

# Gas Standards and Safety

# Guidance Note

March 2015

(GNI09) Version: 1.0

## **GUIDELINES FOR THE DEVELOPMENT AND SUBMISSION OF GAS INSTALLATION SAFETY MANAGEMENT SYSTEMS**

### ***Gas Act 2000 and Gas (Safety) Regulations 2014***

This guide provides general information for applicants who have been required by the Director to prepare a gas safety management system for a complex gas installation – in accordance with Regulation 46(3)(f) and (g) of the Gas (Safety) Regulations 2014.

### **INTRODUCTION**

The Director of Gas Safety (the Director) may impose conditions on a gas installation acceptance, in line with Section 77 of the *Gas Act 2000*. This is dependent on the complexity and risk posed by complex gas installations.

The risk reduction measures detailed within the gas installation safety management system must demonstrate to the Director that the gas installation, including appliances and associated equipment, cannot cause any risk of injury or fatality.

Section 77 of the Act requires that a person working on a complex gas installation submit an application for acceptance to the Director in order for the Director to be satisfied that the relevant standards have been met. The Director may make certain conditions on the acceptance, and the acceptance takes effect when the conditions are met. A complex installation must not be commissioned until the Director has accepted an application and all conditions are met.

Regulation 46(3)(f) requires that the applicant demonstrates to the satisfaction of the Director that an analysis of the risks associated with the operation and maintenance of a gas installation has been completed in accordance with AS/NZS ISO 31000 – Risk management – Principles and guidelines.

Regulation 46(3)(g) requires that the applicant provide the Director with a copy of the safety management system for the gas installation which conforms with AS/NZS 4801 – Occupational health and safety management systems.

The information provided will enable the Director to determine that the requirements and objects of the Act are being met and the gas installation is designed and managed to convey or process gas, or another regulated substance safely.

## DEFINITIONS

**Gas** means –

- a) Natural gas; or
- b) Liquefied petroleum gas; or
- c) Any other gaseous fuel, being a gaseous fuel that is not declared by the regulations to be excluded from the operations of this Act. (Including bio gases).

**Gas installation** means - in respect of the use or intended use of gas, a combination of-;

- a) Any pipe or system of pipes for, or incidental to the conveyance of gas and components or fittings associated with the pipe or pipes which are downstream from the gas supply point; and
- b) Any one or more of the following;
  - i. Any appliance and associated components or fittings which are downstream from the gas supply point;
  - ii. Any meter which is downstream from the gas supply point;
  - iii. Any means of ventilation or system for the removal of combustion products which is downstream from the gas supply point

**Gas Supply Point** means -

- a) The outlet of a gas entities meter assembly used to measure a customers gas use; or
- b) If paragraph (a) does not apply, the point of delivery of gas between the gas entity and the customer; or
- c) If paragraph (a) and (b) do not apply, the point of delivery of gas between-
  - i. A pipeline that is declared, or belongs to a class of pipelines that is declared, under sec 3(3) of the Gas Pipelines Act 2000 to be treated as a transmission pipeline for the purposes of the Act; and
  - ii. The person to whom the gas is delivered; or
- d) If paragraphs (a) (b) and (c) do not apply, the outlet of the first stage regulator of a liquefied petroleum gas storage cylinder or tank; and a gas installation; or
- e) If paragraphs (a) (b) (c) (d) do not apply any other point of supply of a gaseous fuel.

**Gas Storage System** means - a container an all associated pipework, components, equipment and fittings-

- a) through to-
  - i. the outlet of the first gas pressure regulator supplying a gas installation; or
  - ii. the outlet of an automotive refuelling dispenser; or
- b) relating to any consumers gas storage system, contained in the liquid or vapour phase, forming part of a gas installation that-

- i. uses liquefied petroleum gas, compressed natural gas or liquefied natural gas; and
- ii. is downstream of the gas supply point.

**Incident** means - any incident or event relating to the conveyance, supply or use of gas or another regulated substance which causes or has the potential to cause –

- a) death or injury to a person; or
- b) significant damage to property; or
- c) an uncontrolled explosion, fire or discharged of gas or another regulated substance; or
- d) an impact on the security of supply.

### **APPLICABLE STANDARDS** (where relevant)

AS 1375 - Industrial fuel-fired appliances  
AS/NZS 1596 – The storage and handling of LP Gas  
AS 3814 - Industrial and commercial gas-fired appliances  
AS 3931 - Risk analysis for technological systems  
AS/NZS 3961 - The storage and handling of Liquefied Natural Gas  
AS/NZS 4801 - Occupational Health and Safety Management Systems  
AS/NZS ISO 31000 - Risk management - Principles and guidelines  
AS/NZS 5601 - Gas installations (parts 1 and 2 as applicable)  
AS/NZS 60079 - Explosive Atmospheres

## **GAS INSTALLATION SAFETY MANAGEMENT SYSTEM**

### **Presentation**

- The main text is to be written in plain English in a clear and concise style that is easily understood by the general reader.
- Technical specification should be in metric units. Layout plans should be accurately detailed and to scale.
- Any supplementary reports, specifications, certifications or certifying body verifications are to be provided in appendices so as to support of the submission.
- All sources of external information should be referenced, demonstrate currency of information and demonstrate how reliability is assessed. If historical records are available from similar installations, detail of the historical operational safety and reliability performance of known operations should also be provided.

### **Submission**

- The submission is to be presented in hardcopy or electronic format and should be created using the word processing program, Microsoft WORD.

- Proprietary or copyright information must be identified and will not be released to the public by the Director of Gas Safety as required by Section 13 of the Act “Obligation to preserve confidentiality”.

### **Structure**

The following section has been set out in a manner which may be adopted as the structure of a gas safety management system. Any gas safety management system must meet the requirements of the Gas Act 2000, sec 77 (5) and the Gas Safety Regulations 2014 regulation 46 (3)(f) & (g)

Not all heading structures nominated in these guidelines will have the same degree of relevance to all proposed activities. Depending on the complexity, use, location, risks and operation of a gas installation some of the headings identified in the following guidelines may be more relevant than others. Suggested headings are:

- Foreword
- Table of Contents
- Executive Summary
- Existing Environment
- Organisation Overview
- Plant layout
- Identification of foreseeable risks
- Thermal safety
- Fire and explosion controls
- Emergency Communications systems
- Gas specifications
- Qualifications
- Maintenance management
- Training and Competency
- Incident Reporting
- Monitoring and Review

### **General Information**

#### **Forward**

The safety management system should provide a brief outline of the process, location and operation of the gas installation including the risk assessment model and layers of protection modelling, complying with applicable standards, as demonstrated in the submission content.

## Table of Contents

Table of contents of the gas safety management system with reference to page numbers, figures, attachments and tables.

## Executive Summary

Executive summary of the submission providing a clear and concise overview of the proposal and its technical, safety aspects, outline of models adopted to identify foreseeable hazards, formal safety assessment, event analysis and an overview of the management systems and preventative models to be used to control the operations of the gas installation, site processes and risk from incidents on the site.

## Existing Environment

Provide a general description of the surrounding physical environment, its industrial and domestic building topography and population centres.

The applicant must include a site and location plan including, site boundary dimensions, as well as, adjoining public and private infrastructure, properties, and surrounding buildings and easements which may be affected in the event of all foreseeable emergency events or incidents.

## Organisational Overview

The submission must:

- Nominate the applicant's legal entity and organisational structure
- Nominate the office or position of the person responsible for the day to day operation of the gas installation
- Demonstrate that the person responsible for the day to day operation of the gas installation is competent to discharge and perform their functions as such.

If applicable, the applicant must provide the details of the Project Manager responsible for leading and coordinating all construction project activity and the project team.

## Plant Layout

Detailed site plans and descriptions must be supplied including all layout and piping and instrumentation designs and features that are complementary to the control measures identified as a result of the formal safety assessment for the gas installation, as well as, any process flow diagrams.

The plan must identify and quantify any feed stock, hazardous substances, chemicals, bulk storage, solid, gaseous and liquid waste or by-products which will be on the site during normal operations.

A dossier of all hazardous areas as defined in the AS/NZS 60079 series of Standards for electrical equipment is required, if applicable.

### Identification of foreseeable risks

To demonstrate acceptable safety integrity levels for the gas installation, the gas safety management system risk model must be based on AS 4360 Risk Management (qualitative) or AS 3931 Risk analysis of technological systems (quantitative).

The gas safety management system must provide for the identification of all foreseeable risks related to the operation, maintenance and misuse of the gas installation including the safety measures to be implemented to negate collateral damage or any other adverse effects to the installation or its surrounds.

### Thermal Safety

The safety management system should take into account the results and measures identified in a fire and explosion risk analysis. Considerations should include but not be limited to:

- Spatial limitations that may cause potential ignition sources being installed in or near gas equipment or systems
- Spatial limitations that may result in staff being in or near gas equipment or systems
- High temperatures and hot surfaces rotating equipment
- The inherent fire hazard presented by the release of flammable liquids or vapours, whether during normal or abnormal operations
- The storage and handling of hazardous substances in the proximity
- Depressurisation and purging of installations for maintenance operations.

### Fire and Explosion Controls

The fire and explosion controls should be specified and include measures such as:

- Risk mitigation/elimination
- Fire detection
- Fire control such as extinguishment
- Installation isolation, both automatic and manual
- Explosion mitigation, explosion proof equipment and explosion containment
- Emergency escape/evacuation and response measures.

### Emergency Communication Systems

An emergency response plan forming part of the safety management system should demonstrate adequate capability in the event of an emergency. As a minimum it should include all emergency services' contact details for fire, police, medical and gas supplier. Consideration should also be given to

adjoining facilities which may be affected by an emergency, any remote or isolated personnel on site for both normal operating time and after hours and security contact details.

### **Gas Specification**

Biogas, municipal waste gas or industrial “off gas” gases from process plant will require independent gas assessment. This assessment should include:

- Lower exposition limit
- Upper explosion limit
- Methane % mol.v in air
- Nitrogen % mol.v in air
- Water vapour % mol.v in air
- Carbon dioxide % mol.v in air
- Carbon monoxide % mol.v in air
- Other % mol.v in air

Indication should be given as to the process being anaerobic or aerobic. Gas detection systems should consider lack of gas odorant and/or masking as a risk.

Note: This gas assessment would normally be required by gas installation designers and installers prior to commencing such works.

Further information can be found in ‘Gas Standards and Safety Guidance Note Gas Safety - Gas Installations Supplied from biogas facilities GNI06’ and ‘Guidance Note Gas Safety - Biogas gas composition certification GNI07’.

### **Qualifications**

The safety management system must satisfy the Director that each person undertaking the design, construction or installation, or commissioning for a gas installation has the necessary qualification, competence and ability, and has access to information.

### **Maintenance Management**

Detail in the gas safety management system should include inspection, maintenance, calibration and safety testing schedules, as well as, maintenance records for all gas installation, mechanical, electrical, control and communications equipment. Reference should be made to applicable standards and manufacturer’s instructions when developing a maintenance regime.

### **Training and competency**

Applicants should demonstrate that a documented system is in place for all initial and ongoing gas training, competency schedules and licensing requirements for operators, maintenance personnel, contractors and staff.

### **Incident Reporting**

A system must be in place related to the reporting and recording of all incidents including near misses related to gas installations with a view to evaluate those incidents. The identification and elimination of systemic issues, identification of training needs, suitability of equipment, housekeeping and working environments need to be considered within the evaluation of incidents.

The safety management system must also reflect the requirements of Regulation 53(3) in the fact that an owner of a Type B appliance must, as soon as practicable, report any incident that occurs to the Director and to the gas entity or gas supplier which supplies gas to the gas installation of which the appliance forms part.

### **Monitoring and Review**

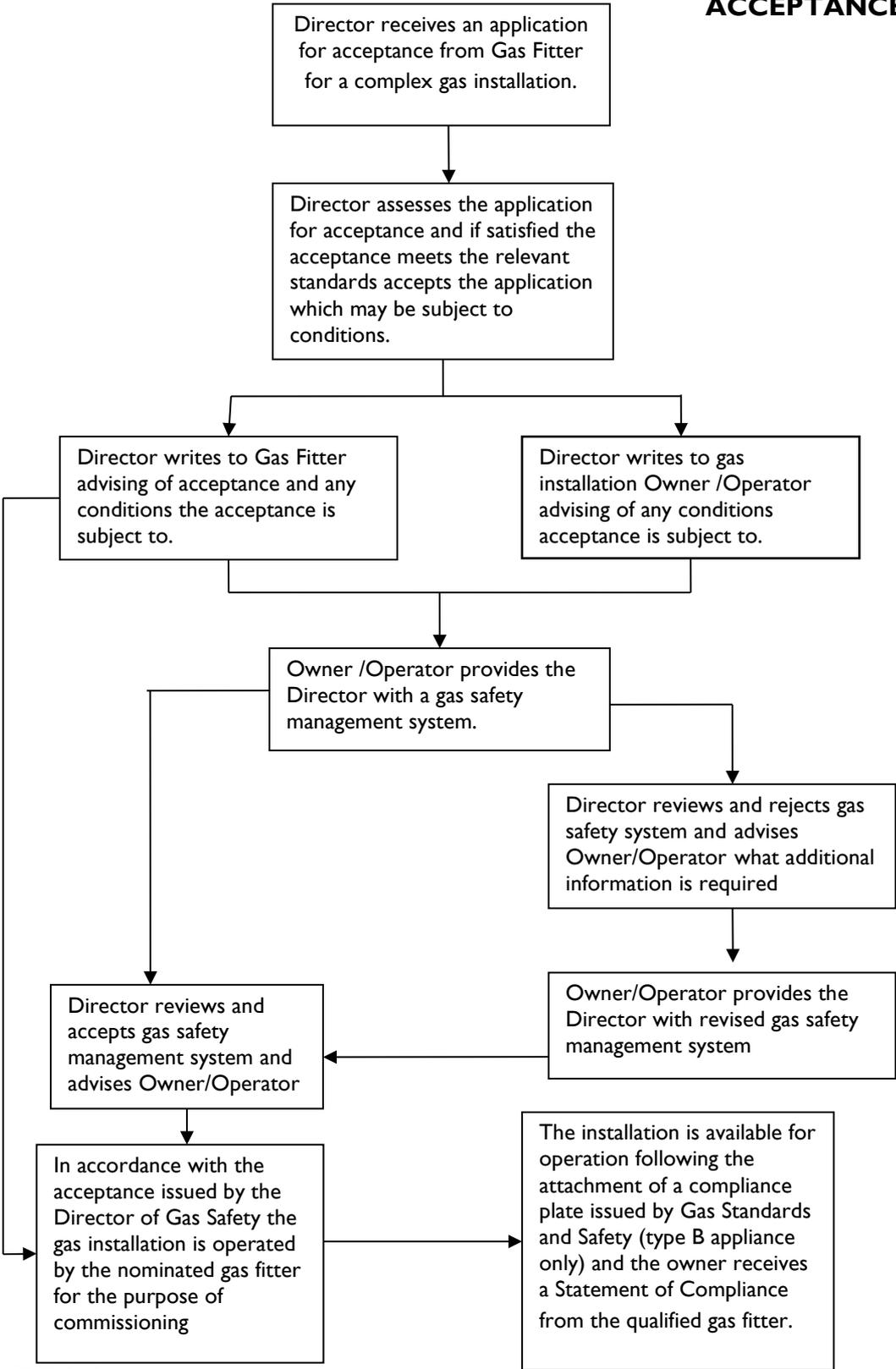
The gas safety and management system should demonstrate it will provide continuous monitoring, auditing and review of the implementation of safety policies, procedures and performance standards. Change management processes are to be outlined including changes to risk, for gas installations and associated control systems due to modifications, upgrades, programming changes and personnel changes.

In respect to Type B appliances, all risk assessments should be reviewed once every six years or on a significant change to the Type B appliance or its operating environment to ensure that prevention and mitigation layers of protection remain in place and are effective.

## **REGULATORY COMPLIANCE**

The Director may place additional conditions on any acceptances issued under Section 77 of the Act. If an approval issued by the Director is subject to the condition that a safety management system for a gas installation is submitted and accepted, the Director may stipulate that the installation is not commissioned before the safety management system is accepted.

# ACCEPTANCE FLOW CHART



This document has been produced and published by the Building Standards and Occupational Licensing Division of the Department of Justice. Although every care has been taken in the production of the work, no responsibility is accepted for the accuracy, completeness, or relevance to the user's purpose, of the information. Those using it for whatever purpose are advised to verify it with the relevant government department, local government body or other source and to obtain any appropriate professional advice. The Crown, its officers, employees and agents do not accept liability however arising, including liability for negligence, for any loss resulting from the use of or reliance upon the information and/or reliance on its availability at any time.