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Brunel Energy, Inc.

Hexavalent Chromium

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1. Purpose

- 1.1. Brunel Energy, Inc., hereinafter referred to as, “the Company,” has established a program to provide employees with general knowledge and guidelines enabling employees to anticipate, recognize, evaluate, and better participate in controlling their exposure to Hexavalent Chromium particularly in areas where welding processes may contain compounds of chromium, including hexavalent chromium and of nickel.

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.
- 2.3. Note: The Company has gathered enough raw data (industrial hygiene monitoring and shared industry data) to show that outside laydown yards/large warehouse fabrication shops and safety attendants outside the confined space will fall into the exception as noted below so nothing new outside of normal permit/client/regulatory required PPE conditions will be necessary.
- 2.4. However, we do not have enough data to prove that we are under the standard (November 27th, 2006) when working in confined spaces with Hex Chrome, and therefore will have to make some changes to work involving welding of chromium (VI) in confined spaces.
- 2.5. Exception to the standard: Where the employer has objective data demonstrating that a material containing chromium or a specific process, operation, or activity involving chromium cannot release dusts, fumes, or mists of chromium (VI) in concentrations at or above 0.5 µg/m³ as an 8-hour time-weighted average (TWA) under any expected conditions of use.

3. Definitions

- 3.1. **Action Level** = a concentration of airborne chromium (VI) of 2.5 micrograms per cubic meter of air (2.5 µg/m³) calculated as an 8-hour time-weighted average (TWA)
- 3.2. **Chromium (VI) [hexavalent chromium or Cr (VI)]** means chromium with a valence of positive six, in any form and in any compound.

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- 3.3. **Emergency** means any occurrence that results, or is likely to result, in an uncontrolled release of chromium (VI). If an incidental release of chromium (VI) can be controlled at the time of release by employees in the immediate release area, or by maintenance personnel, it is not an emergency.
- 3.4. **Employee Exposure** means the exposure to airborne chromium (VI) that would occur if the employee were not using a respirator.
- 3.5. **Regulated Area** means an area, demarcated by the employer, where an employee's exposure to airborne concentrations of chromium (VI) exceeds, or can reasonably be expected to exceed the PEL.

4. Responsibilities

- 4.1. Manager(s) shall:
 - 4.1.1. Monitor the overall effectiveness of the program.
 - 4.1.2. Ensure employees have Protective Equipment as needed.
 - 4.1.3. Ensure training for affected employees and supervisors.
 - 4.1.4. Provide technical assistance as needed.
 - 4.1.5. Preview and update the program on at least an annual basis, or as needed.
- 4.2. HSE Supervisors(s) shall:
 - 4.2.1. Support management in the implantation of this policy.
 - 4.2.2. Ensure the procedures described in this program are followed.
 - 4.2.3. Ensure employees are properly trained and equipped to perform their duties safely.
 - 4.2.4. All required inspections, tests, and recordkeeping functions have been performed.
- 4.3. Employee(s):
 - 4.3.1. Must comply with this policy.
 - 4.3.2. Responsible for reporting hazardous practices or situations as well as reporting incidents that cause injury to themselves or others to their manager or supervisor.
- 4.4. Subcontractor(s):
 - 4.4.1. Must comply with this policy.
 - 4.4.2. Responsible for reporting hazardous practices or situations as well as reporting incidents that cause injury to themselves or others to their manager or supervisor.

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5. Requirements

5.1. Regulated Areas and Authorized Personal Access

- 5.1.1. The hexavalent chromium standard for general industry, 29 CFR 1910.1026, requires the employer to establish a regulated area wherever a worker's exposure to airborne concentrations of Cr (VI) is, or can be reasonably expected to be, above the PEL.
- 5.1.2. In areas where practical difficulties exist in establishing regulated areas, the Company will distinguish the regulated areas from the rest of the workplace by means of warning signs, gates, ropes, barricades, lines, textured flooring, or other methods deemed appropriate. Whatever method is selected, only authorized employees shall enter the area.
- 5.1.3. Authorized personnel are those employees whose job duties require them to be in the area and may include maintenance personnel, managers, and quality control engineers. In addition, designated worker representatives may enter the regulated area to observe exposure monitoring.
- 5.1.4. All people who enter the regulated area must use proper protective equipment, including respirators when appropriate.
- 5.1.5. Employees are not permitted to eat, drink, smoke, chew tobacco or gum, or apply cosmetics in regulated areas.

5.2. Health Effects

- 5.2.1. Depending upon the level of exposure, Hexavalent Chromium can irritate the nose, throat, and lungs, leading to nasal ulcers, lung cancer, and can cause skin rashes, skin ulcers and permanent eye damage.
- 5.2.2. Stainless Steel contains nickel and chromium. Nickel can cause asthma. Nickel and Chromium can cause cancer. Chromium cancer may not show up for 10 to 40 years. Like the effects produced by fumes from other metals. It can cause symptoms such as runny nose, sneezing, coughing, sores in nose and on skin, nausea, headaches, dizziness, and respiratory irritation.
- 5.2.3. Some people may develop sensitivity to chromium or nickel which can result in dermatitis or skin rash.
- 5.2.4. Prolonged skin contact can result in dermatitis and skin ulcers.
- 5.2.5. Some workers develop an allergic sensitization to chromium.
- 5.2.6. In sensitized workers, contact with even small amounts can cause a serious skin rash.
- 5.2.7. Kidney damage has been linked to high dermal exposures.

5.3. Exposure Limits

- 5.3.1. The U.S. Department of Labor establishes maximum limits of exposure to chromium for all workers covered, including a Permissible Exposure Limit and Action Level.

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- 5.3.2. The Permissible Exposure Limit, (PEL) maximum exposure limit for workers exposure to chromium are as follows:
- 5.3.3. .5 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) of air – When airborne concentrations are at or below this level, the standard is not applicable.
- 5.3.4. 2.5 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) of air – When airborne concentrations are at or above 2.5 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) of air (this is the Action Level), but under 5 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) of air, areas shall be clean, no eating and drinking and proper housekeeping shall be completed to avoid the accumulation of dust.
- 5.3.5. 5 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) of air – Airborne concentrations above this level require respiratory protection, monitoring every six months, and if monitoring reveals exposures to be above PEL, periodic monitoring every 3 months annual medical surveillance, and Hazard Communication Training.

5.4. Exposure Monitoring and Control

- 5.4.1. The Company must ensure that no employee is exposed to an airborne concentration of hexavalent chromium for more than PEL without regard to use of PPE.
- 5.4.2. A description of each activity in which chromium is emitted.
- 5.4.3. Specific plans to achieve engineering and work practice controls when exposure level exceeds the PEL for more than 30 days per year.
- 5.4.4. Additional monitoring when there has been a change in production process, raw materials equipment, personnel, work practices, or control methods that may result in new or additional exposure to chromium, or when any new or additional exposure has occurred.
- 5.4.5. Information on the technology considered meeting the PEL.
- 5.4.6. Air monitoring data that document the source of chromium emissions.
- 5.4.7. A work practice program including regulations for the use of:
 - 5.4.7.1. Protective work clothing, equipment, air monitoring, housekeeping, and hygiene guidelines.

6. Procedure

6.1. Compliance Program

- 6.1.1. Prior to each job where employee exposure exceeds the PEL, the Company will establish a program to reduce employee exposure to the PEL or below. The compliance program will provide the following:
 - 6.1.1.1. A description of each activity in which chromium is emitted.
 - 6.1.1.2. Specific plans to achieve engineering and work practice controls when the exposure level exceeds the PEL for more than 30 days a year.

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- 6.1.1.3. Information on the technology considered meeting the PEL.
- 6.1.1.4. Air monitoring data that document the source of chromium emissions.
- 6.1.1.5. A work practice program including regulations for use of protective clothing, equipment, air monitoring, housekeeping, and hygiene guidelines.
- 6.1.2. An employee should report to their supervisor or manager if they feel:
 - 6.1.2.1. Exposed to at or above safe levels.
 - 6.1.2.2. Experience symptoms of exposure
 - 6.1.2.3. Are exposed to an emergency of an uncontrolled release.
- 6.2. Engineering Controls
 - 6.2.1.1. Ventilation such as local exhaust systems that capture airborne Cr (VI) near its source and remove it from the workplace.
 - 6.2.1.2. Local exhaust or shop fans extract fumes from work areas.
 - 6.2.1.3. Dust collection systems with HEPA filters
 - 6.2.1.4. Substitute less toxic material or a process that results in lower exposures for a process that causes higher exposures.
 - 6.2.1.5. Isolation such as placing a barrier between employees and source of exposure.
- 6.3. Safe Work Practice Controls
 - 6.3.1. Maintenance of separate hygiene facilities (change rooms, showers, hand wash facilities and lunch areas), and proper housekeeping practices will be maintained.
- 6.4. Over-Exposure Protection
 - 6.4.1. Use enough ventilation or exhaust at the arc or both to keep fumes and gases from your breathing zone and general area.
 - 6.4.2. Use localized exhaust ventilation to remove fumes and gases from their source in still air. Keep the exhaust trunk/hood as close to the fume source as possible to keep fumes and gases from your breathing zone.
 - 6.4.3. If ventilation is questionable, use air sampling to determine the need for corrective measures.
 - 6.4.4. OSHA says you must remove all paint and solvents before welding or torch cutting.
 - 6.4.5. Follow written instructions.
 - 6.4.6. Make sure all residues are removed.
 - 6.4.7. Use the safest welding method for the job.
 - 6.4.8. In a confined space, follow all the OSHA confined space rules – like air monitoring, not storing torches in the space, and ventilation.
 - 6.4.9. Do not breathe fumes and gases. Keep your head out of the smoke plume.

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- 6.4.10. Use proper Protective Protection Equipment.
- 6.4.11. Position your welding hood so that fumes will not rise under it and into your breathing zone.
- 6.4.12. If the ventilation is not adequate, such as confined spaces, respiratory protection is required.
- 6.4.13. When respiratory protection is required, be sure that you have the required training and proper respirator before starting work.
- 6.4.14. Implement good housekeeping procedures. Keep the area as free as practicable of accumulations of chromium dust and buildup.
- 6.4.15. Vacuums with HEPA filters should be used to keep dust emissions at a minimum.
- 6.4.16. Do not blow dust from clothing with an air hose. Doing so can embed the dust particles into your skin and eyes and expose others to airborne particles.
- 6.4.17. Wash hands and face at the end of every shift and before eating, drinking, smoking, chewing gum, applying cosmetics, or using the bathroom.
- 6.4.18. Never eat or drink in areas where Hexavalent Chromium may contaminate food, skin, or eyes.
- 6.4.19. Keep exposure as low as possible.
- 6.5. Personal Protective Equipment (PPE)
 - 6.5.1. The Company will provide and ensure the proper use of personal protective equipment where employees are exposed to chromium above the PEL. PPE will be provided at no cost to the employee.
 - 6.5.2. Employees shall wear the following PPE when deemed necessary:
 - 6.5.2.1. Long-sleeved shirt, welding jacket or welding sleeves.
 - 6.5.2.2. Long pants.
 - 6.5.2.3. Safety glasses or goggles.
 - 6.5.2.4. Face shield over eye protection when grinding.
 - 6.5.2.5. Welding helmet over eye protection when welding.
 - 6.5.2.6. Appropriate respirator when needed.
- 6.6. Respirators
 - 6.6.1. When engineering and administrative controls do not reduce hazards below the OSHA's permissible exposure level (PEL), employees must wear respirators. The Company will provide respiratory protection for the employee at no cost and will ensure that the respirator is used when employee exposure to chromium exceeds the PEL and/or the employee requests a respirator.
- 6.7. Housekeeping

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- 6.7.1. All areas contaminated with chromium (VI) will be cleaned by HEPA-filter vacuuming or other methods that minimize the likelihood of exposure.
- 6.7.2. Employees shall ensure that all environmental work surfaces are kept as free as practicable of accumulations of Cr (VI)-containing materials. Waste, scrap, debris, and other materials with Chromium VI must be placed in impermeable bags and labeled according to the Hazard Communication Standard prior to disposal.
- 6.7.3. Accordingly, any spills and releases of Cr (VI)-containing materials in the workplace must be promptly cleaned up and disposed of in accordance with environmental regulations for hazardous waste disposal.
- 6.8. Medical Surveillance
 - 6.8.1. While work should not expose employees to at or above the action level for 30 or more days, if those levels are reached, then a written exposure plan including annual reviews and updates will be required.
 - 6.8.2. Should employee(s) become exposed to it, or above action levels related to work exposures and Hexavalent Chromium VI, then employees will receive a medical evaluation, which will include tests to determine exposure and a medical history. This is provided at no cost to the employee. As with all medical records, these are kept strictly confidential.
 - 6.8.3. The employee or representative is entitled to see the records of measurements of the exposure.
 - 6.8.4. The employee can also request that medical records for exposure be furnished to the employee's personal physician or designated representative.
 - 6.8.5. A medical surveillance program including notifications and medical follow-ups will be required for any employee who is exposed (medical examination to include:
 - 6.8.5.1. Medical work history, with employees on past, present, and anticipated future exposure to chromium (VI).
 - 6.8.5.2. Any history of respiratory system dysfunction; any history of asthma, dermatitis, skin ulceration, or nasal septum perforation:
 - 6.8.5.3. Smoking status and history; physical examination of the skin and respiratory tract.
 - 6.8.5.4. Any additional tests deemed appropriate by the examining physician.
 - 6.8.6. If any employee exposure exceeds the PEL, the Company will notify the employee within 15 days in writing of the exposure.

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7. Training

- 7.1. The Company will provide the requisite training to ensure that our employees acquire an understanding of the kinds of monitoring, testing, and protective measures required by OSHA's Hexavalent Chromium regulations. All employees who have a reasonable potential for exposure to Hexavalent Chromium above the OSHA PEL shall receive training. The training shall be performed prior to initial assignment and shall be repeated annually.
- 7.2. The training shall include:
 - 7.2.1. The content of the standard.
 - 7.2.2. The sources and types of exposure in their workplace
 - 7.2.3. Protective equipment used.
 - 7.2.4. Health hazards of Hexavalent Chromium
 - 7.2.5. Respirator use.
 - 7.2.6. Medical Surveillance
 - 7.2.7. The appropriate engineering controls and work practices.
- 7.3. Documentation will be kept in the employer's safety training file. Documentation will include:
 - 7.3.1. Outline or class name.
 - 7.3.2. The names and employee numbers of the employees who participated in the training.
 - 7.3.3. Names and signature of instructors, class date, and topic.

8. Recordkeeping

- 8.1. Monitoring data and training records will be maintained.

9. Reference

- 9.1. OSHA 1910.1026