



# Safety regulatory regime for industrial gas-fired appliances and installations in Western Australia

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## 1 Scope

This guideline provides an outline of the Western Australian (WA) legislative and procedural requirements for the gas installation aspects of projects that include or consist of large commercial/industrial gas appliances (Type B gas appliances).

The guidelines cover gas installations, which commence downstream of a pipeline licensed under the *Petroleum Pipelines Act 1969* or at a demarcation point (meter, pressure reducing station valve, flange or such) where a pipeline (covered by a pipeline licence) enters the gas installation site. The demarcation point between the requirements of the *Petroleum Pipelines Act 1969* and the *Gas Standards Act 1972* will be determined between the Department of Mines and Petroleum and Energy Safety WA.

The guidelines also cover gas installations from the consumer's billing master meter or the primary regulator in the case of a pressurised container that form part of a Major Hazard Facility.

The legislation covering the installation, servicing and safe operation of gas appliances in WA is the *Gas Standards Act 1972* (Act) and the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999 (Regulations). The legislation relevant to the accuracy of a master meter is the Gas Standards (Gas Supply and System Safety) Regulations 2000.

The guidelines include the following:

- definition of terms used in the gas industry;
- what constitutes a consumer's gas installation;
- types of industrial gas fired appliances and their certification requirements;
- performance of gasfitting work and licensing requirements;
- technical requirements; and
- obligations of gas suppliers.

## 2 Definitions and terms used

**Energy Safety:** The Energy Safety Division of the Department of Commerce in Western Australia.

The Director of Energy Safety, a statutory position established under section 5 of the *Energy Coordination Act 1994* heads this division and administers electricity and gas technical and safety legislation, which includes the following:

- Setting and enforcing safety standards for consumer's gas installations
- Issuing gasfitting licences
- Designating gas inspectors
- Approving for use gas equipment and appliances
- Prohibiting the use of unsafe gas equipment or appliances.

**Master meter:** A meter installed at the point at which gas is delivered to the consumer and that is used to measure the quantity of gas delivered for billing purposes. The meter includes any associated regulators, pipes, fittings, components, equipment or instruments other than a pipeline licensed under the *Petroleum Pipelines Act 1969*.

**Consumer's gas installation:** The gas installation comprises:

- Where a master meter is installed on a consumer's property, all the pipework and gas appliances and/or apparatus installed on the downstream side of the master meter.
- Where a master meter is installed adjacent to or on a lateral of a pipeline designed to operate at a pressure in excess of 1900 kPa, all the pipework and gas appliances and/or apparatus installed on the downstream side of the master meter regardless of the pressure at which part or all of that pipework is designed to operate and irrespective of whether a part or all of the pipework is located on crown land or on private land in publicly accessible areas on the consumer's land.
- in the case of a pressurised container, all the pipework and gas appliances and/or apparatus installed on the downstream side of the primary regulator.

**Major Hazard Facility:** A place at which more than the critical quantity of Schedule 1 substances. For example, 200 tonnes of LP Gas or Natural Gas or Methane) is present under the Dangerous Goods (Major Hazard Facilities) Regulations 2007. The *Gas Standards Act 1972* and regulations also apply to consumer gas installations that form part of a Major Hazard Facility.

**Primary regulator:** A device connected to a pressurised container that automatically regulates the outlet pressure of the gas passing through it to a predetermined value.

**Gas pressure reducing station:** A facility that reduces the pressure of the gas from the transmission pipeline lateral pressure (in excess of 1 900kPa or 1.9MPa) to a pressure suitable for use in the consumer's gas pipeline. The pressure reducing station also filters the gas and when necessary includes a heater to raise the temperature of the gas prior to pressure reduction to prevent the gas falling below a safe temperature. Typically the gas pressure reducing station consists of an overpressure shutoff valve, an active and monitor regulator, a thermal relief system set at a lower pressure than the overpressure shutoff, isolation valves and a bypass all mounted on a skid ready for connection to the gas.

**Type A gas appliance:** Generally domestic or commercial gas appliances up to 500MJ/h that are specified in Regulation 42B of the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999.

**Type B gas appliance:** Generally large commercial or industrial gas appliances over 10MJ/h and not a Type A appliance or a mobile engine.

**Type B Gas Appliance Inspector:** This is an Inspector (Gas), usually independent, who is designated by the Director of Energy Safety specifically for approval and certification of Type B appliances.

**Approval for installation:** Means obtaining written approval from a Type B Gas Appliance Inspector (after desk-top review of a technical submission relating to the appliance) to allow an appliance to be installed.

**Certificate of compliance:** Certificate that is issued by a Type B Gas Inspector under Regulation 22(A)(1) of the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999 where the Gas Inspector has inspected the appliance and ascertained, as far as practicable, that it complies with requirements referred to in Regulation 32.

**Gas Installation Inspector:** This is an Inspector (Gas) designated by the Director of Energy Safety specifically for the purpose of carrying out inspections of consumer's gas installations on behalf of the gas supplier or pipeline licensee. This is to meet the gas supplier's/pipeline licensee's obligation under section 13(1) or 13(2) of the Act.

**Gas supplier:** An undertaker or an operator of a reticulated gas supply system or a person who supplies gas through a pressurised container.

**Gas fitter:** A registered gas fitter or a supervised gas fitter.

**Gasfitting authorisation:** Issued by Energy Safety to an employee of a company who has the relevant competencies to supervise a multi-skilled workforce whose tasks peripherally involve gas or to do specified work. An Authorisation Holder, also known as a Supervising Gas Fitter, may supervise the number of people specified in a Gasfitting Authorisation. The supervised gas fitters, such as electricians (wiring gas controls) or a mechanical fitter are controlled in their gas work through a combination of direct supervision, written procedures and training.

**Notice of completion:** Notice that is completed by a gas fitter or authorisation holder under Regulation 28, where the gas fitter or authorisation holder certifies that the work has been carried out in conformance with the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999.

**Pipeline Licence:** A Pipeline Licence is issued under the *Petroleum Pipelines Act 1969* by the Department of Mines and Petroleum to a Pipeline Licensee.

### 3 Regulatory requirements for consumer gas installations

A consumer's gas installation in WA that uses gas as a fuel, must comply with the requirements contained in the *Gas Standards Act 1972* and the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999. These include:

- The use of licensed gas fitters;
- Submission of notices of completion by licensed gas fitters;
- The design, construction and safe operation of the appliance complying with the requirements of the relevant technical standards/codes;
- The need for certification of an industrial or large commercial gas appliance (Type B appliance) by a Type B Gas Appliance Inspector; and
- Inspection of the installation by a gas installation inspector, on behalf of the gas supplier before gas can be permanently supplied to the installation.

A consumer's gas installation commences from the outlet of a master meter or a primary regulator (in the case of a pressurised container) and consists of piping, fittings, components and gas appliances used in the supplying and utilisation of gas as a fuel for a consumer taken as separate items or as a whole.

#### 3.1. A consumer gas installation under various gas supply scenarios

Generally there are four typical gas supply system scenarios adopted by gas suppliers to supply gas to industrial sites for the fuelling of industrial gas appliances. They are as follows:

- Natural gas supplied to an industrial site from a pipeline lateral with the master meter located at the site;
- Natural gas supplied to an industrial site from a pipeline lateral with the master meter located off-site;
- Gas supplied to an industrial site with on-site gas storage;
- Gas supplied to an industrial site with off-site gas storage.

Each of these scenarios is described in further detail in the following subsections.

### **3.1.1 Gas reticulated from natural gas laterals**

The majority of large natural gas industrial/commercial consumers are normally supplied via a lateral or branch line (single high pressure pipeline) connected to a transmission pipeline. The lateral normally terminates at the boundary of the consumer's site where the gas is metered or reduced in pressure before entering the consumer's piping system that connects to appliances.

The gas supplier/pipeline licensee usually determines the meter location, which may be located at the consumer site. This location is preferred by EnergySafety. However, recently on a number of installations the gas meter has been located at the point where the lateral connects with the transmission pipeline. The lateral is licensed under the *Petroleum Pipelines Act 1969* and responsibility transfers to compliance with the *Gas Standards Act 1972* at the demarcation point (meter, pressure reducing station valve, flange and the like) where it enters the gas installation site.

The master meter on-site and off-site scenarios are described in further detail in the following subsections.

#### **3.1.1.1 Master meter located at site**

The gas supplier/pipeline licensee usually determines the meter location, which may be located on the consumers property (This location is preferred by EnergySafety WA).

The provisions of the Gas Standards (Gas Supply and System Safety) Regulations 2000 apply to the accuracy of the master meter regardless of whether or not it is installed in pipework licensed under the *Petroleum Pipelines Act 1969*.

Downstream of the master meter, the gas installation falls under the provisions of the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999.

EnergySafety WA administers both of these sets of regulations.

As the pressure reducing station is located downstream of the meter it is covered by the Regulations. If the pressure reducing station is located upstream of the meter then it would form part of the Pipeline Licence.

Downstream of the master meter, the gas installation may also fall under the provisions of the Dangerous Goods (Major Hazard Facilities) Regulations 2007. Resources Safety Division of the Department of Mines and Petroleum administers these regulations that apply where there are dangerous substances at the place that are more than a threshold quantity as defined in Schedule 1 of these regulations. However the installation must still comply with the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999.

Upstream of the master meter, the gas pipework may be subject to a pipeline licence under the *Petroleum Pipelines Act 1969*, which is issued by the Petroleum and Royalties Division and administered in respect to safety by the Resources Safety Division of the Department of Mines and Petroleum.

#### **3.1.1.2 Master meter located off-site**

A number of industrial sites have the master meter and gas pressure reducing station installed at the off-take from the transmission pipeline, which is external to and could be some distance from the site boundary.

The gas pipeline lateral is licensed under the *Petroleum Pipelines Act 1969* and transfers to the jurisdiction of the *Gas Standards Act 1972* at the demarcation point (meter, pressure reducing station valve, flange and the like) where it enters the gas installation site. The Pipeline Licence is issued by the Petroleum and Royalties Division and administered in respect to safety by the Resources Safety Division of the Department of Mines and Petroleum.

The gas installation within the site boundary may also fall under the provisions of the Dangerous Goods (Major Hazard Facilities) Regulations 2007. Resources Safety Division of the Department of Mines and Petroleum administers these regulations that apply where there are dangerous substances at the place of more than a threshold quantity as defined in Schedule 1 of these regulations.

Where there is no Pipeline Licence, the gas piping and installation downstream of the master meter fall under the provisions of the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999.

For the section of the pipeline, if not covered by a Petroleum Pipeline Licence, that traverses public or private land (that is, land not owned by the consumer), the proponent needs under the Regulations, approval of the Director of Energy Safety before work commences for the pipeline from the master meter to the site boundary. The proponent needs to make a written submission assessing the risk posed by the design, construction, operation and maintenance of the consumer gas pipeline in the public or private area and how the risks will be managed.

### **3.1.2 Gas Reticulated from Pressurised Containers**

LP Gas, compressed natural gas (CNG) or liquefied natural gas (LNG) stored in pressurised containers are also used to supply fuel gas to industrial/large commercial sites via a primary regulator fitted to the pressurised container. The pressurised containers can be located on-site or off-site.

The container depending on its capacity may require licensing by the Resources Safety Division of the Department of Mines and Petroleum. The location, design, construction, commissioning and operation of installations for the storage and handling of LP Gas, CNG or LNG containers needs to comply with *the Explosives and Dangerous Goods (Dangerous Goods Handling and Storage) Regulations 1992* and the requirements in the relevant Australian Standards for the storage and handling of LP Gas, CNG or LNG. These requirements are also administered by the Resources Safety Division.

The gas installation downstream of the primary regulator falls under the provisions of the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999. EnergySafety WA administers these regulations.

Where the pressurised container is located off-site, the gas pipeline (between the pressure regulator and the demarcation point where it enters the site) may be licensed under the *Petroleum Pipelines Act 1969*. Responsibility transfers to compliance with the *Gas Standards Act 1972* at the demarcation point (valve, flange and the like) where it enters the gas installation site.

The gas installation within the site boundary may also fall under the provisions of the Dangerous Goods (Major Hazard Facilities) Regulations 2007. Resources Safety Division of the Department of Mines and Petroleum administers these regulations that apply where there are dangerous substances at the place of more than a threshold quantity as defined in Schedule 1 of these regulations.

The on-site and off-site gas storage scenarios are described in further detail in the following subsections.

#### **3.1.2.1 On-site gas storage**

LP Gas, CNG or LNG stored in on-site pressurised containers may be used to supply fuel gas to industrial/large commercial sites via a primary regulator fitted to the pressurised container then through the consumer gas piping system that connects to appliances. Figure 1 shows a gas supply to an industrial site from on-site CNG, LNG or LPG storage.

The gas installation downstream of the primary regulator falls under the provisions of the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999. EnergySafety WA administers these regulations. The gas supplier or the consumer can own the pressurised container, which is located on the consumer site.



**On-site LP Gas storage**

### **3.1.2.2 Off-site gas storage**

Some industrial sites have LP Gas, CNG or LNG stored in off-site pressurised containers some distance from the consumer site boundary.

Where there is no Pipeline Licence issued, the gas piping and its installation downstream of the primary regulator fall under the provisions of *the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999*. The gas supplier normally owns the pressurised container.

For the section of the pipeline that has no Pipeline Licence and traverses public or private land (that is, land not owned by the consumer), the proponent needs under the Regulations approval of the Director of Energy Safety, before work commences for the proposed gas pipeline from the primary regulator on the pressurised container to the site boundary for an LP Gas, compressed CNG or LNG supply.

The proponent needs to make a written submission assessing the risk posed by the design, construction, operation and maintenance of the consumer gas pipeline in the public or private area and how the risks will be managed.

## **3.2 Type B Gas Appliance and Certification**

The regulatory and certification requirements for Type B appliances are described in further detail in the following subsections.

### **3.2.1 Type B Appliances**

Type B appliances are large commercial and industrial appliances which can be boilers, reformers, industrial ovens, heat-treatment furnaces, calciners, rotary kilns, process kilns, gas turbines and gas engines and the like that require extensive construction, assembly, commissioning and testing on site and are certified following installation and prior to use by the owner/operator.



**Type B appliance - stationary gas engine**

The installation of Type B appliances in a consumer's gas installation must comply with the various regulatory requirements, which include a Type B Gas Appliance Inspector giving 'approval for installation' and the use of licensed gas fitters to undertake the installation work. Following installation, the inspection and certification is undertaken by a Type B Gas Appliance Inspector to ensure that the design, construction and safe operation of the appliance complies with the requirements of the relevant technical standards/codes.

### **3.2.2 Certification of Type B Gas Appliance**

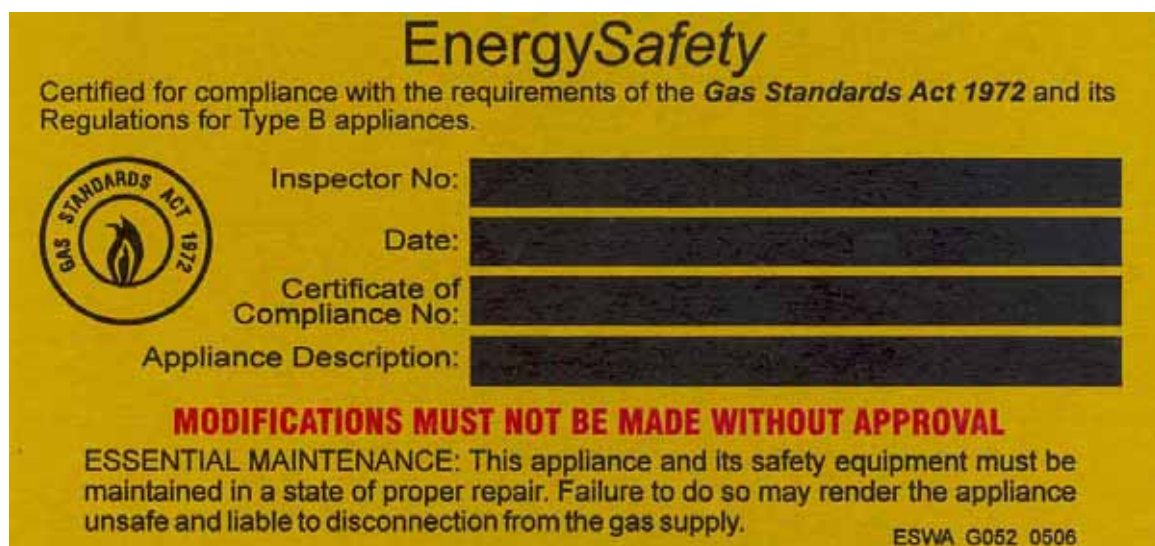
The designer, equipment vendor or the contractor is responsible for establishing the requirements for the installation of the Type B gas appliance and engaging a Type B Gas Appliance Inspector, on a fee for service basis, to carry out approval/certification of the Type B appliance. The Type B Gas Appliance Inspector must be appointed before the commencement of any gas installation work.

A brief summary of the regulatory approval process for such appliances is as follows:

- 'Approval for installation' shall be obtained as per Item 501(2) of Schedule 6 of the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999. This requires the owner/operator or anyone acting on his/her behalf, for example, designer or appliance vendor/installer to satisfy a Type B Gas Appliance Inspector, through a technical submission (a desktop appraisal) that the appliance will satisfy the technical standards required by Regulation 32. The appliance can then be installed.
- Following installation, the gas fitter who is responsible for commissioning the appliance requests the gas supplier's permission for the provision of gas for commissioning. The request needs to be endorsed in writing by the Type B Gas Inspector.
- Following commissioning by the gas fitter, the Type B gas appliance needs to be inspected by the Type B Gas Appliance Inspector and a certificate of compliance issued by the inspector. This is done through an on-site demonstration to the Inspector that the appliance as installed complies with all the technical and safety regulatory requirements and involves checks of the combustion process, the safety interlocks and protective devices and the like.

The Type B Gas Appliance Inspector may issue a certificate of compliance (Regulation 22A) when satisfied that the installation meets prescribed requirements. The certificate of compliance is issued by giving the original of the certificate in an approved form to the Director of Energy Safety and copies of the certificate to the gas fitter, the consumer and the relevant gas supplier. The Inspector then attaches a metal badge to the appliance, signifying that the gas appliance complies with prescribed requirements. This allows, following the gas supplier's approval, permanent gas supply (Refer to the sub clause **Permanent Gas Supply**) for the operation of the gas appliance.

A sample of an Inspector's Compliance Badge is provided below.



For more detail information on how to get a Type B appliance certified and approved for use, refer to “*Guidelines for the Approval of Industrial Gas Appliances (Type B Appliances) in Western Australia*” issued by EnergySafety WA and available, for free download, from the EnergySafety WA website at [www.energysafety.wa.gov.au](http://www.energysafety.wa.gov.au)

### 3.3 Performance of Gasfitting and Licensing Requirements

It is illegal for a person to do any gasfitting work on a consumer's gas installation unless the person is currently registered with EnergySafety WA to carry out such work.

The licence may take the form of a permit or an authorisation. Only workers with a current licence issued by EnergySafety WA to do that type of gasfitting work may install, construct, commission, service and maintain consumer's gas appliances and gas piping systems.

Gasfitting is categorised into various classes for licensing purposes. A gas fitter with a Class I permit can carry out gasfitting work on installations that consist of large commercial and industrial gas appliances (Type B appliances) and associated pipework, as well as servicing these gas installations.

Restricted permits are issued for special purposes and for the duration of the project (specific periods of three to 12 months) and are usually limited to a specific job or employer. Examples of these include:

- welding of gas piping;
- commissioning of industrial gas appliances; and
- specialised work.

For large industrial gas installations a ‘gasfitting authorisation’ may be issued to an employee of a company to supervise or do specified work for the duration (up to 12 months) of the project of installing the gas appliances. The authorisation can be issued to a current permit holder (Class I) or an Engineer after proving his/her skills and knowledge to do or to supervise gasfitting work and knowledge of relevant legislation, and payment of an application fee to EnergySafety WA. The person is then considered an authorisation holder for the installation.

A licensed gas fitter or authorisation holder who does gasfitting work on a consumer's gas installation must ensure that the work is done in a safe manner, complies with the requirements in the regulations and standards, is safe to use and completed to a trade finish.

On completion of the particular gasfitting work, the licensed gas fitter or authorisation holder must attach a compliance badge to the appliance. This badge signifies that the gasfitting work performed complies with the relevant standards and regulations.

The licensed gas fitter or authorisation holder must also give a notice of completion to the Gas Supplier and the person for whom the gasfitting work was done.

### **3.4 Technical Requirements**

Technical requirements for Type B appliances in relevant standards and codes and reference to a guideline on the gas pressure reducing station are described in detail in the following subsections.

#### **3.4.1 Relevant Codes and Standards**

Type B gas appliances installed in consumer's gas installations must comply with the requirements in Schedule 6 and the codes and standards listed in Schedule 7 of the Gas Standards (Gasfitting and Consumer Gas Installations) Regulations 1999.

The codes and standards listed include:

- AS 3814 – Industrial and commercial gas fired appliances, which provides minimum technical requirements for the design, construction and safe operation of an industrial gas-fired appliance;
- AS 1375 – Industrial fuel-fired appliances, which provides requirements regarding safety principles for industrial appliances such as critical time and energy calculations and explosion damage protection;
- AS 5601 – Gas installations, which provides gas appliance installation requirements as well as piping systems up to 200kPa;
- AS 4041 – pressure piping, for above ground steel piping exceeding 200 kPa;
- AS 4645.2 – Gas distribution networks – Steel pipe systems, for below ground steel piping operating at a pressure not exceeding 1050kPa;
- AS 2885 – Gas and liquid petroleum, for below ground steel piping operating at a pressure of or exceeding 1050 kPa; and
- AS 4645.3 – Gas distribution networks – Plastic pipe systems, for below ground plastic pipe.

AS/NZS 4130: Polyethylene (PE) pipes for pressure applications, also provides a standard specification for manufacturers and purchasers of polyethylene pipes used for pressure applications.

#### **3.4.2 Gas Pressure Reducing Stations**

For guidelines covering the safety aspects of the design of gas pressure reducing stations where the consumer piping pressure exceeds 200kPa refer to 'Safety aspects on the design of gas pressure reducing stations' on the EnergySafety WA website [www.energysafety.wa.gov.au](http://www.energysafety.wa.gov.au).

## **4 Gas supplier's obligations**

Gas suppliers in Western Australia are required under section 13(1) of the Act, to commence to supply gas to a newly installed consumer gas installation or supply gas to a consumer installation that has been altered by the installation of a Type B gas appliance, if and only if, the installation has been inspected by an inspector (Gas Installation Inspector) and complies with the requirements, if any, prescribed in respect of that installation.

### **4.1 Gas for Commissioning**

A gas supplier may provide gas for the commissioning of a Type B appliance, which has been approved for installation by a Type B Gas Appliance Inspector providing:

- the relevant gas fitter or authorisation holder has submitted a notice of completion for the gas installation up to and including the Type B appliance;
- the period for which the gas for commissioning is provided does not exceed a period approved by the Type B Gas Appliance Inspector; and
- the gas supplier verifies by inspection or other means the following aspects, such as pipework integrity, colour coding, correct settings of pressure controls, adequate siting of ventilation, flues, vents, etc. and installation by licensed gas fitter.

### **4.2 Permanent Gas Supply**

A gas supplier is required to provide confirmation to the owner/operator advising that the gas appliance can be used permanently in production mode:

- after receiving a copy of the notice of completion (for the commissioning of the appliance);
- after receiving a copy of the certificate of compliance for the appliance, which has been issued by the Type B Gas Appliance Inspector; and
- having inspected or by other means satisfied itself that the gas installation is safe to receive gas supply.

## **5 FIGURES**

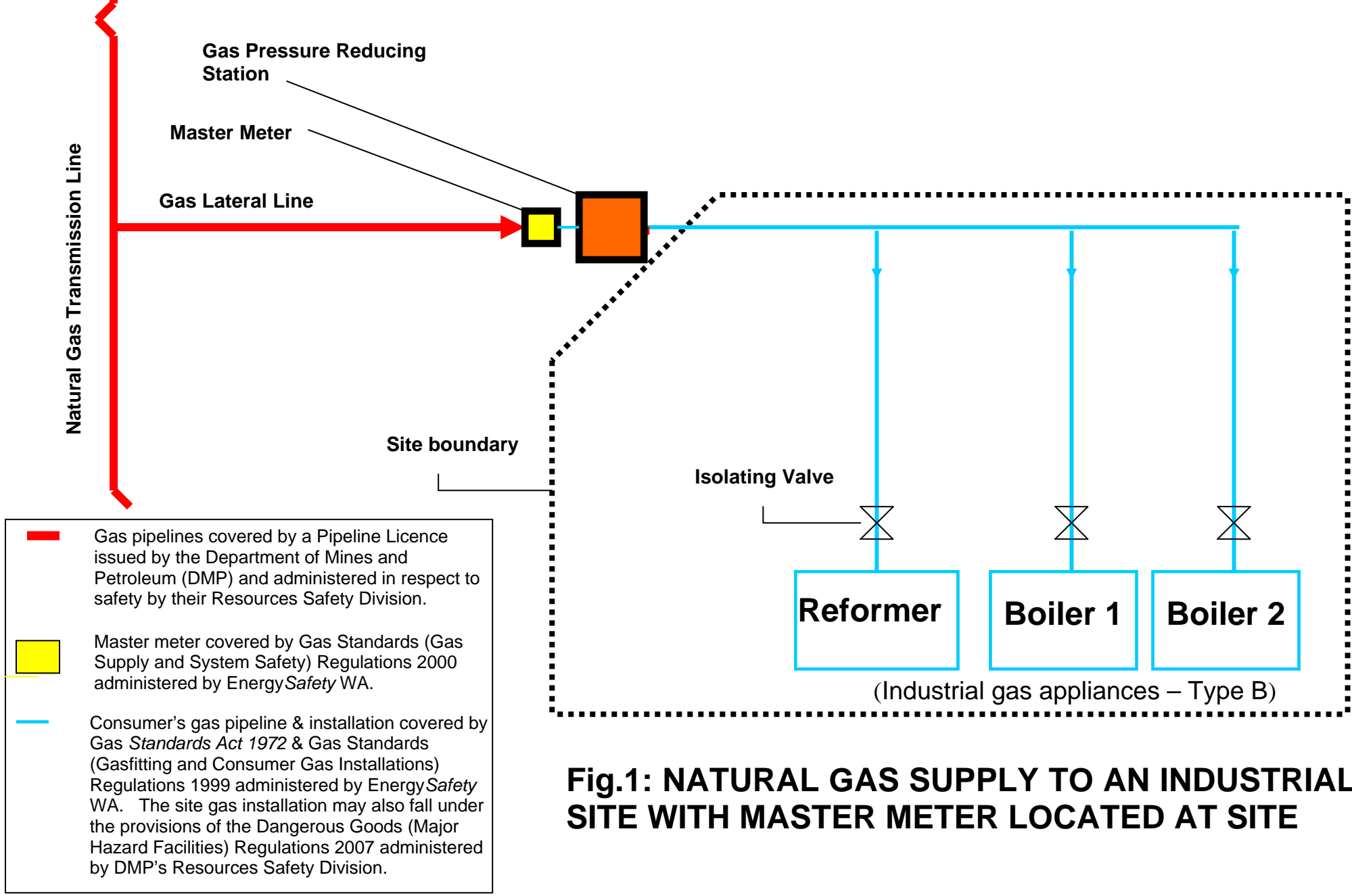
***Figure 1 Natural gas supply to an industrial site with master meter located at site***

***Figure 2 Natural gas supply to an industrial site with master meter located off-site***

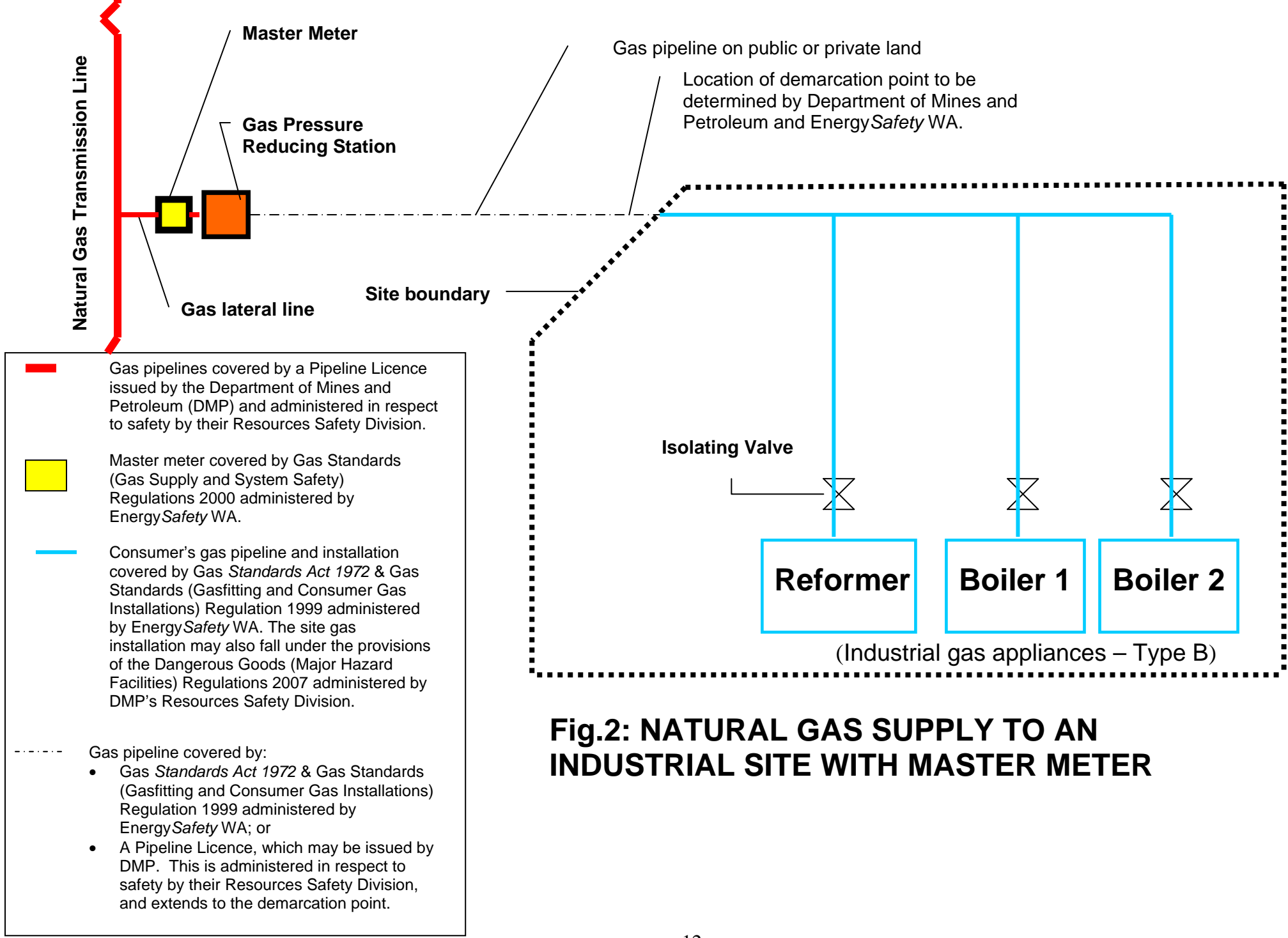
***Figure 3 Gas supply to an Industrial site with on-site gas storage***

***Figure 4 Gas supply to an industrial site with off-site gas storage***

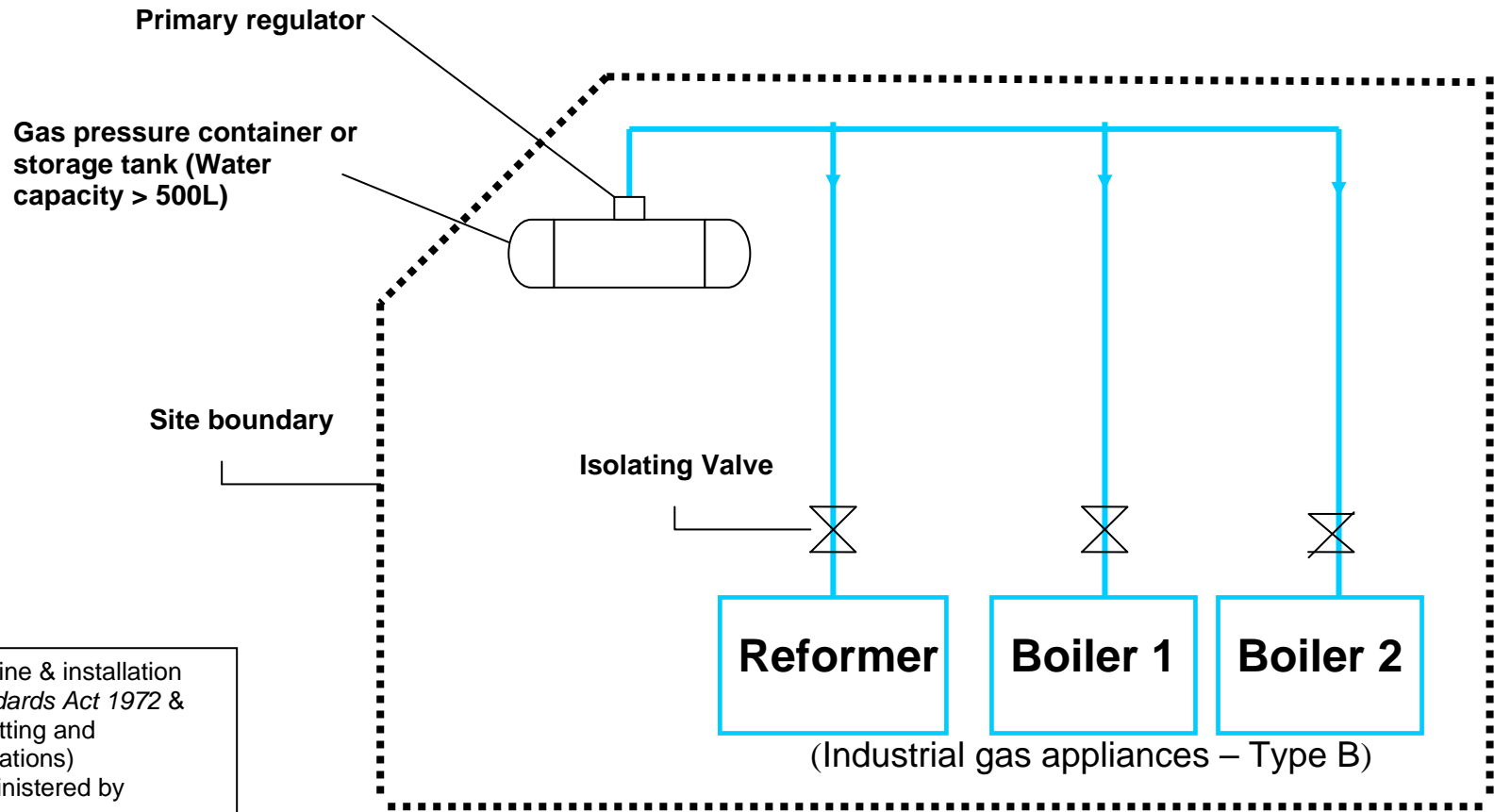
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**Fig.1: NATURAL GAS SUPPLY TO AN INDUSTRIAL SITE WITH MASTER METER LOCATED AT SITE**

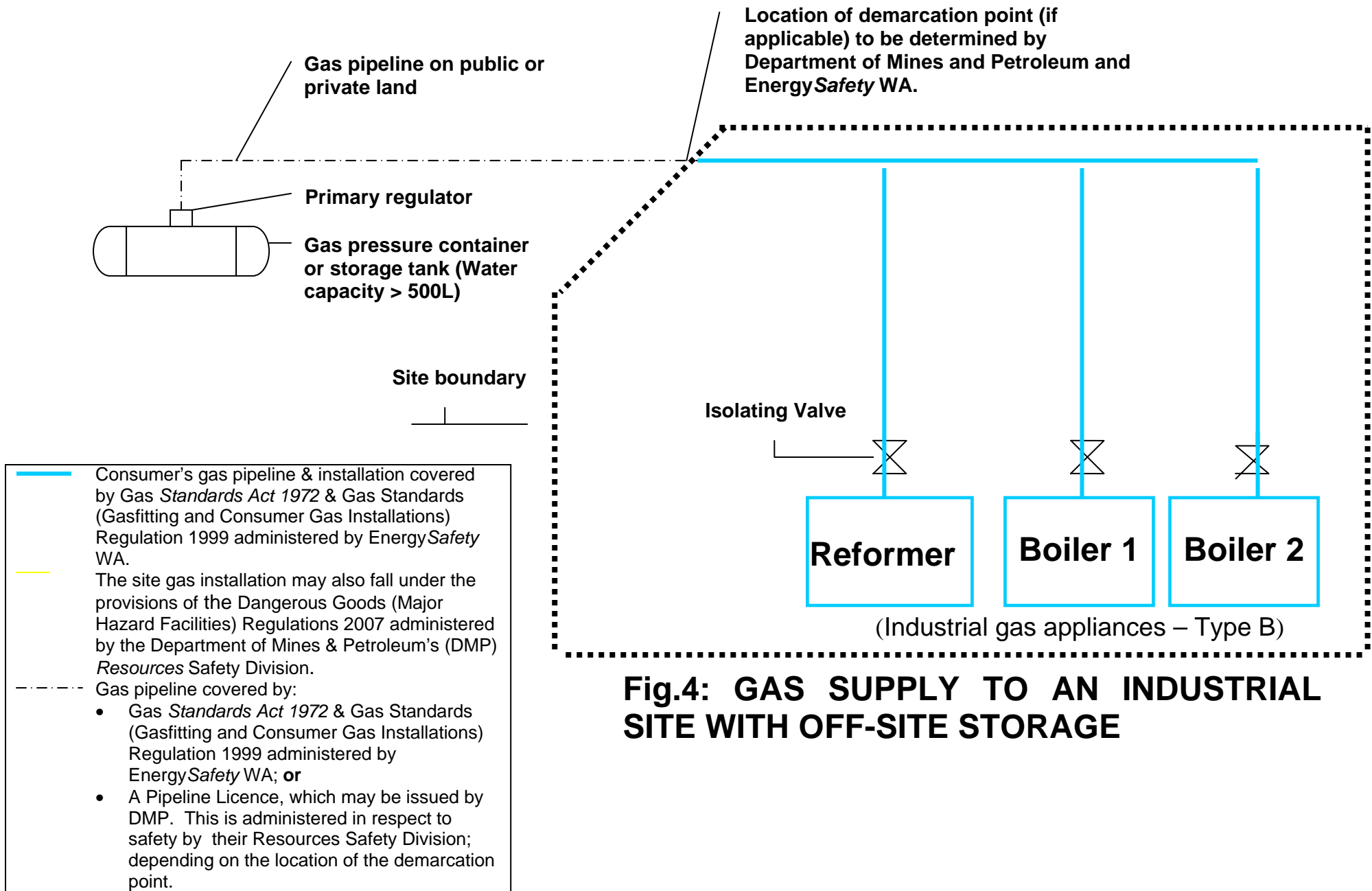


**Fig.2: NATURAL GAS SUPPLY TO AN INDUSTRIAL SITE WITH MASTER METER**



 Consumer's gas pipeline & installation covered by *Gas Standards Act 1972* & *Gas Standards (Gasfitting and Consumer Gas Installations) Regulation 1999* administered by *Energy Safety WA*.  
 The site gas installation may also fall under the provisions of the *Dangerous Goods (Major Hazard Facilities) Regulations 2007* administered by the Department of Mines & Petroleum, Resources Safety Division.

**Fig.3: GAS SUPPLY TO AN INDUSTRIAL SITE WITH ON-SITE STORAGE**



**Fig.4: GAS SUPPLY TO AN INDUSTRIAL SITE WITH OFF-SITE STORAGE**