ethos OPERATIONAL EXCELLENCE Practice	Well Shut-in Practice - Attachment 1
Owner: USA Division Safety **Revision No: 00**	**Date last revised:** 01/14/2013

1.0 Applicability

This practice applies to all Encana Oil & Gas (USA) Inc. (Encana) employees and contractors at all facilities owned or operated by Encana.

2.0 Purpose

The purpose of this practice is to establish minimum shut-in requirements for wellbores, wellheads or associated facilities. These minimum requirements must be in place prior to conducting any activities that may impact the integrity of the above, and are designed to prevent the uncontrolled or unplanned release of energy.

3.0 Definitions

Term	Definition
Shut-in	To identify and control all potentially harmful energy sources related to wellbores, wellheads or associated facilities.
Facilities	Above and below ground pressure vessels, flow lines, piping, tanks etc.
Christmas Tree	Assembly of equipment, including tubing-head adapters, valves, tees, crosses, top connectors and chokes attached to the uppermost connection of the tubing head, used to control well production
Master Valve	Lowermost valve on the vertical bore of the christmas tree
Pressure Integrity	Structural and leak-resistant capability of a product to contain applied pressure
Wellhead	All permanent equipment between the uppermost portion of the surface casing and the tubing-head adapter connection
Wing Valve	Valve located on the christmas tree, but not in the vertical run, which can be used to shut off well flow

4.0 Core information and requirements

The core information and requirements of this practice include the following:

4.1 Hazard Elimination

4.2 Hazard Control

4.3 Standard Operating Procedure(s)

4.1 Hazard Elimination

Any activity that has the potential to impact the integrity of wellbores, wellheads or associated facilities can only be carried out once all harmful energy sources are identified and appropriate controls implemented.

Increased exposure to fluids, frac proppants and high pressures in today's wells has increased the number of pressure/ equipment related early life cycle well incidents and near hits. Shutting in a well head or BOP does not always eliminate stored energy in associated flow lines and surface facilities. Proppant blockages, dead fluid legs, hydrates and equipment malfunction can lead to trapped pressure. Standard Operating Procedures need to be developed to identify and eliminate any stored energy before flow lines and equipment can safety be worked on or around.

The temporary nature of early life cycle well flow lines (hammer unions, no x-rays, support structures), combined with the uncertainty in flow back product and pressure creates conditions warranting additional controls. Integrity management programs need to address the accelerated potential for blockages, pipe and valve failures.

4.2 Hazard Control

Controls that can be used to reduce or eliminate the hazards include; equipment configuration (gravity drainage, fewer connections, clear labeling), equipment standards (iron quality, valve quality, inspection frequency), pressure gauges/ indicators, double block and bleed configurations, and administrative controls including site specific procedures and programs. Redundancy should be built in to ensure that the failure of one control will not result in an incident. This could include a double block and bleed system, combined with no go zones, and line restraints.

4.3 Standard Operating Procedures

Standard Operating Procedure(s) must address the following minimum requirements;

- An approved Engineered Well Program must be in place prior to initiating work on a wellbore.
- Permanent facilities must be constructed in alignment with approved engineered designs that meet all applicable regulatory standards.
- Changes to the Engineered Well Program or engineered facility design must follow the current Encana MOC process.
- Service provider procedures must be in alignment with Encana best practices and procedures.
- Prior to conducting work that has the potential to impact the integrity of wellbores, wellheads or facilities, a Hazard Assessment and/or Work Permit must be completed.
- The Hazard Assessment/Work Permit must address,
    - Scope of work
    - Risk mitigation/controls
    - Responsible parties
    - Communication
    - Energy isolation
    - Physical barriers

- Fire and explosion hazard
- Concurrent operations
- Emergency response
- Training and competency requirements

5.0 Roles and responsibilities

USA Division EH&S	Responsible for developing, implementing, communicating, evaluating, maintaining, and improving this practice. Implementation consists of making this practice available to all staff through Encana's intranet and providing appropriate training materials and system tools for use by the business units (BUs). Evaluation consists of, at a minimum, the performance of Ethos audits within the BUs or sub-business units (SBUs) on a routine basis. Based on the results of audits and requests from staff for modifications, USA Division EH&S will make appropriate changes to the practice to maintain and improve it.
BU EH&S	Responsible for helping implement this practice within their respective BU and SBUs.
BU leadership	Responsible for implementation of this practice in their BU or SBU through providing adequate resources to support the practice.
BU staff	Responsible for following this practice and incorporating its requirements into their work.

6.0 Goals, objectives and performance measures

Business Unit performance measures related to this Practice, if any, are incorporated into Scorecards. Individual performance measures related to this Practice are incorporated into High Performance Contracts (HPCs).

7.0 Training

The Encana or contractor supervisor is responsible for assuring that each well operator or service provider is competent to operate and shut-in the equipment he or she will use. Refresher training for this practice shall be provided when:

- the operator has been involved in an accident or near-hit incident;
- the operator has received an intervention and evaluation that reveals that he or she is not operating the equipment safely;
- a condition in the workplace changes in a manner that could affect safe operations;
- An evaluation of each operator’s performance shall be conducted once every 3 years, at a minimum.

8.0 Resources

BUs shall identify, allocate, and verify appropriate resources to communicate and implement this practice.

9.0 Associated forms, documents, and references

9.1 Documents/references

- P3 Fact Sheet

9.2 Decision Record and Implementation Plan

The Decision Record documents how this practice was developed and pertinent decisions made during the development. The Implementation Plan documents the purpose and audience of the practice as well as changes that were made either from the previous version of the practice or from standard operations. These records can be located by clicking on the links below:

- Decision Record for the Well Shut-in Practice - Attachment 1
- Implementation Plan for the Well Shut-in Practice - Attachment 1

Attachment 1

Well testing and stimulation work can subject equipment to exceptional short term corrosion and erosion. The frequency of inspections required by a quality assurance program will depend on the nature of the work. However, they should be at least annual and after severe service. Severe service includes flow backs of acids, solvents, a substance with a large amount of chloride, C02, or H2S, and fracturing sand or other **well** debris

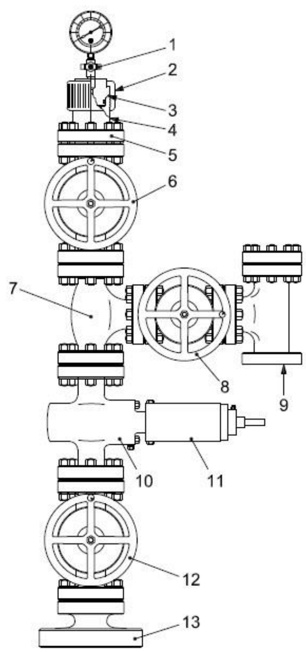
Master valves are normally in the fully open position and are *never* opened or closed when the well is flowing (except in an emergency) to prevent erosion of the valve sealing surfaces. The lower master valve will normally be manually operated, while the upper master valve is often hydraulically actuated, allowing it to be used as a means of remotely shutting in the well in the event of emergency. An actuated wing valve is normally used to shut in the well when flowing, thus preserving the master valves for positive shut off for maintenance purposes. Hydraulic operated wing valves are usually built to be fail safe closed, meaning they require active hydraulic pressure to stay open. This feature means that if control fluid fails the well will automatically shut itself in without operator action.

The right hand valve is often called the flow wing valve or the production wing valve, because it is in the flow path the hydrocarbons take to production facilities (or the path water or gas will take from production to the well in the case of injection wells).

The left hand valve is often called the kill wing valve. It is primarily used for injection of fluids such as corrosion inhibitors or methanol to prevent hydrate formation. It is typically manually operated.

The valve at the top is called the swab valve and lies in the path used for well interventions like wireline and coiled tubing. For such operations, a lubricator is rigged up onto the top of the tree and the wire or coil is lowered through the lubricator, past the swab valve and into the well. This valve is typically manually operated.

ANSI/ API 6A Specification for Wellhead and Christmas Tree Equipment



Key

1 gauge valve
2 bonnet nut
3 blanking plug
4 body
5 top connector
6 swab or crown valve
7 tee
8 wing valve (manual or actuated)
9 choke
10 surface safety valve
11 actuator
12 master valve
13 tubing-head adapter