must be greater than 19.5% outside of the barrier.)
- 5.3.8. Appropriate signage will be utilized and adhered to. Appropriate signage will include adequate warning by stating Danger, Inert Gas Present or Possible Oxygen Deficient Environment.
- 5.4. Safe Rescue Awareness
  - 5.4.1. The powerful human instinct to help someone in distress, especially a friend or co-worker, all too frequently results in multiple confined space incident victims.
  - 5.4.2. Workers suddenly involved in emergency activities must not allow emotions to override safe work procedures and training. Only qualified and trained personnel equipped with the necessary safety equipment should attempt a rescue.
- 5.5. Cylinder Handling and Storage
  - 5.5.1. All nitrogen cylinders shall contain an identifying label. Nitrogen cylinders shall contain an identifying label UN1066. See below as an example:

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- 5.5.2. Proper handling and storage of nitrogen cylinders includes the requirements that the cylinder(s) should be upright, properly supported and stored outdoors or in a well-ventilated area. Cylinder(s) shall be chained or otherwise secured to prevent movement.
- 5.5.3. Data sheets must be available for nitrogen.
- 5.5.4. A protective cap must be in place when the cylinder is not in use.
- 5.5.5. The correct size and type of trolley or cart should always be used for the safe transportation of gas cylinders.
- 5.5.6. Nitrogen must not be used to power pneumatic tools or blowers. Nitrogen must not be used to power pneumatic tools or blowers except when they are used in an inert atmosphere.

## 6. Training

- 6.1. Employees will be trained in nitrogen hazards. The Company shall provide training for all affected employees including any Company employee working with or near nitrogen and the training shall emphasize:
  - 6.1.1. An oxygen-deficient atmosphere rapidly overcomes the victim.

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- 6.1.2. There is no warning before being overcome.
- 6.1.3. An oxygen-deficient atmosphere might exist outside a confined space opening.
- 6.1.4. Rescuers must strictly follow safe rescue procedures.
- 6.2. Documentation of training - Nitrogen awareness training shall be documented including dates of training, location of training, employee name and trainer name.
- 6.3. Training records shall be provided upon request all materials relating to the employee information and training program to regulatory agencies.

## **7. Reference**

- 7.1. OSHA 1910 Subpart H, Hazardous materials