

Pipe Restraints/Installation

Custodian: Canadian EH&S
Date approved: 08/20/2013

Purpose

This practice defines the Encana Canadian Division's minimum standards and expectations regarding the hazards and appropriate controls with pipe under pressure restraint issues as they relate to early lifecycle wells.

Definitions

Term	Definition
Term	Description/definition of term
Early Life Cycle	The early stages of a well from rig release to initial production
Contractor	A company Encana has selected to perform a service. The individual performing the service is specified (e.g., site representative or site supervisor) as acting as an agent for Encana.
Service Provider	A company Encana has selected to perform a service without specifying the individuals who provide the service (e.g., Ensign Drilling or Halliburton).
Onsite Service Providers	Service providers that perform work for Encana on an Encana field site (e.g., wellsite, pipeline, seismic line, road, and facility).
Restraint System	Nylon Sling Wire Rope/chain
Energized Frac	Utilize any CO ₂ /N ₂ compressible gas as a component of the fluid system in any quantity or rate.
Non-energized Frac	Cross-linked fluid at any rate
Slickwater	Any non-gelled fluid that is pumped at any rate with sand
Staff	Includes all Encana employees and contractors hired to conduct work on Encana's behalf.

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Scope and application

This practice applies to the type of pipe restraint systems and pipe installation requirements that are required on Encana Corporation well sites for temporary pipe as per the Early Lifecycle Well Activities (P3) including: Fracturing Operations (Energized, Non-Energized and Slickwater), Auxiliary Positive Pumping Services, and Flow Back Production Testing.

Responsibilities of staff and service providers

Encana staff and service providers working on drilling, completions and production sites are responsible to have read, understand and adhere to the expectations and controls detailed in this practice.

Business and site leadership

- Ensure that all staff and service providers under their control comply with the requirements of this practice and associated procedures.
- Ensure training is provided to workers required to supervise or hire worksite service providers
- Keep records of employee training in the Talent Management System (Talent Hub).

Worksite Supervisors

- Ensure staff adhere to this practice and develop site-specific procedures as required
- Communicate procedures / practice to affected workers
- Respond to worker questions directly or by seeking additional feedback from Health and Safety (H&S) personnel.
- Provide feedback to business unit and corporate management concerning the value and effectiveness of this practice and all associated procedures.

EH&S personnel

- Assist the business in complying with this practice and its associated processes by familiarizing themselves with all applicable regulations and guidelines
- Respond to questions or concerns relating to the interpretation of this practice and all associated processes
- Support the business and the service providers by promoting the Encana Pressure and Pipe Principles in early lifecycle well operations.

Service Providers

- Ensure the company adheres to Encana Pressure and Pipe Principles.
- Have a documented treated iron management inspection program

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Training requirements for staff and service providers

Staff

- Training for Encana staff, required in this practice, shall be managed in Encana's TalentHub.

Service Providers

- All Service Providers are required to have only qualified people to install restraint systems.
- All Service Providers are required to adequately train their employees on the proper installation of temporary iron and temporary union's utilization.

Controls

Pipe safety restraint systems are designed to help limit the amount of damage from line failures during pressure pumping operations. Pumping hazardous energy sources increases the potential risk of pipe rupturing and without safe guarding the pipe; it may become a projectiles causing injury or death. It is recommended that safety restraint systems be used on and temporary joint piping, hammer unions, hoses, etc.

Types of Restraints

- Flow Line Safety Restraint (Engineered Nylon slings)
- Wire rope safety lines not less than 11 mm (7/16th) in diameter

Where Restraints should be installed

- As per the Restricted Access Zone Standard, restraints are required to be installed on all temporary piping on the following equipment in the following areas:
 - All pressure testing equipment such as wellheads, flow lines, pipelines, well control equipment
 - During hydraulic fracturing operations from pressure pumping equipment and treating iron to the wellhead.
 - Wellhead and pressure piping that are open during active operations such as snubbing, e-line, slick-line, coil tubing, fracturing, acidizing, flow back.
- (Red Zone), restraints need to be installed on all piping identified within this area. (Note: the area can be modified upon placement of additional equipment which is tied into the well and or the frac spread.

Iron Management Program

- All Service Providers are expected to utilize an Iron Management Inspection Program.
- Utilize the proper size iron for the frac gradient expected
- Iron integrity/Installation process
 - All sections of temporary piping shall be installed so as not to impinge on fittings and valves
 - When making up Hammer Unions and flanges, non-sparking tools such as sledge hammers should be utilized.

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- For Temporary pipe where energized fluid transport is required or there is a possibility of connection failure the temporary pipe shall be suitably restrained.

Personal Protective Equipment

- Refer to the Personal Protective Equipment Practice.

Risk Assessment

An Encana risk assessment will be completed for business units requesting exemption from the utilization of pipe restraint systems. The operational risk assessment must be approved by the corresponding level as per the Encana Risk Matrix and a peer review of a cross-section of subject matter experts in order for a exemption to be utilized.

Disciplinary actions

Role	Description
Service Provider	Appropriate disciplinary action up to and including dismissal from the worksite and / or loss of contract services must be taken based on the severity of the violation and individual circumstances.
Staff	Appropriate disciplinary action up to and including termination must be taken based on the severity of the violation and individual circumstances.

Appendices/Support information

Appendix I

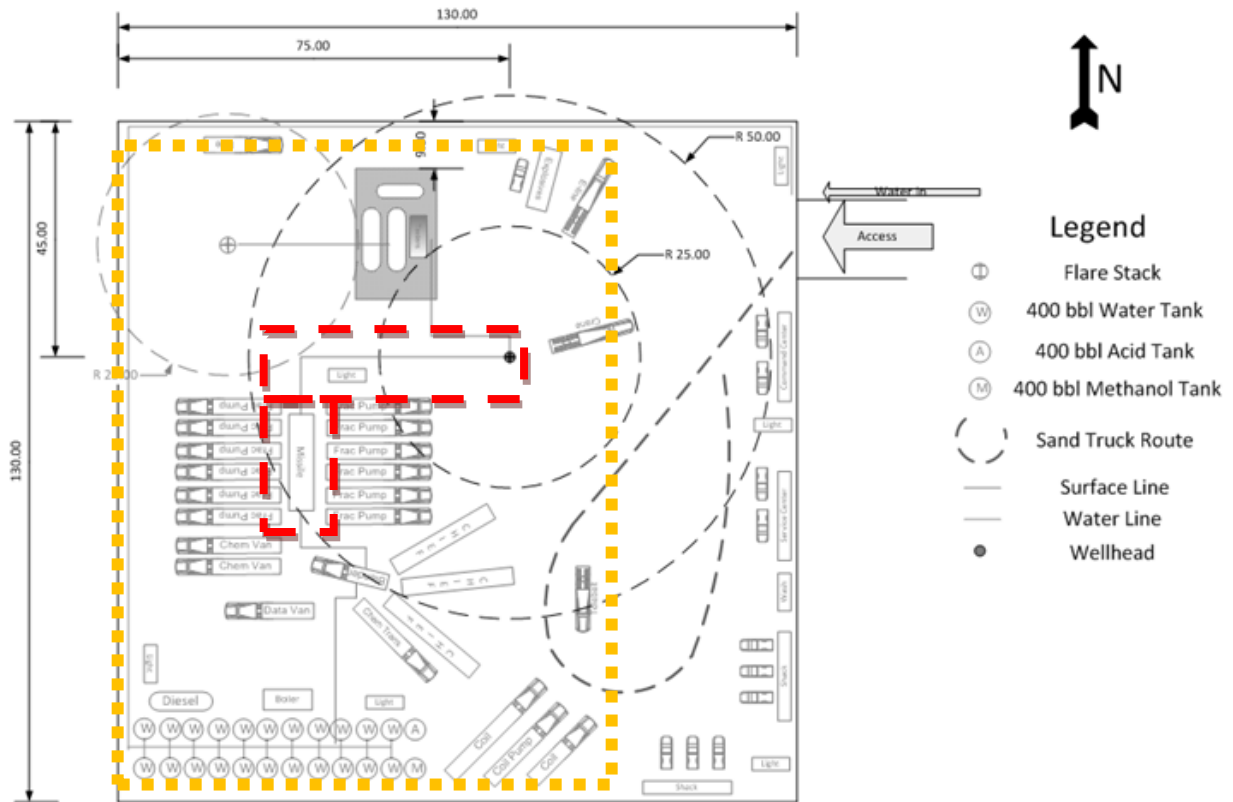
1. Energized Frac System
 - Utilize any CO₂/N₂ compressible gas as a component of the fluid system in any quantity or rate.
2. Non-energized Frac
 - Cross-linked fluid at any rate
3. Slickwater
 - Any non-gelled fluid that is pumped at any rate with sand

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Appendix II

Frac Example



Note: This is an example of a frac spread and this can be dynamic with additional components added which would increase the Red Zone. Refer to the Restricted Access Standard for more detail.

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Regulations & reference material

Owner	Name
Alberta	<ul style="list-style-type: none"> ▪ Occupational Health & Safety Code
British Columbia	<ul style="list-style-type: none"> ▪ OHS Regulation & Related Materials, Part 23 (23.69), Oil and Gas
Encana specific	<ul style="list-style-type: none"> ▪ Pressure and Pipe Principles : Early Lifecycle well operations

Change management

This practice should be reviewed, refreshed, and approved annually to ensure alignment with current regulations, corporate policy, and industrial best practices. Regulatory changes and incident investigations may dictate a shorter review cycle. To suggest changes or provide comments, please email CDEH&S@encana.com.

Record keeping

Please refer to the Encana Canadian Division EH&S [Records Management Practice](#).

Revision History

Rev	Description of Change	Date	Sign Off		
			Owner	Reviewers	Approver