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|--|--|----------------------|---------------------|----------|
| <b><i>E&amp;B Oilfield Services Inc.</i></b> | Activity:<br><b>Pipeline Technition / Gas Plant</b><br><b>Methanol Injection</b> |                      | Doc No:             | HAZ-ID   |
|  |  |                      | Initial Issue Date  | 4/1/2015 |
|  |  |                      | Revision Date:      | 4/1/2016 |
| <b>HAZARD IDENTIFICATION AND ASSESSMENT</b>  |  |                      | Revision No.        | 1        |
|  |  |                      | Next Revision Date: | 4/1/2017 |
| Preparation:<br>David Abegglen               | Authority: Danny Abegglen  | Issuing Dept: Safety | Page:               | 1 of 3   |

## Purpose

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- **Methanol Injection**

## Key Responsibilities

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- E&B Management will provide task appropriate training to all employees for Methanol Injection
- Supervisors / Leads are required to ensure all employees have adequate training
- E&B Employees should make sure they feel comfortable before left on their own while in training

## Hazard and Risk Identification

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Employees MAY be exposed to dangers While injection Methanol during (but is not limited) to the following activities:

- Filling methanol continuous injection tanks
- Injecting methanol into ongoing processes (such as gas plant equipment)
- Injecting methanol into active gas lines

## Risk Assessment

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Hazards are classified and ranked based on severity. The program identifies hazards are classified/prioritized and addressed based on the risk associated with the task. (See the risk analysis matrix outlining severity and probability).

Methanol is the simplest alcohol, and is a light, volatile, colorless, flammable liquid with a distinctive odor very similar to that of ethanol (drinking alcohol). However, unlike ethanol, methanol is highly toxic and unfit for consumption. At room temperature, it is a polar liquid, and is used as an antifreeze, solvent and fuel. Its flame is not visible in the daylight.

Methanol has a high toxicity in humans. If as little as 10 mL of pure methanol is ingested, for example, it can break down into formic acid, which can cause permanent blindness by destruction of the optic nerve, and 30 mL is potentially fatal. Methanol can be observed through the skin and as dangerous as ingestion.

Methanol injection also involves high pressure.

Methanol vapors may be heavier than air. They will spread along the ground and collect and stay in poorly-ventilated, low-lying, or confined areas (e.g., sewers, basements, and tanks). Hazardous concentrations may develop quickly in enclosed, poorly-ventilated, or low-lying areas. Liquid agent is lighter than water.

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**E&B OILFIELD SERVICES INC. RISK ASSESSMENT MATRIX – METHANOL INJECTION**

| CONSEQUENCE |                      |                  |                  |                     | PROBABILITY |        |             |                         |                         |
|-------------|----------------------|------------------|------------------|---------------------|-------------|--------|-------------|-------------------------|-------------------------|
| Severity    | People               | Assets           | Environment      | Reputation          | A           | B      | C           | D                       | E                       |
|             |                      |                  |                  |                     | Not Done    | Rarely | Once a week | Several Times in a Week | Multiple Times in a Day |
| 0           | No health effect     | No damage        | No effect        | No impact           |             |        |             |                         | X                       |
| 1           | Slight health effect | Slight damage    | Slight effect    | Slight impact       |             |        |             | X                       |                         |
| 2           | Minor health effect  | Minor damage     | Minor effect     | Limited impact      |             |        | X           |                         |                         |
| 3           | Major health effect  | Localized damage | Localized effect | Considerable impact |             | X      |             |                         |                         |
| 4           | Single fatality      | Major damage     | Major effect     | National impact     | X           |        |             |                         |                         |
| 5           | Multiple fatalities  | Extensive damage | Massive effect   | Global impact       | X           |        |             |                         |                         |

|            |   |  |                    |
|------------|---|--|--------------------|
| <b>Key</b> | Manage for continuous improvement (Low) | Incorporate risk reduction measures (Medium) | Intolerable (High) |
|------------|---|--|--------------------|



Methanol contamination of the eyes.

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### **Risk Controls/Methods to Ensure Identified Hazards Are Addressed and Mitigated**

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The following describes how identified hazards are addressed and mitigated:

- Proper PPE must be worn at all times.
- If splashing is possible, a face shield or chemical goggles are required.
- When used in conjunction with pressure, a face shield or chemical goggles are required.
- Contaminated clothing should be promptly removed.
- Exposed shin should be washed with water.
- Grounding procedures must be followed when pumping Methanol.
- When there is a possibility that Methanol is present, wet clothing should be considered as contaminated with Methanol. Ignition sources (including smoking) must be avoided.

### **JSA Sample**

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The following describes how identified hazards are addressed and mitigated:

| Basic Job Step                     | Potential Injury or Hazards | Mitigation / Tools                                   |
|------------------------------------|-----------------------------|--|
| Injecting Methanol into a gas line | Fire                        | Avoid accidental release.<br>Avoid ignition sources. |

### **Other Info**

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