

ND Bakken Completions	Procedure - Pumping Unit Energy Control	
------------------------------	--	---

EXPLORATION AND PRODUCTION OPERATIONS

Bakken Completions Procedure – Energy Control of Pumping Units

Document Number: BC-CR-P-002	
Revision: 0	Date Issued: 03/06/2012
Reference: New document – no references applicable	
Author: Dr Graham Marshall, EHS&SR Consultant, The Risk Tool Box	
Content Owner: Bobby Rouse , Completions Rigs Supervisor	
Approval Authority: Alfred Tischler, CO Team lead	Signature On File

UNCONTROLLED DOCUMENT VALID ONLY AT TIME OF PRINTING PRINT DATE: SEPTEMBER 15, 2012

ND Bakken Completions	Procedure – Pumping Unit Energy Control	
------------------------------	--	---

Document Control

REVISION HISTORY				
Revision	Description	Date	Prepared by	Approved by
0	New document.	03/06/2012	Graham Marshall	Alf Tischler
1				
2				
3				
4				
5				

RELEASE STATEMENT
Check one box only
<input type="checkbox"/> Unclassified (Shared without Restrictions)
<input checked="" type="checkbox"/> Restricted (Freely Shared within Hess Corporation and Associated Companies)
<input type="checkbox"/> Confidential (Shared With Selected Personnel)
<input type="checkbox"/> Most Confidential (Strict Need-to-Know Basis)

REVIEW STATUS
Check one box only
<input type="checkbox"/> Review Period 1 Year
<input checked="" type="checkbox"/> Review Period 3 Years
<input type="checkbox"/> Review Not Required

PREPARATION
Check one box only
<input checked="" type="checkbox"/> By Hess Corporation
<input type="checkbox"/> For Hess


<p>ND Bakken Completions</p>	<p>Procedure - Pumping Unit Energy Control</p>	
-------------------------------------	---	---

Table of Contents

1.0 INTRODUCTION TO THIS PROCEDURE 4

 1.1 Purpose of this Procedure 4

 1.2 Scope of this Procedure 4

 1.3 Definitions, Abbreviations and Acronyms used in this Procedure 4

 1.4 Referenced Documents 5

 1.5 Accountability for this Procedure 6

 1.6 Filing and Retrieval 6

 1.7 Continual Improvement..... 6

 1.8 Deviations from this Procedure..... 6

2.0 GENERAL EHS REQUIREMENTS 7

 2.1 Applicable Hess Rules..... 7

 2.1.1 Energy Isolation..... 7

 2.1.2 Working at Heights 7

 2.2 Mandatory EHS Controls 7

 2.3 Pre-requisite Equipment and Personnel..... 8

3.0 PROCEDURE FOR ENERGY CONTROL AND LOCK-OUT, TAG-OUT 9

 3.1 Energy Control of Pumping Units 9

APPENDIX A - PROCEDURE AUDIT CHECKLIST 14

<p>ND Bakken Completions</p>	<p>Procedure – Pumping Unit Energy Control</p>	
-------------------------------------	---	---

1.0 INTRODUCTION TO THIS PROCEDURE

1.1 Purpose of this Procedure

This Procedure provides the Hess North Dakota (Bakken) minimum mandatory requirements and prohibitions for controlling and then locking-out and tagging-out two potentially lethal energy sources within pumping-units (“pump-jacks”); these being:

1. Electrical energy that powers the pump-jack; and
2. Kinetic-energy within pump-jack cranks, counterweight and beam arrangement.

The procedure shows the energy control process and the “lock-out, tag-out” (LOTO) process to be followed for controlling both of these energy sources within Pumping Units (PUs).

1.2 Scope of this Procedure

In meeting the requirements specified in the Hess EHS Procedure – *Control of Hazardous Energy* (3.06, 4/2005), this procedure shall apply to all of Hess’ sites in North Dakota (ND) where electrical and kinetic energy within Pumping Units needs to be controlled and locked-out and tagged-out (LOTO) prior to the start of other essential operations (e.g., work-over rig operations).

This Procedure shall be applied by all Hess’ direct employees and any contractor or sub-contractor performing energy control and LOTO on PUs in ND.

If contractors or other third parties who provide the services outlined in this Hess Procedure have their own Procedure that is equivalent to this document, Hess may authorize and approve its use.

1.3 Definitions, Abbreviations and Acronyms used in this Procedure

Shall – indicates a mandatory course of action.

Should – indicates a preferred course of action.

May – indicates a permitted course of action.

A description of the other definitions, abbreviations, and acronyms used in this Procedure are provided in Table 1.

ND Bakken Completions	Procedure - Pumping Unit Energy Control	
-----------------------	---	---

Table 1 – List of Definitions, Abbreviations and Acronyms

Abbreviation or Acronym	Definition
HR	Hess Representative
PUs	Pumping Units
PPE	Personal Protective Equipment
H ₂ S	Hydrogen Sulphide (“Sour gas”)
FR	Fire Retardant
ND	North Dakota
RO	Rig Operator
HOA	Hand-off Automatic (Switch)
LOTO	Lock-out, tag-out
EHS&SR	Environment, Health, Safety and Social Responsibility
CO	Completions Operations

1.4 Referenced Documents

A listing of documents referenced in this Procedure is provided in Table 2.

Table 2 – List of Referenced Documents

Document Name	Document Number
<i>Procedure - Personal Protective Equipment</i>	2.14 (9/1991)
<i>Procedure – Control of Hazardous Energy</i>	3.06 (4/2005)
<i>Procedure – Fire Retardant Clothing</i>	3.15 (4/2005)
<i>Procedure - Incident Reporting</i>	3.24 (3/1992)
<i>Procedure – Hazard Spotting</i>	BC-EHS-P-001
<i>Procedure – Hydrogen Sulphide</i>	2.07 (6/1994)

<p>ND Bakken Completions</p>	<p>Procedure – Pumping Unit Energy Control</p>	
-------------------------------------	---	---

1.5 Accountability for this Procedure

The Bakken (ND) *Completions Operations (CO) Team Lead* shall be accountable for the following matters:

- The content of this Procedure;
- Ensuring compliance with this Procedure; and
- The periodic review and currency of this Procedure.

In order to maintain currency of this Procedure, it shall be reviewed every three years or whenever appreciable changes to Hess' business environment occur (e.g., where new risk management legislative requirements impose a new duty upon Hess Corporation).

1.6 Filing and Retrieval

The official version of this Procedure shall be the updated version stored in the Hess Management System database. A paper copy may be printed out from this.

Prior to the start of energy isolation of PUs on Hess locations, the Hess Representative (HR) shall ensure that the print-out copy of this Procedure that is available on location has the latest revision number(s) and contains the latest updated information.

1.7 Continual Improvement

Any user of this Procedure who encounters a mistake or confusing entry shall immediately notify the Document Content Owner (listed on the cover page).

1.8 Deviations from this Procedure

Deviations from the mandatory requirements of this Procedure shall be permissible only in the most unusual of circumstances.

In such circumstances, a written request to deviate from the mandated requirements of this Procedure shall be submitted to Hess' Bakken (ND) *Completions Operations Team Lead* for due consideration.

Authorization for requests to deviate from the mandatory requirements of this Procedure may be approved (in writing) by Hess' Bakken (ND) *Completions Operations Team Lead* following a review of the implications of adopting an alternative approach.

<p>ND Bakken Completions</p>	<p>Procedure - Pumping Unit Energy Control</p>	
-------------------------------------	---	---

2.0 GENERAL EHS REQUIREMENTS

2.1 Applicable Hess Rules

The following Hess Rules apply to activities undertaken as part of this Procedure.

2.1.1 Energy Isolation

Stored energy sources shall be identified, isolated, tested and communicated to appropriate personnel before work shall proceed.

2.1.2 Working at Heights

Personal fall protection equipment shall be worn when working 4 feet or higher above ground.

2.2 Mandatory EHS Controls

The following mandatory controls shall be required prior to isolating energy sources on Pumping Units on Hess locations in ND.

- No person shall enter the safety cage around the PU until the electricity within the PU and the kinetic energy within the PU are controlled using a method of primary and secondary isolation together with a lock and a written tag;
- In order to provide management guidance and oversight, the Hess Representative shall be present at all times at the specific location of the work described in this Procedure;
- A pre-work evaluation of wind-speed, wind direction, and other weather factors shall be undertaken by the Hess Representative prior to the isolation activity beginning;
- Isolation operations shall not start, or shall cease if weather conditions are not suitable;
- Prior to the isolation activity, the job supervisor shall inform, co-ordinate and communicate with other crews performing SimOps on location;
- The potential for the presence of, and release of Hydrogen Sulphide Gas shall be managed by reference to Hess Procedure - *Hydrogen Sulphide (2.07)* and Guideline BC-EHS-G-004;
- Personal gas detectors with the capability to identify H₂S shall be worn by each worker;
- Required Personal Protective Equipment (PPE) and Fire Retardant (FR) clothing shall be worn (refer to Hess *Procedures 2.14 and 3.15*);
- A Job Safety Analysis shall be undertaken prior to the isolation activity on the PU;


<p>ND Bakken Completions</p>	<p>Procedure – Pumping Unit Energy Control</p>	
-------------------------------------	---	---

- All workers involved in the isolation activity shall monitor the environment for changes using Hess' "Hazard Spotting" process (refer to – Hess *Procedure BC-EHS-P-001*);
- All near-miss incidents or incidents resulting in actual harm shall be reported immediately to the Person in Charge (PIC) (refer to Hess *Procedure - Incident Reporting (3.24)*); and
- All activity shall cease upon the activation of alarms, or if the job becomes unsafe.

2.3 Pre-requisite Equipment and Personnel

The following people, equipment items and/or tools may be expected to be needed to perform the work detailed in this Procedure:

- Hess Representative;
- Rig Operator;
- At least one Rig-hand;
- Two standard scissor-type Hasps (locking device);
- At least three locks with keys (one for electricity lock-out purposes and two for lock-out of the kinetic-energy);
- Safety tags for tag-out purposes;
- Hess "standard" PPE; and
- Personal gas monitors with the capability to monitor for, and alarm in the presence of H₂S gas.

ND Bakken Completions	Procedure - Pumping Unit Energy Control	
-----------------------	---	---

3.0 PROCEDURE FOR ENERGY CONTROL AND LOCK-OUT, TAG-OUT

3.1 Energy Control of Pumping Units

The Procedure for energy control and LOTO on PUs on Hess locations in ND is shown below.

Step	Responsible person	Task description	Additional Guidance
1	Hess Representative	The Hess Representative (HR) shall check and verify that weather conditions are suitable for the Pump Unit (PU) LOTO energy control procedure to begin.	
2	Hess Representative	The HR shall be present for the duration of the LOTO isolation process.	
3	Hess Representative	The HR shall ensure that a pre-job safety meeting with the rig crew involved in the PU isolation is held, and that this <i>Procedure</i> should be reviewed.	The Procedure shall be reviewed whenever a new team member joins the crew.
4	Hess Representative	The HR shall highlight the “Hess Rules” applying to this LOTO <i>Procedure</i> on the PU: <ul style="list-style-type: none"> • Energy Isolation. 	
5	Hess Representative	The HR shall ensure that an existing JSA be reviewed or a new one written prior to the LOTO activity proceeding.	
6	All Hess employees and contractors	No person shall enter to the inside of the safety cage around the PU until all the remaining steps in this <i>Procedure</i> are complete, and confirmed by the HR as being complete.	Comply with Hess Rule for energy isolation.
7	Rig Operator	Isolating the unit begins with a test of the friction brake mechanism on the PU.	

<p>ND Bakken Completions</p>	<p>Procedure – Pumping Unit Energy Control</p>	
-------------------------------------	---	---

Step	Responsible person	Task description	Additional Guidance
8	Rig Operator	If required, remove the brake-handle cover. The steel cover may already be “off” and hanging down on a chain.	The cover is used at step 31 to lock-out the brake-handle.
9	Rig Operator	To test the friction brake, the Rig Operator (RO) shall turn the Hand-off Automatic Switch (HOA) to “off” position and set the brake simultaneously when the counter-weights are at approximately the ten o’clock or two o’clock position.	
10	Rig Operator	The brake lever shall be pulled in a continuous movement to fullest ratchet point.	This establishes the primary braking force on the PU crank.
11	Rig Operator	With the brake applied, the counter-weights shall be held in place – without movement - for the duration of one minute.	This demonstrates that the friction brake is working.
12	Rig Operator	If the test of the friction brake is successful, continue with the rest of this Procedure.	If unsuccessful and the cranks are observed to move, stop and delay the job.
13	Rig Operator	Assuming the test is a success, re-instate the electrical power supply to the unit by turning the HOA switch back to “on” and release the brake simultaneously.	
14	Rig Operator	You are now ready to stop the PU with the cranks at the 12 o’clock position.	
15	Rig Operator	To stop the PU, the RO shall turn the HOA switch back to the “off” position and set the brake simultaneously when the counter-weights are at the top of the rotation – at the 12 o’clock position.	

ND Bakken Completions	Procedure - Pumping Unit Energy Control	
-----------------------	---	---

Step	Responsible person	Task description	Additional Guidance
16	Rig Operator	Walk to the PU Breaker box (Power Control Panel).	
17	Rig Operator	The breaker power handle shall be set to "off" position.	
18	Rig Operator	The RO shall place a Standard Scissor Hasp (locking device) with six-person locking mechanism on the breaker-switch handle locking position.	
19	Rig Operator and Hess Representative	The RO and HR shall each place a personal lock and tag on the Hasp to lock the breaker-switch.	Remove the keys from the locks.
20	Rig Operator	<p>The tags shall show the following information:</p> <ul style="list-style-type: none"> • Name of person placing lock; • Company name and rig number; • Date; and • Contact numbers of person placing lock. 	
21	Rig Operator	Move back to the Hand-off Automatic Switch (HOA).	
22	Rig Operator	The RO shall turn the HOA to "on" position and check for presence of electricity in the PU.	Note – if the PU starts, the electricity is not isolated at the breaker switch.
23	Rig Operator	If the PU does not start, the PU is isolated for electricity and the HOA shall be re-set to the "off" position.	Stop the job and contact the HR if electricity is present.
24	Rig Operator	The RO shall now use the remote Pawl linkage-rod located beside the friction-brake handle to engage the positive-stop pawl on the outside of the brake assembly.	

<p>ND Bakken Completions</p>	<p>Procedure – Pumping Unit Energy Control</p>	
-------------------------------------	---	---

Step	Responsible person	Task description	Additional Guidance
25	Rig-operator	<p>To engage the pawl, it is necessary to remove the bolt from the chain which is holding the pawl in the disengaged (“open”) position.</p> <p>The bolt and chain are approximately ½ way along the linkage-rod.</p>	Remember to reset the bolt once the chain is removed.
26	Rig Operator	With the chain removed from the linkage-rod, pull the handle on the rod downwards and towards you in a steady continuous movement.	The pawl will “flip” over into the “engaged” position.
27	Rig Operator	<p>It is necessary to adjust the pawl in order to ensure it is engaged in the locking groove in the outside of the friction brake housing.</p> <p>To achieve adjustment of the pawl, release (“ease-off”) the friction-brake handle a small amount and slowly allow the pawl to be “locked” into position.</p>	
28	Rig Operator	With the pawl engaged and holding the counterweights, re-pull the friction-brake as hard as possible to the maximum ratchet point.	
29	Hess Representative	The HR shall confirm that the friction brake and pawl are both engaged to confirm that the kinetic energy within the crank and counter-weight is isolated and controlled.	
30	Rig Operator	It is necessary to now apply LOTO to both the friction brake handle and the linkage-rod which has engaged the pawl.	
31	Rig Operator	Start LOTO by placing the steel cover over the friction-brake handle.	The cover should be hanging by a chain next to the handle.

ND Bakken Completions	Procedure - Pumping Unit Energy Control	
-----------------------	---	---

Step	Responsible person	Task description	Additional Guidance
32	Rig Operator	In order to lock-out the brake handle with the steel cap, pull the chain tightly around the friction brake mounting post (attached to the safety fence) and place a scissor-hasps through two appropriate chain links once the chain is at its shortest possible length.	The objective here is to ensure the steel cap cannot be removed from the friction-brake lever handle.
33	Rig Operator and HR	The RO and HR shall each place a personal lock and tag on the Hasp.	Remove the keys from each lock.
34	Rig Operator	<p>The tags shall show the following information:</p> <ul style="list-style-type: none"> • Name of person placing lock; • Company name and rig number; • Date; and • Contact number of person placing lock. 	
35	Rig Operator	The next step is to lock the pawl in the “engaged” position using the appropriate chain on the linkage-rod.	
36	Rig Operator	Extend the chain and align with the “eye” that is welded on top of the linkage-rod.	
37	Rig Operator	Place a scissor-hasps through the chain and “eye”.	
38	Rig Operator and HR	The RO and HR shall each place a personal lock and tag onto the hasp.	
39	Rig Operator and Hess Representative	<p>The tags shall show the following information:</p> <ul style="list-style-type: none"> • Name of person placing lock; • Company name and rig number; • Date; and • Contact number of person placing lock. 	This procedure is now complete. Ensure to perform house-keeping before starting another task.


ND Bakken Completions	Procedure – Pumping Unit Energy Control	
------------------------------	--	---

APPENDIX A - PROCEDURE AUDIT CHECKLIST

Energy Isolation (LOTO) on Pumping Units

Observer name:	Place of observation:	Date:	Time:
-------------------------	--------------------------------	----------------	----------------

No.	Procedural Step	Done safely	Not done	NA	Your Comments?
1	Does the Hess Representative (HR) check and verify that the weather is suitable for energy control and LOTO to occur on the PU?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	Is a pre-job safety meeting held?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Is the Hess <i>PU Energy Control Procedure</i> reviewed during the meeting?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Does the HR highlight the energy isolation Hess Rule?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5	Is a JSA reviewed or a new one written?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6	Does the HR ensure that no person enters the safety cage surrounding the PU until the energy is confirmed as being isolated through LOTO?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7	Does the Rig Operator (RO) test the utility of the friction brake by stopping the PU with the counterweights at the ten o'clock or two o'clock position?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8	Are the weights held in position for at least 1 (one) minute to test the friction brake?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9	Assuming the test is successful, does the RO turn the Hand-off Automatic Switch (HOA) to "off" position and set the brake simultaneously when the counter-weights are in the "up" position at 12 o'clock?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	Is the friction-brake lever pulled in a continuous movement to fullest ratchet point?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
11	Does the RO turn the power handle in the breaker-box to the "off" position?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12	Is a hasp, locks, and tag placed to lock-out the breaker power handle?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

ND Bakken Completions	Procedure - Pumping Unit Energy Control	
------------------------------	--	---

No.	Procedural Step	Done safely	Not done	NA	Your Comments?
13	Does the RO turn the HOA to "on" position and check for presence of electricity in the PU?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14	If no power is identified in the PU, is the HOA turned back to the "off" position and left in that state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15	Does the RO use the remote Pawl locking/unlocking handle to engage the pawl?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16	Does the HR confirm that the friction-brake and mechanical pawl are both engaged?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
17	Is a hasp, locks, and tag placed to lock-out the friction brake handle?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
18	Is a hasp, locks, and tag placed to lock-out the pawl handle?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
19	Is the HR present for the duration of the energy control and LOTO process?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
20	Is house-keeping undertaken on completion of the job?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	