EUB Alberta Energy and Utilities Board

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Note: Section 3 of this ID was rescinded by Guide 71, effective June 2003. Section 3 has been removed from this file.

INTERIM DIRECTIVE ID 90-1

1 June 1990

To: All Oil and Gas Operators
All Servicing and Drilling Contractors

COMPLETION AND SERVICING OF SOUR WELLS

This directive replaces Informational Letter IL 84-9* and sets out the requirements for completion and/or servicing operations as they apply to sour wells. Sections 1 to 4 set out the procedures and requirements for sour wells. Sections 5 to 8 set out the requirements for approval to conduct completion or servicing operations for critical sour wells.

** This and other documents are identified in Appendix 2.*

Completion or servicing operations on critical sour wells where the wellhead is removed will require the submission of a site-specific application to the Board. The application must be approved by the Board prior to commencement of operations at the well. The Board will also require a brief submission for initial well completion operations on critical sour wells, where the wellhead** is not removed. Details of these submission requirements are outlined in Section 6.

*** This and other terms are defined in Appendix 1.*

This interim directive clarifies the requirements for sour wells with respect to emergency response plans and flaring applications when conducting any completion or servicing operations.

The requirements of this directive are in addition to those set out in the Oil and Gas Conservation Act and Regulations.

Applicants requiring assistance or further information regarding this directive should contact the ~~Drilling and Production Department at 297-8326 or 297-3554.~~

[Original signed by]

N.A. Strom
Vice Chairman

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1 SOUR WELLS

1.1 Introduction

The Board requires companies conducting completion or servicing operations to evaluate all wells with respect to their potential for H_2S release, prior to commencement of operations. Should this review indicate that the well falls into the classification of a "critical" sour well, an application to the Board prior to conducting certain operations may be required. Critical sour well completion or servicing operations involving the removal of the wellhead will not be permitted without prior consent of the Board. Well maintenance operations (where the wellhead is not removed) at critical sour wells do not require prior Board approval. Non-critical sour wells may be completed and serviced without prior consent of the Board; however, emergency response plans and flaring approvals may be required for non-critical sour wells as outlined in subsequent sections of this directive.

1.2 Requirements - Sour Wells

The present requirements for all sour wells are set out in the Oil and Gas Conservation Act and Regulations and various Board publications. Currently these requirements are set out in the following:

1. Interim Directive ID 87-2
2. Interim Directive ID-OG 76-2
3. Informational Letter IL 87-8
4. Informational Letter IL 88-14
5. General Bulletin GB 88-4
6. Section 6.020 of the Regulations
7. Section 6.100, subsection (d) of the Regulations
8. Section 7.050 of the Regulations
9. Section 7.060 of the Regulations
10. Section 8.144, subsection (1)(b) and (1)(c) of the Regulations
11. Section 8.148, subsections (4) and (5) of the Regulations
12. Section 15.240 of the Regulations

Additional requirements for critical sour wells are outlined in Sections 5 to 8 of this interim directive.

2 POTENTIAL H_2S RELEASE RATE DETERMINATION

2.1 Introduction

A determination of the maximum potential H_2S release rate forms the basis for further application requirements. It must be calculated from the maximum surface deliverability of the well and the maximum H_2S content that can be reasonably expected. Evaluations should be done based upon a realistic geological-engineering assessment.

Information used for new well completions should reflect all data gained during the drilling phase of the well, including where necessary data from offsetting wells proven to be representative of the subject well. It is emphasized that a geological analysis of the well logs is very important to this process. Information required for servicing/workover operations should also reflect the latest data available from production records.

In some cases a range of release rates is acceptable - particularly when dealing with pre- and post-stimulation scenarios.

2.2 Completion/Servicing H_2S Release Rates

The completion/servicing H_2S release rate is used to determine the emergency planning zone and the consequences of any release of H_2S.

Information required includes:

(1) For each formation to be completed or producing which contains H_2S,

> (a) the maximum concentration of H_2S that can be expected and the source of that information,
>
> (b) the maximum potential H_2S release rate which shall be calculated using the maximum wellhead natural gas deliverability that can be obtained at any time through the casing against zero wellhead pressure (unless other flow configurations result in a higher release rate), and shall be expressed in the units m^3/s at standard conditions. In the case of oil wells consideration must be given to the potential release rate from the gas cap in addition to the release rate due to the solution gas.

(2) The maximum potential uncontrolled surface H_2S release rate at that stage in the operations where the sum of the release rates from each formation open in the wellbore is at a maximum.

[Section 3 of this Interim Directive has been rescinded by Guide 71, June 2003]

4 FLARING APPROVAL REQUIREMENTS*

** These requirements are presently under review by the ERCB's Environment Protection Department.*

4.1 Introduction

When sour gas at a critical sour well or a well containing more than 10 moles per kilomole of H_2S (1.0 per cent) is required to be flared, during any test, during any period of cleaning out the well, or during well servicing operations, prior approval must be obtained. This approval is obtained by application to the Board's Environment Protection Department. A copy of the approval must be on lease prior to flaring of sour gas at the well site.

4.2 Application Requirements

The application requirements are specified in section 15.240 of the Oil and Gas Conservation Act and Regulations. An application presently shall include

(1) the dimensions of the proposed flare stack (height and diameter),

(2) a map showing the location of the well, topography of the area, limits of cities, towns or villages, residences and recreational areas within a 3-kilometre radius of the well site,

(3) the maximum rate at which the well will be flowed,

(4) the total volume of gas to flared,

(5) an analysis on a condensate-free basis of the gas from the well or, if a gas sample from the well is not available, an analysis of the gas from the same pool,

(6) the anticipated rate of liquid production, and

(7) a description of the method of handling the liquid production from the well.

5 CRITICAL SOUR WELL CRITERIA

5.1 Introduction

The classification of critical sour wells is based on two primary criteria, H_2S release rate potential and the wells' proximity to urban centres.

A critical sour well includes

(1) any well from which the maximum potential H_2S release rate is 0.01 m^3/s or greater and less than 0.1 m^3/s and which is located within 500 m of the corporate boundaries of an urban centre, or

(2) any well from which the maximum potential H_2S release rate is 0.1 m^3/s or greater and less than 0.3 m^3/s and which is located within 1.5 km of the corporate boundaries of an urban centre, or

(3) any well from which the maximum potential H_2S release rate is 0.3 m^3/s or greater and less than 2.0 m^3/s and which is located within 5.0 km of the corporate boundaries of an urban centre, or

(4) any well from which the maximum potential H_2S release rate is 2.0 m^3/s or greater, or

(5) any other well which the Board classifies as a critical sour well having regard to the maximum potential H_2S release rate, the population density, the environment, the sensitivity of the area. where the well is located, and the expected complexities during the completion or servicing operation.

5. 2 Reclassification

Once a well has been classified as a critical sour well, it will retain that classification, and as such must meet all of the related operational and safety-related requirements set out in this directive.

However, in instances where expected productivity or concentration of H_2S was not realized, as a result of reservoir depletion or any other factors that resulted in a reduction in the maximum H_2S release rate at the well, the Board will consider applications to remove the "critical" designation. Applications to reclassify the well to a "non-critical" designation shall be based on the most recent and complete information available.

6 CRITICAL SOUR WELL COMPLETION AND SERVICING APPLICATIONS

6.1 Introduction

The requirements of this directive are based upon present regulations and the recommendations of the Blowout Prevention Well Servicing Committee (BPWSC). The BPWSC was formed as a result of recommendations by the Blowout Prevention Review Committee (BPRC), established to review drilling-related practices and procedures after the Lodgepole Inquiry. The BPWSC was to

(1) review completion and servicing practices for critical sour wells,

(2) develop Alberta Recommended Practices (ARPs) for completion and servicing operations, and

(3) formulate recommendations with respect to regulatory changes where required.

The BPWSC-developed ARPs provide advice to operators about the completion and servicing of critical sour wells. These ARPs are available through the auspices of the Petroleum Industry

Training Service (P.I.T.S.). The Board maintains the view that "... although strict legal enforcement of good practices is not desired or practical ... (the) ... practices place considerable onus on the legally responsible party to comply or otherwise provide a technically equivalent or better solution."

The Board recognizes that the requirements in Section 7 to some extent overlap the procedures and equipment outlined in the ARPs and as such reduces the flexibility that may have otherwise existed in the ARPs. However, for the items listed in the following section the Board considers it necessary to formally regulate these areas rather than leave it entirely to the operator's discretion to follow the ARPs or utilize equivalent or better procedures and equipment. In doing so the Board has not completely removed the operator's flexibility in approaching a completion or servicing operation in a manner that reflects that company's particular operating philosophy. The Board is still prepared to look at an operator's approach to meeting these requirements and to consider exemptions or waivers from some of these requirements. The Board will, however, expect that the proposed procedures and equipment are equivalent or better than those specified in these requirements. The waiver requests will also be reviewed in the context of the consequences of the waiver in relation to the overall plan of operations, the sensitivity of the area in which the well is located, and any other waivers requested.

6.2 Applications

The Board requires companies to submit, in duplicate, their proposed program for completion or servicing operations without the wellhead on, to the Board's Drilling and Production Department for review and approval. Operations of this nature at critical sour wells will not be permitted without prior consent of the Board.

Board approval to conduct servicing operations which do not require the removal of the wellhead is not required. However, the submission of all wellhead details and a final completion schematic is required prior to conducting the initial completion operations at the well.

6.3 Pre-application Submission

The Board does not require a pre-application submission for completion or servicing operations on critical sour wells. However, the Board encourages pre-application meetings or draft submissions (for unusual operations) where a more efficient approval process may be facilitated. Meetings or draft submissions are recommended for operators who are unfamiliar with the approval requirements or process.

6.4 Application Requirements

6.4.1 Wellhead Off - Completion and Servicing Operations

Applications to conduct operations, with the wellhead off, at a critical sour well shall contain

(1) the potential H_2S release rate information described in Section 2;

(2) a statement of the size (generally the radius) of the emergency response planning zone determined by using the H_2S release rate as determined in accordance with Section 2.2 and Figures 3-1 or 3-1A of this directive.

(3) a statement describing any public awareness program intended or undertaken, addressing in particular the nature and extent of communications with any urban centres or residents in the vicinity of the well;

(4) a statement as to whether or not the well is covered by an existing sour gas facility emergency response plan; or

(5) supplemental information if the well is to be covered by an existing sour gas facility emergency response plan; or

(6) a site-specific emergency response plan as described in Section 3;

(7) any applied-for waivers as; described in Section 3.4;

(8) a flaring application as described in Section 4;

(9) a critical sour well completion and servicing plan as described in Section 7.

This application must be approved by the Board prior to commencement of operations at the well.

6.4.2 Wellhead On - Servicing Operations

Servicing operations conducted, with the wellhead installed, on a critical sour well do not require the submission of any data or Board approval. This is provided the requirements for an emergency-response plan as outlined in Section 3 and when applicable, for a flaring application as described in Section 4, have been met.

6.4.3 Wellhead On - Initial Completion Operations

Where the initial perforation/completion operation will be conducted with the wellhead on, the following data must be submitted:

(1) all requirements (1-7) as outlined in section 6.4.1, and

(2) all wellhead details, and

(3) a final downhole completion schematic.

Board approval is not required for the completion operations; however, Board approval is required for the emergency response plan as outlined in Section 3 and, when applicable, for a flaring application as described in Section 4.

7 CRITICAL SOUR WELLS

7.1 Introduction

The requirements listed in this section apply to the completion or servicing of a critical sour well where the wellhead has been removed or for those operations for which the Board has directed that these requirements shall apply.

7.2 Critical Sour Well Requirements - General

The completion and servicing plan for a critical sour well must be submitted in duplicate. The amount of detail provided should have regard for the type of well, the complexity of the program, and the risk and consequences of a blowout. The plan must provide information and details respecting equipment and procedures proposed, including but not limited to

(1) the purpose of the operations to be conducted, including a general summary of procedures to be followed;

(2) geological information acquired through drilling, testing, completion, or production of the well including a description of the actual or expected characteristics of the formation(s) to be tested, completed, suspended, or abandoned;

(3) details of the existing and proposed wellbore configuration including the dimensions and performance properties of casing, tubing, wellhead, and downhole equipment where applicable (include diagrams);

(4) a general description of the equipment that will be used during the completion or servicing operations at the well, including

(a) the service rig blowout prevention (BOP) system, including shear rams;

(b) the tubing strings being used including both working and production strings;

(c) a summary of the auxiliary services, if applicable;

(d) a summary of the completion fluid, circulating system, and equipment (type, density, quantity, hole volume, surface volume, stockpile supplies and availability, H_2S scavenger, mixing and pumping equipment);

(e) BOP shop servicing and material qualification testing information;

(5) a general description of the procedures that will be followed during completion or servicing operations at the well, including

(a) the inspection and testing procedures to ensure all equipment is fully operational prior to conducting the operation, and procedures to ensure that a state of blowout prevention readiness is maintained;

(b) the procedures to be used to kill the well and maintain well control prior to and during the operation;

(c) the procedures to be used to conduct stimulations or treatments;

(d) the procedures to be used to ensure well-site personnel are familiar with the following:

(i) completion and servicing plan,

(ii) emergency response plans,

(iii) well control procedures,

(iv) BOP drills,

(v) use of equipment on site;

(6) a description of the monitoring program that will be implemented to ensure operational parameters are not exceeded;

(7) confirmation, prior to approval, that the required well-site personnel will be available and adequately trained and experienced in the operations.

7.3 Critical Sour Well Requirements - Specific

7.3.1 BOP Stack and Manifold

(1) Minimum stack components shall conform to the BOP stack configuration as shown in Figure 7-1 or 7-1A. Should shear rams not be required in accordance with Section 7.3.1(3), then a Class III BOP stack (Figure 7-2) may be used.

(2) Minimum manifold design shall conform to a Class III (Figure 7-2) Manifold. The service rig pump manifold shall not be used as the well control manifold.

(3) Shear rams are required unless the operator can demonstrate that the "well complexity" and "consequence risk level" analysis indicate that the rams are not necessary.

(4) All metallic BOP components which may be exposed to sour effluent must be certified as being manufactured from materials meeting the requirements of NACE MR-0l-75.

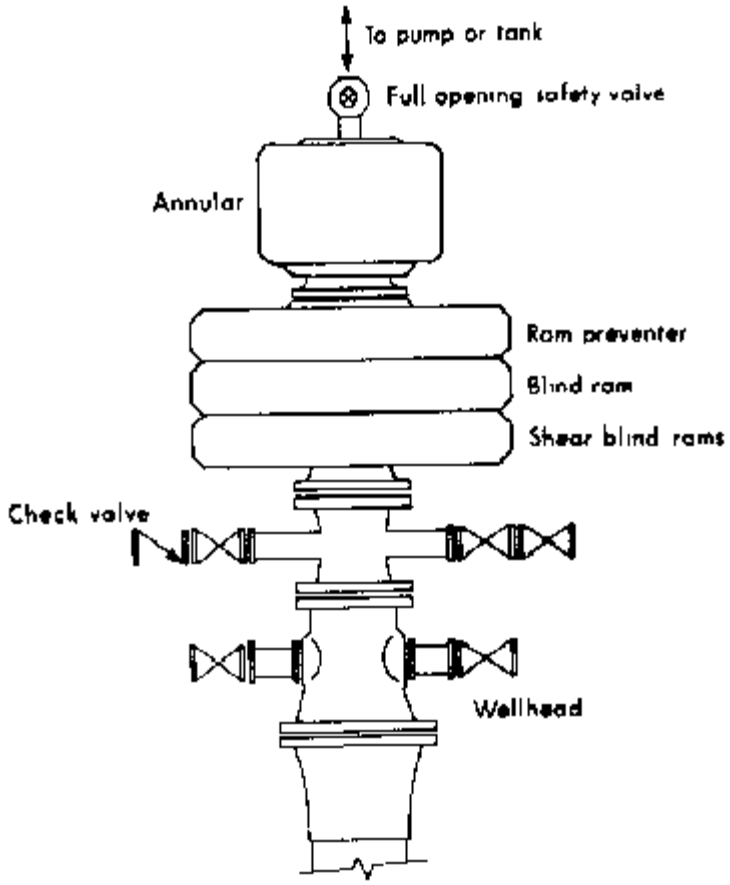
(5) Full function BOP master controls must be located at the accumulator.

(6) The accumulator system shall be sized in accordance with ERCB regulations. Where a shear ram is used (Figure 7-1), the accumulator shall be sized either to operate the BOPs as per ERCB regulations or to shear the completion string without recharge, whichever is the greater volume. Where the shear/blind ram, replaces the blind ram (Figure 7-1A) BOP, the accumulator must function the BOPs as outlined in the ERCB regulations and must be sized to provide sufficient fluid to shear the completion string without recharge.

(7) When a shear ram is employed in accordance with Figure 7-1, the control should be solely at the accumulator panel to avoid accidental shear ram closure. If the shear ram replaces the blind ram, the Driller's panel must operate the ram.

(8) The nitrogen supply or the system back-up must be capable of closing all BOPs, including the shear/blind ram, and shearing the pipe.

(9) The tubing safety valve (stabbing valve) shall be a NACE full opening valve with the proper threads to mate to the completion string thread in use. The valve must have a pressure rating equal to or greater than the BOP pressure rating. Companies have until 1 June 1991 to ensure compliance.

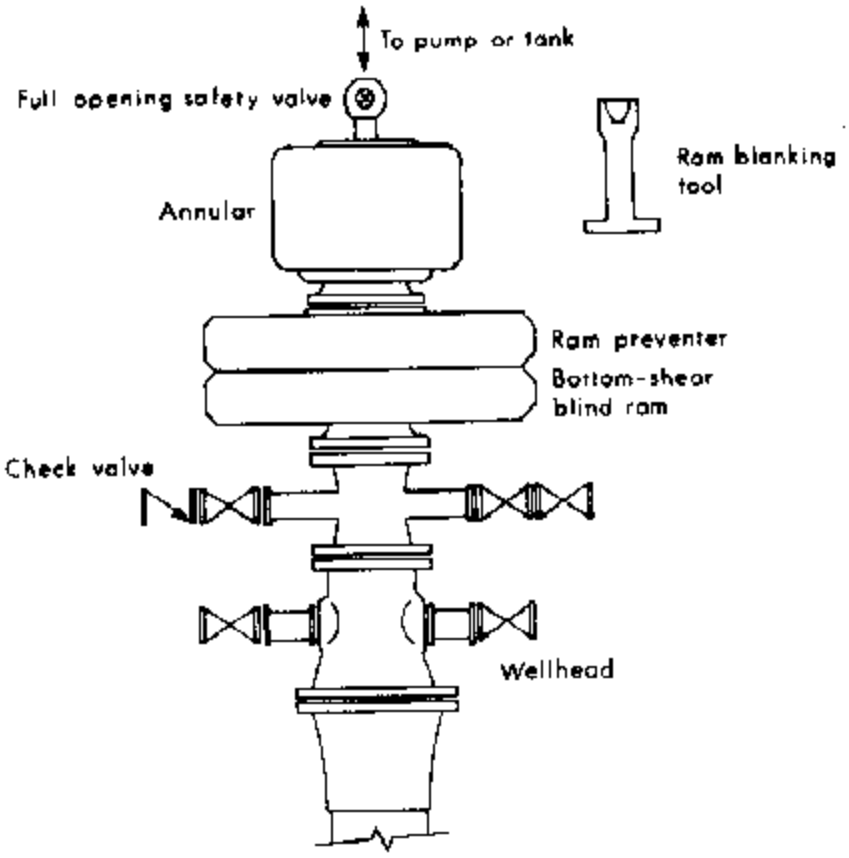


1. All connections must be flanged

2. All pressure containing equipment must be NACE trim

Refer to Schedule 8 of the Oil and GasConservation Regulations for clarification of the symbols used.

Figure 7-1 CRITICAL SOUR WELL SERVICING
BOP STACK WITH SHEAR BLIND RAM



1. All connections must be flanged

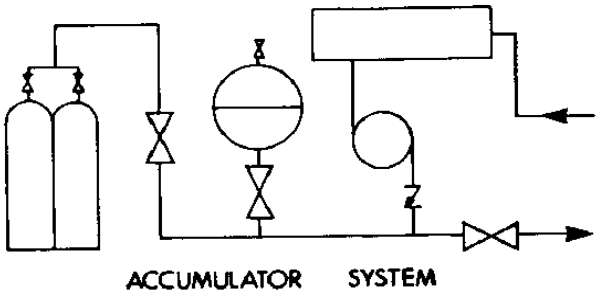
2. All pressure containing equipment must be NACE trim

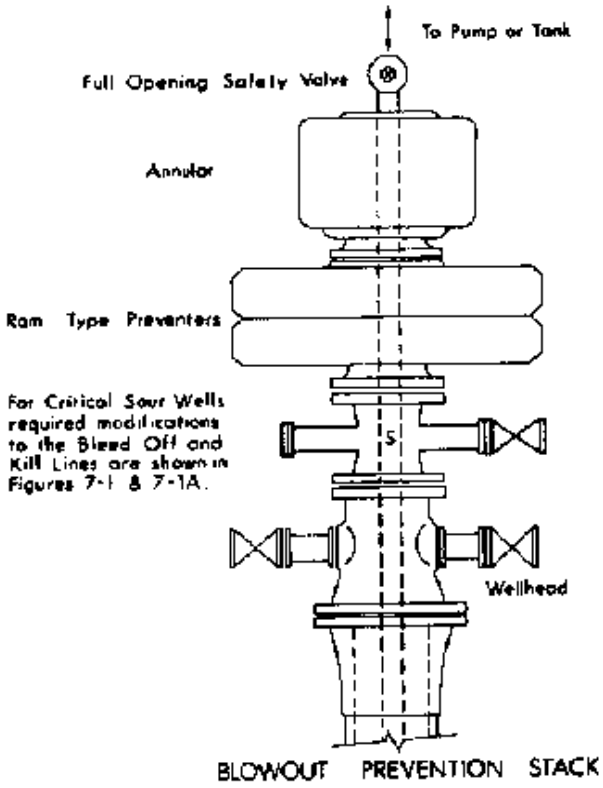
Refer to Schedule 8 of the Oil and GasConservation Regulations for clarification of the symbols used.

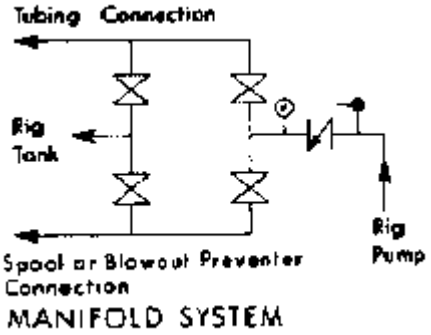
Figure 7-1A CRITICAL SOUR WELL SERVICING
BOP STACK WITH SHEAR BLIND RAM OPTIONAL ARRANGEMENT

Figure 7-2 SERVICING BLOWOUT PREVENTION SYSTEMS - CLASS III

1 RATING OF PRODUCTION CASING FLANGE IS GREATER THAN 21 000 kPa, OR *
2 RATING OF PRODUCTION CASING FLANGE IS LESS THAN OR EQUAL TO 21 000 kPA and H_2S CONTENT OF THE GAS IS EQUAL TO OR GREATER THAN 10 moles/kilomole *







NOTE:

1. Pressure rating of preventers is equal to or greater than the production casing flange rating, or the formation pressure, whichever is the lesser.
2. 50mm lines throughout
3. The positioning of the tubing and blind rams may be interchanged.*
4. Spool may have threaded side outlet (and valve) if wellhead has threaded fittings.*
5. A flanged blowout preventer port (and valve) below the lowest set of rams may replace spool (valve may be threaded if wellhead has threaded fittings).*

* NOT APPLICABLE ON CRITICAL SOUR WELLS

Referred to on page R229 of the SERVICE RIG INSPECTION MANUAL, GUIDE G-37

7.3.2 Rig Inspections

(1) A detailed inspection and BOP drill shall be conducted

(a) prior to starting operations and weekly thereafter, and

(b) prior to starting operations in the critical zone.

(2) Detailed rig inspections shall be performed by the operator and contractor. An inspection check sheet shall be used and retained.

The Board field office staff must be notified prior to these inspections and drills being initiated, so that staff may witness these activities.

7.3.3 Downhole Equipment

Existing critical sour wells not meeting the following requirements have until the next well workover to comply, unless otherwise directed by the Board.

(1) All new critical sour wells, other than wells on artificial lift, must be completed with an annular pack-off device (ie. packer).

(2) A surface controlled subsurface safety valve (SCSSV) must be installed on all flowing critical sour producing wells. Alternatives to an SCSSV will be considered, where significant operating problems may occur and/or evidence can be shown that the alternatives are equal to or technically superior to the SCSSV.

(3) Landing nipples shall be set as close to the producing interval as possible and when applicable below the lowermost gas-lift valve.

7.3.4 Auxiliary Services

(1) Well pressure containing equipment for auxiliary services (BOP/lubricators) must be suitable for sour service.

(2) All wireline or slickline cable must be suitable for sour service.

7.3.5 Wellhead

(1) For new critical sour wells, all wellhead and Christmas tree components shall be manufactured in compliance with API Specification 6A, latest edition (currently sixteenth Edition, 1st October 1989) and all current supplements, and shall bear the API monogram. The four primary components (ie. tubing head, tubing head adapter, lower master valve, and tubing hanger) of critical sour wellheads must meet API Specification 6A. These four components, as a minimum, must comply to Product Specification Level three (PSL III) as defined by API 6A.

Secondary components, as a minimum, must comply to Product Specification Level two (PSL II) requirements.

(2) For new critical sour wells, materials for all wellhead components will conform to NACE standard MR-01-75, latest edition (1984 Revision).

(3) For new critical sour wells, the tubing head spool (above secondary seal) tubing hanger and Christmas tree assembly working pressure ratings as defined by API 6A shall be equal to or greater than the bottomhole pressure of the producing formation.

(4) For new critical sour wells, the wellhead and Christmas tree assembly and other wellhead service equipment should not be exposed to operating pressures greater than their API maximum working pressure rating (MWPR).

(5) For all critical sour wells, a minimum of two master valves are required.

(6) All new critical sour wells, on production and capable of flow to atmosphere, including pumping wells, must be provided with a surface safety valve (SSV). The SSV shall have an API MWPR equal to or greater than the bottomhole pressure of the producing formation. Existing critical wells not meeting this requirement have until 1 June 1991 to comply.

(7) For all new critical sour wells on rod pump an environmental BOP on top of the stuffing box is required. Existing critical sour wells not meeting this requirement have until 1 June 1995 or the next workover, whichever comes first, to comply.

(8) All wellheads must be clearly marked and visible in all seasons.

(9) Physical barriers that are clearly visible must be constructed around wellheads of critical sour wells to prevent accidental vehicle damage. These barriers should be readily removable to accommodate servicing operations. Existing critical wells not meeting this requirement have until 1 June 1991 to comply.

7.3.6 Personnel

Supervision

(1) The Licensee's/Operator's on-site supervisors must have a current P.I.T.S. Well Service Blowout Prevention Certificate, H_2S Alive Training, and appropriate experience in completion/servicing operations on sour wells.

(2) Sufficient supervision must be on site to ensure that no individual supervisor is required to work a shift longer than 12 hours.

Rig Crew

(3) On-site rig managers and drillers must have a current P.I.T.S. Well Service Blowout Prevention Certificate, H_2S Alive Training, and experience in completion/servicing operations on sour wells.

(4) All crew members shall be trained in H_2S safety.

Service personnel

(5) On-site supervisory personnel shall have previous experience in completion/servicing operations on sour wells.

(6) All well-site personnel shall be trained in H_2S safety.

8 SUSPENSION OF CRITICAL SOUR WELLS

8.1 Introduction

The Board requires companies to suspend critical sour wells in such a way as to minimize the possibility of an H_2S release. This section addresses suspension methods the Board has deemed acceptable for both new and old critical sour wells. The Board believes that these methods will preserve wellbore integrity and maintain downhole equipment, tubular goods, and wellhead equipment in a safe condition to permit the safe re-entry of a suspended critical sour well.

8.2 Suspension Requirements

8.2.1 Downhole

(1) All critical sour wells that have been completed and are not scheduled to be produced within 6 months (seasonal producers need not be suspended between seasonal production periods even though the shut-in period exceeds 6 months) must be suspended, depending on the downhole configuration, as follows:

> (a) A bridge plug must set above and within 15 m of the perforations (unless otherwise approved by the Board), pressure tested to a minimum of 7000 kPa for 15 minutes, and capped with 8 lineal metres of cement; or
>
> (b) For wells with packer and tubing, a tubing plug can be installed in a landing nipple located close to the perforated interval below the sour service packer. For gas lift wells the tubing plug must be set below the lowermost gas lift valve. The tubing plug must be pressure tested to a minimum of 7000 kPa for 15 minutes.
>
> (c) The wellbore must be displaced to inhibited fluid.

8.2.2 Surface

(1) Critical sour wells require a minimum form of wellhead installed depending on the well status:

(a) All suspended critical sour wells, whether the formation is open to the wellbore or not, must be equipped with a sour service wellhead/Christmas tree of an API MWPR equal to or greater than formation pressure. The primary and secondary seals which seal around the production casing must have been activated and tested to at least 1.1 times the maximum anticipated shut-in tubing head pressure (SITHP). The pressure test must not exceed collapse resistance of the casing.

Wellhead/Christmas tree assemblies for suspended wells are to be equipped with a companion flange and closed needle valve combination or blind flange, of a working pressure rating equal to the wellhead/Christmas tree components, on all flanges and/or studded spool outlets. Two flanged master valves are required unless the formation is isolated downhole, ie. not perforated or with a bridge plug installed.

(b) A capping assembly can be used as a temporary wellhead for newly drilled non-perforated wells awaiting completion. However, the equipment must still be sour service, of an API MWPR equal to or greater than the formation pressure and equipped with secondary seals which must be activated and pressure tested upon installation.

8.2.3 Security

(1) Critical sour wells must be left in a secure state, as follows:

(a) All wellhead valves must be chained and locked.

(b) All wellheads must be clearly marked and visible in all seasons.

(c) Physical barriers that are clearly visible must be constructed around wellheads to prevent accidental vehicular damage.

APPENDIX 1 DEFINITIONS

For the purpose of this directive:

(1) Auxiliary Services - include the following services:

(a) wireline operations
(b) slickline operations
(c) snubbing operations
(d) endless tubing operations

(2) Completion/Servicing Stage - includes all operations which are continuously attended subsequent to the drilling stage and which are necessary to prepare the well to produce or, after a period of production, to restore the well or to repair the well.

(3) Critical Sour Well - a designation that reflects the well's proximity to an urban centre and its maximum potential H_2S release rate.

(4) Drilling Mode - when a service rig is conducting operations similar to a drilling rig, such as deepening and drilling out cement plugs.

(5) Emergency Planning Zone - an area surrounding the well where residents or other members of the public would be at risk in the event of an uncontrolled release of H_2S. Its size is generally determined using Figures 3-1 or 3-1A as guidelines.

(6) Flow Configuration - the well equipment and flow configurations to be considered in determining the H2S release rate at various stages of a well's drilling or producing life. These are:

(a) casing flow or open-hole flow where reservoir fluids are free to flow up the casing or open hole without any other tubular goods in the wellbore,

(b) tubing and annular flow - where reservoir fluids flow up the tubing and the annular space between the tubular string and the casing or open hole, and

(c) tubing flow - where flow is only up the tubing.

(7) Potential H_2S Release Rate - the calculated H_2S deliverability that can be obtained at surface against zero back pressure with various flow configurations, expressed using units of m^3/s at standard temperature and pressure conditions.

(8) Public Facility* - a public building such as a hospital, rural school, or a major recreational facility situated outside of an urban centre; and for the purpose of this directive includes other developments that the Board, after consultation with the appropriate interested parties, may designate as a public facility based on the complexity of evacuation, taking into account the number of people using the facility and the frequency and duration of their use.

** (Examples of facilities that would normally either be classified as public facilities or that would fail to meet the requirements for designation as public facilities and the reasons for the classification are shown in Table A-1 on page A1-4. These examples are intended to provide a general guide as to the criteria that would be used in determining whether or not a specific facility should be classified as a public facility; however, specific situations should be reviewed with the Board's Environment Protection Department.)*

(9) Sour Gas - natural gas, including solution gas containing H_2S.

(10) Standard Conditions - defined as 101.325 kPa and 15 C (14.73 psia and 60 F).

(11) Surface Improvement - means a railway, pipeline, or any other right of way, road allowance, surveyed roadway, dwelling, industrial plant, aircraft runway or taxiway, buildings used for military purposes, permanent farm buildings, school, or church.

(12) Suspended/Producing Stage includes all operations which are not continuously attended, at wells that may or may not be capable of producing.

(13) Urban Centre - a city, town, new town, village, summer village, or hamlet with not less than 50 separate buildings, each of which must be an occupied dwelling or other incorporated centre; and for the purpose of this directive includes any similar development the Board may designate as an urban centre.

(14) Unrestricted Country Development - any collection of permanent dwellings situated outside of an urban centre and having more than eight permanent dwellings per quarter section; and for the purpose of this directive includes any similar development the Board may designate as an unrestricted country development.

(15) Wellhead/Christmas Tree - includes all components above the tubing head; and for the purpose of this directive both terms are interchangeable with each other.

TABLE A-1 **EXAMPLES OF PUBLIC FACILITIES**

Facilities that would be classified as Public per ID 90-1	**Facilities that would *not* be classified as Public per ID 90-1**

• any rural school
• any rural hospital
• a a major campground
  o defined sites (approximately 20 or more)
  o year round use
	• a rural community hall
	• an auction mart
	• a rural place of business
	  o a welding shop
	  o an auto wrecker
	  o a feed or fertilizer business
	  o a rural general store
	• a limited use campground
	• a day use picnic area

Reasons for Classification	**Reasons for Non-classification**

• a rural school
  o young children
  o problem of evacuation
  o length of attendance at facility
• a rural hospital
  o complexity of evacuation
  o number of people
  o individuals unable to move themselves
• a major campground
  o variety of people (children and adults)
  o number of people
  o complexity of contact and evacuation
  o no way to monitor number of individuals present at any time.
	• a rural community hall
	  o limited use
	  o evacuation could be accomplished easily
	  o easy access to vehicles to evacuate
	  o short duration attendance
	• an auction mart
	  o as above
	• a rural place of business
	  o as above
	• a limited use campground
	  o low numbers to ease evacuation concerns
	• a day use picnic area
	  o limited numbers
	  o short duration

APPENDIX 2 REFERENCES

(1) Interim Directive ID 87-2

SOUR WELL LICENSING AND DRILLING REQUIREMENTS issued on 3 June 1987 with amendments of 13 and 30 June 1988

(2) Informational Letter IL 84-9

COMPLETION AND SERVICING OF SOUR WELLS issued on 7 August 1984

(3) Draft Interim Directive ID 84-

BLOWOUT PROTECTION AT SOUR WELLS issued on 27 April 1984 as Appendix 5 of the report, Lodgepole Blowout Inquiry - Phase 2, Decision D 84-5

(4) Decision D 84-5

LODGEPOLE BLOWOUT INQUIRY - PHASE 2 April 1984, ERCB Calgary.

(5) Decision D 84-9

LODGEPOLE BLOWOUT INQUIRY PANEL December 1984, ERCB Calgary.

(6) Interim Directive ID 81-3

MINIMUM DISTANCE REQUIREMENTS SEPARATING NEW SOUR GAS FACILITIES FROM RESIDENTIAL AND OTHER DEVELOPMENTS issued on 16 December 1981.

(7) Interim Directive ID-OG 76-2

EMERGENCY PROCEDURE PLANS FOR SOUR GAS FACILITIES issued on 14 October 1976.

(8) Informational Letter IL 87-8

EMERGENCY RESPONSE PLANS FOR SOUR GAS FACILITIES issued on 16 July 1987

(9) Informational Letter IL 88-14

EVACUATION AND IGNITION FOR SOUR WELLS issued on 24 August 1988

(10) ALBERTA RECOMMENDED PRACTICES, Volume 2 Completing and Servicing, April 1989, Calgary, Alberta.

(11) NACE, Sulphide Stress Cracking Resistant Metallic Materials for Oil field Equipment, 1984 Editorial Revision MR-01-75, Houston, Texas.

(12) API, Specifications for Wellhead and Christmas Tree Equipment, Sixteenth Edition, October 1989. Spec 6A, Dallas, Texas.

(13) API, Recommended Practice for Care and Use of Casing and Tubing, Fourteenth Edition, May 1986 RP 5C1 Dallas, Texas.

(14) API, Bulletin on Thread Compounds, Fifth Edition, April 1972 Bul 5A2, Dallas, Texas.

(15) API, Recommended Practice for Field Inspection of New Casing, Tubing, and Plain End Drill Pipe, Second Edition, May 1986 API RP 5AR, Dallas, Texas.

(16) API, Specification for Line Pipe, Thirty-Fifth Edition, May 1985 API Spec 5L, Dallas, Texas.

(17) ASTM, American Society for Testing and Materials, 1986 Edition, Philadelphia, Pennsylvania.

(18) CSA, Canadian Standards Association Steel Line Pipe, Second Edition, March 1986, CAN3 - Z245.1 - M86, Toronto, Ontario.

(19) API, Specification for Casing, Tubing, and Drill Pipe, Thirty-Eighth Edition, May 1985 API Spec 5A, Dallas, Texas.

(20) ERCB, Service Rig Inspection Manual, Guide G-37, September 1988, Calgary, Alberta.