
Venting and Flaring Requirements

Directive PNG036

March 2020

Revision 2.0

Governing Legislation:

Act: *The Oil and Gas Conservation Act*

Regulation: *The Oil and Gas Conservation Regulations, 2012*

Order: 46/20

Record of Change

Revision	Date	Description
0.0	August 1, 2018	Initial draft
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1. Introduction

Directive PNG036: Venting and Flaring Requirements (Directive PNG036) sets out the requirements for venting and flaring from oil and gas operations in Saskatchewan. Some of the operations that contribute to venting and flaring include, but are not limited to drilling, completions, well testing, and production.

The purpose of Directive PNG036 is to manage venting and flaring in a responsible manner to ensure the protection of human health, public safety, property and the environment and to prevent fire or explosion.

Questions on Directive PNG036 can be directed to the Ministry of Energy and Resources (ER) Service Desk at 1-855-219-9373 or ER.servicedesk@gov.sk.ca.

2. Definitions

Associated gas: Gas produced from an oil well.

Conservation: Recovery of associated gas for use as fuel for production facilities, other useful purposes (e.g. power generation), sale or beneficial injection into an oil or gas pool.

Emergency flaring or venting: Emergency flaring or venting occurs when safety controls within the facility are enacted to depressurize equipment to avoid possible injury or property loss resulting from explosion, fire or catastrophic equipment failure. Examples of possible causes include pressure safety valve overpressure and emergency shutdown.

Equipment component: A component of equipment that comes into contact with hydrocarbons and that has the potential to emit fugitive emissions.

Flaring: The combustion of gas in a flare or incinerator.

Non-associated gas: Gas produced from a gas well.

Non-routine flaring or venting: Intermittent and infrequent flaring or venting. There are two types: planned and unplanned.

Planned flaring or venting: Flaring or venting where the operator has control over when and for how long it will occur and also has control over release rates. Planned flaring or venting results from the intentional depressurization (purging) of processing equipment or piping systems. Planned flaring or venting may occur during pipeline blowdowns, equipment depressurization, start-ups, facility turnarounds, and well tests.

Unplanned flaring or venting: Emergency or upset operational activities closely associated with protecting the integrity of the facility and protecting safety. The operator has no control over when these activities will occur. There are two types: upset and emergency.

Upset flaring or venting: Upset flaring or venting occurs when one or more process parameters fall outside the allowable operating or design limits and flaring or venting is required to aid in

bringing the production back under control. Upset flaring or venting may occur due to the production of off-spec product; the formation of hydrates; loss of electrical power; process upset; or operator error.

3. Governing Legislation

The requirements in this Directive are authorized under and supplemented by:

- *The Oil and Gas Conservation Act (OGCA)*
- *The Oil and Gas Conservation Regulations, 2012 (OGCR)*
- *The Oil and Gas Emissions Management Regulations (OGEMR)*

Associated Directives:

- *Directive PNG001: Facility Licence Requirements*
- *Directive PNG017: Measurement Requirements for Oil and Gas Operations*
- *Directive PNG032: Volumetric, Valuation and Infrastructure Reporting*
- *Directive S-01: Saskatchewan Upstream Petroleum Industry Storage Standards*
- *Directive S-20: Saskatchewan Upstream Flaring and Incineration Requirements (Directive S-20)*

4. General

Investigations may occur as part of an ER inspection or may be triggered by public complaint(s) raised regarding venting or flaring at a well or facility. After investigation ER may require the licensee to:

- conduct an air quality investigation;
- install air quality monitoring equipment;
- conduct an air dispersion model;
- attempt to eliminate the air contaminants at their source;
- implement good housekeeping to minimize fugitive emissions;
- implement a reduced venting or flaring limit;
- flare the gas by means of alternate closed-flame combustion equipment;
- conserve the gas;
- shut-in the well or facility; or
- conduct any, or any combination, of the aforementioned requirements.

5. Oil Well and Oil Facility Venting and Flaring Requirements

The following sub-sections apply to associated gas from oil wells and oil facilities.

5.1 Associated Gas Venting Limit

Oil wells and oil facilities that vent and flare a combined volume of gas greater than 900 cubic metres (m³)/day must flare all non-conserved volumes of gas unless the gas is vented to avoid serious risk to human health or safety arising from an emergency situation.

In the course of properly operating equipment according to the manufacturer's instructions, gas may be vented from:

- the seals of a centrifugal compressor or from the rod packings and distance pieces of a reciprocating compressor;
- pneumatic pumps and pneumatic controllers; or
- flashing losses and breathing losses from storage tanks operating at low pressures.

Oil wells and oil facilities licensed before January 1st, 2020 must comply by July 1st, 2020. Oil wells and oil facilities licensed on or after January 1st, 2020 must comply immediately.

5.2 Associated Gas Venting

No person shall vent any volume of gas from a well or facility that:

- contains H₂S in a concentration greater than 10 mol/kmol as measured at the source;
- contains H₂S in a concentration greater than 0.01 mol/kmol as measured at the lease edge;
- causes off-lease odours; or
- causes an exceedance of the Saskatchewan Ambient Air Quality Standards.

5.3 Associated Gas Flaring

Oil wells and oil facilities may flare in excess of 900 m³/day. Flaring activity of any volume must:

- meet the requirements set out in Directive S-20;
- not cause off-lease odours; and
- meet the Saskatchewan Ambient Air Quality Standards.

If flared volumes are greater than 900 m³/day and the flare is within 500 metres (m) of an occupied dwelling, public facility, or urban centre the gas must be conserved. The flare may be permitted if the following is obtained:

- consent from occupant or residence within 500 m; or
- approval from ER.

5.4 Discontinuation of Conservation

Licensees must notify ER prior to discontinuing conservation. If applicable, the licensee must complete a facility licence amendment that reflects the operational changes.

6. Gas Well and Gas Facility Venting and Flaring Requirements

The following sub-sections apply to gas wells and gas facilities.

6.1 Gas Venting

Venting from a gas well or gas facility, including gas plants, is not permitted unless it is an emergency and a reasonable level of precaution has been taken to protect human health, public safety, property and the environment and to prevent fire or explosion.

In the course of properly operating equipment according to the manufacturer's instructions, gas may be vented from:

- the seals of a centrifugal compressor or from the rod packings and distance pieces of a reciprocating compressor;
- pneumatic pumps and pneumatic controllers; or
- flashing losses and breathing losses from storage tanks operating at low pressures.

6.2 Gas Flaring

Flaring at a gas well or gas facility, excluding gas plants, is not permitted unless it is an emergency and a reasonable level of precaution has been taken to protect human health, public safety, property and the environment and to prevent fire or explosion.

Gas plants are approved to flare as per the conditions on the facility licence.

7. Gas Facility Leak Detection and Repair (LDAR) Requirements

For the purpose of limiting leaks from equipment components at applicable facilities, licensees must establish and carry out:

- an LDAR program that satisfies the requirements of Section 7.2; or
- an alternative LDAR program that satisfies the requirements of Section 7.3.

7.1 Applicable Facilities

LDAR surveys must be completed at applicable gas facilities that produce or receive, or are expected to produce or receive, a combined volume of more than 60,000 m³ of gas annually.

Surveys must be completed at least two times per year and at least 90 days after a previous survey. New facilities that report first gas production after July 1st must complete at least one survey that year.

Applicable gas facilities are determined by facility subtype and include the subtypes listed in the table below:

Facility type	Facility subtype codes	Frequency
Multi-Well Gas Batteries	361, 362, 363, 364	Semi-annually
Single-Well Gas Batteries	351	Semi-annually
Sweet Gas Plants	401	Semi-annually
Sour Gas Plants	402, 403, 404, 405	Semi-annually
Straddle and Fractionation Plants	406, 407	Semi-annually
Gas Gathering Systems	621	Semi-annually

7.2 LDAR Program Requirements

Eligible leak detection instruments must be operated and maintained in accordance with the recommendations, if any, of its manufacturer. Licensees must conduct a leak survey on all equipment components using one of the following eligible leak detection instruments:

- a gas-imaging camera that is designed to detect pure methane gas emitted at a rate of 1.0 gram per hour or less under controlled laboratory conditions. When using gas-imaging cameras, the licensee should:
 - be within 1.5 to 3 metres from the equipment being surveyed, depending on the size and accessibility of the equipment, except tank tops; or
 - be at the minimum distance required to view tank-top components.
- an organic vapour analyzer that detects hydrocarbon gases at a concentration of 500 parts per million (ppm) when used in accordance with the United States Environmental Protection Agency's (EPA) Method 21.

Equipment components that are exempt from LDAR are:

- those used on a wellhead at a site where there is no other wellhead or equipment except for gathering pipelines or a meter connected to a wellhead; and
- those that would pose a serious risk to human health or safety by undergoing an inspection.

A person that conducts leak surveys must have proper training and experience in:

- the operation and maintenance of the leak detection instruments;
- leak survey procedures; and
- data collection and reporting.

7.3 Alternative LDAR Program Requirements

An alternative LDAR program must have an equivalent fugitive emissions reduction outcome as the LDAR program in section 7.2.

The alternative LDAR program must address:

- the operation of leak detection instruments (if applicable);
- the inspection of leaks; and
- the repair of leaks detected.

ER must be notified and provided with supporting documents prior to conducting an alternative LDAR program. If ER is not satisfied with the outcomes of the alternative LDAR program, a standard LDAR program may be required.

7.4 Repair

If a leak is detected at a facility during a leak survey, the leak must be repaired:

- within 30 days of detection;
- if the repair requires the facility to be shut down, at the next turnaround for the facility; or
- immediately if the leak contains sour gas or causes off-lease odours.

If repairs are not possible within 30 days, licensees must keep a record of justification for late repair and the repair schedule.

A gas release detected during a leak survey is not considered a leak if it is found in a concentration of less than 500 ppm.

7.5 Records

Records from all surveys must be kept for five years that contain the information outlined in Appendix 1. Once annually the licensee must submit a report containing the results of the LDAR program for all facilities for that year. If an alternative program is used, the licensee must also confirm the effectiveness of the program.

8. Venting of Non-combustible or Inert Gas Mixtures

Releases of inert gases such as nitrogen, carbon dioxide and water vapour from upstream petroleum industry equipment, or produced from wells may not have sufficient heating value to support combustion. These gases may be vented to atmosphere subject to the following requirements:

- the gas does not contain an H₂S concentration greater than 0.01 mol/kmol;
- it does not result in off-lease odours;
- it does not cause an exceedance of the Saskatchewan Ambient Air Quality Standards; and
- it is approved by ER.

Alternatives to venting gas include flaring with sufficient fuel gas to ensure destruction of odorous compounds.

9. Temporary Well Flaring and Venting

Temporary well flaring and venting activities include well testing, well cleanup, and well completions.

9.1 Temporary Flaring

ER recommends licensees evaluate opportunities to use existing gas gathering systems prior to commencing well testing, well cleanup, or well completions. If using existing gas gathering systems is not possible, licensees must flare all gas if combustion can be sustained.

9.2 Temporary Venting

If combustion cannot be sustained, temporary venting is allowed subject to the following conditions:

- the gas does not contain an H₂S concentration greater than 0.01 mol/kmol;
- the gas does not contain free hydrocarbon liquid (if free hydrocarbon liquids are present in the produced gas, a flare and liquid separation must be used);
- it does not result in off-lease odours; and
- it does not cause an exceedance of the Saskatchewan Ambient Air Quality Standards.

10. Non-routine Requirements

Non-routine flaring or venting may be carried out where a reasonable level of precaution has been taken to protect human health, public safety, property and the environment and to prevent fire or explosion.

All non-associated gas must be shut-in during facility outages.

ER requires notification of non-routine flaring or venting events as described in section 11.

10.1 Unplanned Non-routine

Licensees should evaluate and consider options to minimize non-routine flaring or venting during upsets and emergencies at oil and gas facilities.

10.2 Planned Non-routine

Licensees should evaluate and consider the implementation of appropriate measures to reduce associated gas flaring. Measures to be considered include:

- delivering associated gas to a nearby gas plant that is not on turnaround;
- scheduling maintenance at related oil facilities to coincide with the gas plant turnaround;
- communicating with well, battery and gas plant operators to ensure that planned non-routine associated gas flaring and venting are minimized; and
- curtailment of oil production to reduce associated gas production.

10.3 Records

The licensee must maintain a log of flaring and venting events and respond to public complaints in order to comply with reporting requirements. The logs must:

- Include information on complaints related to flaring and venting events and include how these complaints were investigated and addressed;
- Describe each non-routine flaring and venting incident and any changes implemented to prevent future non-routine events of a similar nature from occurring;
- Include the date, time, duration, gas source, H₂S concentration and volumes for each incident; and
- Be kept for a minimum of 12 months.

Flaring and venting records must be made available to ER upon request.

11. Notification Requirements

Licensees must notify ER and occupants of a dwelling, public facility, or urban centre located within 500 m that temporary or non-routine flaring or venting will occur, as detailed in the following sub-sections.

If a new dwelling or public facility is constructed or relocated within 500 m of an existing facility, the licensee must provide information to the new occupants about flaring or venting operations.

11.1 Notification to Public

Notification must be given to occupants of dwellings, public facilities, and urban centres within 500 m:

- 48 hours prior to commencement of planned non-routine flaring and venting events; or

- 48 hours following unplanned non-routine flaring and venting events.

Alternative notification requirements may be agreed upon between licensees and occupants within 500 m.

11.2 Notification to ER

Notifications must be given to ER through the Integrated Resource Information System for all non-routine flaring and venting events that last longer than 4 hours in duration:

- 48 hours prior to commencement of planned non-routine flaring and venting events; or
- 48 hours following unplanned non-routine flaring and venting events.

Appendix 1

Records from all surveys must be kept that contain the following information:

- Facility ID;
- Survey unique identifier (optional);
- Date of survey;
- Name of person conducting the survey;
- Name of third party survey company (if applicable);
- Type of leak detection instrument used;
- Equipment components surveyed;
- Equipment components exempt (if applicable); and
- If a leak is detected:
 - Leak unique identifier (optional);
 - Equipment component leaking;
 - Location of component;
 - H₂S concentration;
 - Leak repaired (yes or no);
 - Date of repair (if applicable);
 - Repair method (if applicable);
 - Leak repair confirmation method (if applicable); and
 - If unable to repair within 30 days, justification and future repair information.
- If no leak is detected:
 - Indicate if a gas release was detected less than 500 ppm.