

Gas Information Sheet No. 07

Consumer piping - high pressure gas installations

This information sheet informs gasfitters and gas installers of their responsibilities for the installation of high pressure gas installations in excess of 200 kPa in consumer premises.

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1 Definitions

In this information sheet:

- **Application for Acceptance form.** This form, formally titled “Application for Acceptance of Complex Gas Installations and Type B Appliances form”, is required to be completed for all high pressure and high capacity gas installations.
- **Complex gas installation.** Refer to Gas Information Sheet 33 to determine, by building class, whether or not your installation comes under the complex gas installation criteria.
- **Consumer piping** has the same meaning as defined in AS/NZS 5601:2013, section 1.8.19 Consumer piping.
- **ESV** means Energy Safe Victoria.
- **Gas installation** has the same meaning as defined in the Gas Safety Act 1997, Part 1, 3 Definitions (1) gas installations.
- **Gas installer** means all those persons engaged in the design, specification, construction and commissioning process **and** are likely to be under the direction of a professional pipework engineer.
- **Gas piping systems** include pipeline components, such as pressure regulators; therefore ESV applies Gas Safety (Gas Installation) Regulation 27 to the complete gas installation from the billing meter to the appliance isolation valve.
- **GIS.** Acronym for gas information sheet.
- **Gas Safety (Gas Installation) Regulations 2008.** These regulations provide for standards, procedures and acceptance of appliances and installations for gas fitting work.
- **HiPAC.** Acronym meaning high pressure and high capacity gas system.
- **Pipeline component** means all fittings, valves, meters and other devices installed within or on consumer piping and forming part of the gas installation.

2 Introduction

Gas Safety (Gas Installation) Regulations 2008¹ require that gas installations operating in excess of 200 kPa must comply with Standards determined by Energy Safe Victoria (refer to Part 3 Division 5 Regulation 27).

The scope of AS/NZS 5601 Gas Installations, as a comprehensive Standard, does not generally extend beyond 200 kPa. ESV has chosen not to nominate specific Standards from those available but rather to review the Standard(s) offered for the specific installation.

Note: Typical pipework standards that are applied and preferred are AS 4041 Pressure piping or AS 2885 Pipelines – Gas and liquid petroleum, Parts 0, 1, 2, 3 and 5.

Appendix 1

This flowchart outlines the Application for Acceptance process for these gas installations.

¹ A full copy of the Regulations can be found at [http://www.legislation.vic.gov.au/domino/Web_Notes/LDMS/LTObject_Store/LTObjSt4.nsf/d1a8d8a9bed958efca25761600042ef5/baa61b9f4da9e2d6ca25776100360cc0/\\$FILE/08-165sr001.pdf](http://www.legislation.vic.gov.au/domino/Web_Notes/LDMS/LTObject_Store/LTObjSt4.nsf/d1a8d8a9bed958efca25761600042ef5/baa61b9f4da9e2d6ca25776100360cc0/$FILE/08-165sr001.pdf)

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Application and self assessment forms are also provided to assist gas installers in identifying gas installation characteristics where Energy Safe Victoria requires information. This information must be provided in support of your application.

Appendix 2 and 3

Provided to assist you in assessing risks in relation to your installation.

Appendix 4

Provides a self assessment guide for application documents and determining generic hazards to assist applicants in preparing their Application for Acceptance and provide ESV with relevant information in a concise form.

For pressures exceeding 1050 kPa a detailed engineering proposal for the design must be submitted along with your application and self assessment forms. The proposal must be consistent with the chosen standards.

Note: Discuss with the Distribution Business the location of the gas meter. It is preferable to locate the meter on the property boundary to allow ease of access to Distribution Business personnel and property owner personnel.

Note: Applicants should consult the Pipelines Act to identify if there are special needs for the consumer piping.

Appendix 5

Contains a representative list of published technical standards relevant to gas installations.

Appendix 6

Provides an example of a Consumer Piping Installation diagram

3 Application for Acceptance

General information to be provided in the application for acceptance under Gas Safety (Gas Installation) Regulations and completed by a person considered suitable by ESV (refer to Part 3 Division 5 Regulation 31(5)).

For high pressure gas installations ESV will require a written proposal explaining the work to be carried out and it must contain the following information:

- A project outline.
- A completed Schedule 7 (this is part of the Application for Acceptance form, (see <http://www.esv.vic.gov.au/Gas-Professionals/Gas-installations/Application-forms>).
- A signed Start Work Notice (Schedule 10) - this is a part of the Application for Acceptance form.
- A completed Schedule 8 (see Gas Safety (Gas Installation) Regulations, Schedule 8 or download the schedule from (<http://www.esv.vic.gov.au/Portals/0/Gas%20Professionals/Files/Compliance/SCHEDULE%208.doc>).
- A site survey and route selection for the gas installation.

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- A risk assessment of the job.
- Check lists and self assessment documentation.
- A list Standards used for the installation.
- A welded joints non-destructive testing plan.
- Welding procedure specifications.
- Strength and service leak test procedures.
- Purging procedures.
- “Fit for purpose” and “Hand-over” notification for the gas installation.
- An engineering design proposal for installations over 1050 kPa.

3.1 Project outline

You must clearly describe your proposal in English.

This must be sufficiently descriptive and provide enough technical information to summarise your proposal. It can be in electronic format but must use commonly available file formats.

3.2 Application for Acceptance form: Schedule 7

Schedule 7, of the Gas Safety (Gas Installation) Regulations 2008, must be completed for all gas installations. This is part of the Application for Acceptance form for complex and Type B gas installations. This form can be downloaded from the Energy Safe Victoria website (see <http://www.esv.vic.gov.au/Gas-Professionals/Gas-installations/Application-forms>).

Gas installers working with pressures exceeding 200 kPa must complete Section 1, Schedule 7 of the gas application form, including Part A of “Type of Work” section.

Section 2 must be completed in terms of the complex gas installation information. Appliance information should be provided if known.

3.3 Application for Acceptance form: Start Work Notice

A Start Work Notice (Gas Safety (Gas Installation) Regulations 2008) must be completed for all gas installations. This is Section 3, Schedule 10 of the Application for Acceptance form (see page 4, <http://www.esv.vic.gov.au/Gas-Professionals/Gas-installations/Application-forms>).

Note: Only complete the Start Work Notice for your Application for Acceptance form for your submission. The Compliance Notice (Schedule 11) contained in the form is completed at the end of the installation job when all testing and documentation has been completed.

3.4 Schedule 8

Schedule 8 is titled “Additional Information to be Supplied by Persons Seeking Acceptance of Certain Gas Installations” and is a part of the Gas Safety (Gas Installation) Regulations 2008. It must be completed for all gas installations with pressures exceeding 200 kPa (download the schedule from <http://www.esv.vic.gov.au/Portals/0/Gas%20Professionals/Files/Compliance/SCHEDULE%208.doc>).

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3.5 Site survey

Describe the site survey and the route selection for this gas installation. A site line diagram must be provided showing the route, the pipe diameters, the pipe material and location of pipework components. An example is given in **Appendix 6**.

3.6 Risk assessment

This should be prepared in conjunction with AS/NZS ISO 31000 Risk Management – Principles and Guidelines.

High pressure gas installations are generally specified within industrial or commercial situations. It is accepted practice in those environments to assess the risks posed by an installation or modification to an installation by producing a formal risk assessment.

In all cases, Energy Safe Victoria requires a risk assessment to be undertaken of the hazards associated with the proposed gas installation.

Risk assessment involves the establishment of the risk context environment of the high pressure gas installation project then risk identification, risk analysis and risk evaluation.

You need to identify sources of risk and areas of impacts for your installation. Identification should include examination of the knock-on effects of particular consequences. All significant causes and consequences should be considered. During the installation, project hazards and their risks must be monitored, controlled and reviewed in accordance with the risk assessment outcomes to ensure they remain relevant and achieve expected outcomes.

Environment

An example of the risk context environment is the location of the installation, such as in a hospital, a school or in a chemical processing plant. This will have a significant impact on hazards identified and tolerance of risk.

Analyse

Analyse your identified hazards and their potential risks by considering the cause and sources of risk, their positive and negative consequences and the likelihood that those consequences can occur.

Evaluate

Finally evaluate your risk analysis to help you make decisions about which risks need treatment and the priority for treatment implementation.

Examples of some of the potential hazards encountered at the project design and specification stage, for consumer piping, are provided in **Appendix 3**. However this is not a complete list. The installation environment and engineering design considerations will influence the potential hazards and the project risk.

3.7 Check lists and self assessment

The gas installation self assessment process, **Appendix 4**, provides assistance to enable you to identify what is required for your installation. The self assessment process also enables you to

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determine if your proposals include any of those features that need to be explained in greater detail. It is expected that both the design, the physical route and the location at the site will be subject to assessment to AS/NZS/ISO 3100, AS 4041 and AS 2885 as applicable.

3.8 Installation Standards

Energy Safe Victoria must know the Standards and practices you are applying to the construction, inspection, testing, modification or extension of the consumer piping, together with the standards and practices applied to safely commission the gas installation.

A list of Standards and Codes of Practice are provided in **Appendix 5**. Where the preferred Standards are not used it is the responsibility of the gas installer to identify the Standard as applied to each element of the proposal and to justify their use in the particular circumstances.

New or alternative methods and specifications, representing a departure from current accepted practice, will be considered where:

- The proposal is based on the judgment and experience of the responsible gas installer.
- The basis of the design and its functional specification are evaluated in the risk assessment and fully described in the application.
- The methods achieve a level of safety equal to or greater than that specified AS 4041 or AS 2885.

3.9 Welded joints non-destructive testing outline and plan

A suitable written non-destructive testing (NDT) plan needs to be in place before the installation is constructed. The installation must be examined in accordance with the NDT plan.

Typical contents of a written scheme of examination include:

- Identification of the particular pipe lines within the installation.
- Those parts of each pipe line within the installation which are to be examined.
- The nature of the examination required, including the type and extent of inspection and testing to be carried out.

Note: 100% visual inspection by a competent person is required in all cases

- The preparatory work needed for the pipe line to be examined safely (if applicable).

Often a figure of 10% NDT is used for pipe joints. This does not necessarily have any scientific basis but is seen as being a reasonable amount without incurring undue cost. Such an approach is only viable if:

- The results from the 10% inspected can be legitimately extrapolated to the 90% which was not inspected, i.e. if the damage mechanism is equally likely to occur in all of the 100% and if it can be justifiably assumed that if no defects are found in the 10% examined then there will be no defects in the remaining 90%.
- The design review and risk assessment supports this percentage (see AS 4041 clause 1.5.1 for guidance).

Note: For some locations, particularly habitable buildings, ESV would expect 100% NDT.

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3.10 Welding procedure specifications

A welding procedure specification (WPS) is a formal written document that sets out broad guidelines for shop and field welding practices and procedures for fabricators and their welder operators. ESV will use this document to confirm conformance with the appropriate standards.

Welding parameters and ranges are specified in this document and will be used to prepare the associated welding procedure qualification records that ESV will use to ensure the procedure will produce a weld to the required standard.

3.11 Strength and service leak test procedures

All pipework requires a strength test and an initial service leak prior test to being placed into service. The proposed method and procedures developed need to be documented as part of the application.

Testing must be carried out in a safe manner and the installation must be left safe to use. The testing equipment shall be of a sufficient quality and standard to ensure the test is accurate. Typically for strength tests of pipework the test pressure is continually recorded using a calibrated and certified recording device and the results included in the compliance documentation.

Where pipework components are suitable and rated for the test pressure, and onsite fabrication has been used, a combined strength and leak test may be acceptable. Justification of this decision will need to be given in the testing documentation. Typically for pipework volumes over one cubic metre, a 24 hour test is used.

All procedures should cover:

- Site risk assessment and hazard identification, including understanding gas type properties.
- Leakage monitoring and testing.
- Testing medium release area and disposal.
- Adequate supervision and co-ordination.
- Competency of personnel, including contractors.
- Site communication.
- Emergency procedures.

3.12 Purging Procedures

Purge the system of air or test gases using a safe purging procedure. This procedure should cover:

- Site risk assessment and hazard identification, including understanding the properties of the type of gas.
- Gas monitoring.
- Gas release area and use of flares.
- Ignition sources in the vicinity.
- Adequate supervision and co-ordination.
- Competency of personnel including contractors.
- Site communication.

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- Emergency procedures.

3.13 Fit for purpose and hand-over

You must demonstrate to ESV how you will confirm that the installation is fit for purpose and how you will commission and hand-over the gas installation to the user. Your application will need to address:

- Decommissioning existing gas installations.
- Procedures for testing the gas installation.
- Commissioning and purging procedures.
- Commissioning of pipeline components.
- Inspection and test plans including 'hold points' for Energy Safe Victoria inspections.
- Hand-over, user operation and maintenance instructions.

3.14 Engineering design proposal

The engineering design proposal shall detail how the piping shall be designed to withstand the most severe condition likely to occur during the design life, without failure. The design proposal needs to explain:

- The purpose for which the piping is designed.
- The possibility of piping failure under expected service conditions.
- Consequence of failure of piping on human life, property and the environment.
- Proximity of the piping to members of the public and workers.
- Properties of any released gas.
- Pressure energy (pressure multiplied by the volume) of the gas contents of the pipework.
- Service conditions - temperature range, design life and maximum allowable operating pressure for the piping.
- Design life.
- Adequacy of materials (e.g. weldability, corrosive resistance) adequacy of design, fabrication, installation, examination, testing, inspection, protection, operation, and maintenance.
- The effects of the static and dynamic loads and forces such as wind, earthquakes, vibration, cyclic pressure changes, thermal expansion and contraction, hydrostatic testing, settlement, and so on.
- The hazards and any risk, identified and assessed associated with the use of the piping (refer to **Appendix 2, 3 and 4** for guidance).
- Testing or inspections to be carried out on the piping.
- Installation, commissioning, de-commissioning, use, transport, storage and, if the pipework is capable of being dismantled, dismantling of the piping.
- Systems of work and competency of operators necessary for the safe use of piping.
- Emergency procedures required if there is a malfunction of the piping including during testing.

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4 Compliance documentation

General information to be provided in the compliance documentation under Gas Safety (Gas Installation) Regulations and completed by a person considered suitable by ESV (refer to Part 3 Division 5 Regulation 31(6)) shall include:

- A signed Compliance Notice (Schedule 11) - this is part of the ESV Application for Acceptance form originally submitted (see <http://www.esv.vic.gov.au/Gas-Professionals/Gas-installations/Application-forms>).
- “As-built” drawings.
- Material data reports and test certificates for pipes, fittings, components and materials.
- Welding procedures and welder qualification test results.
- Heat treatment reports.
- Weld maps.
- Non-destructive test examination reports for on-site welding and for fabrications.

Note: 100% visual examination is required and ESV may require 100% X-ray or other methods of NDT of welds or a combination of methods unless a specific non-destructive examination plan has been agreed to as part of the Application for Acceptance.

- Strength test report.
- In service gas leak test report.
- Pipework purging and commissioning report.
- Information and drawings relating to any variation from the original application.

5 Compiling your application

Compile information for your application in a format that can be logically and easily followed and provides a summary outlining the information Energy Safe Victoria can expect.

You can make your application to Energy Safe Victoria by providing:

- A paper-based application including all drawings posted or otherwise delivered to Energy Safe Victoria.
- A fully electronic application, including all documents and drawings using common file standards.
- Both paper and electronic combined. In this case the gas installer must clearly indicate to Energy Safe Victoria how the complete information will be provided.
- Application by facsimile is not acceptable.

6 ESV application process

In response to your application, Energy Safe Victoria will provide a reference number for your application, deal efficiently with your application and agree realistic times in which to respond. Incomplete applications will not be processed unless by prior agreement with a gas installer. Clear reasoning and timely notification of non-acceptance will be provided.

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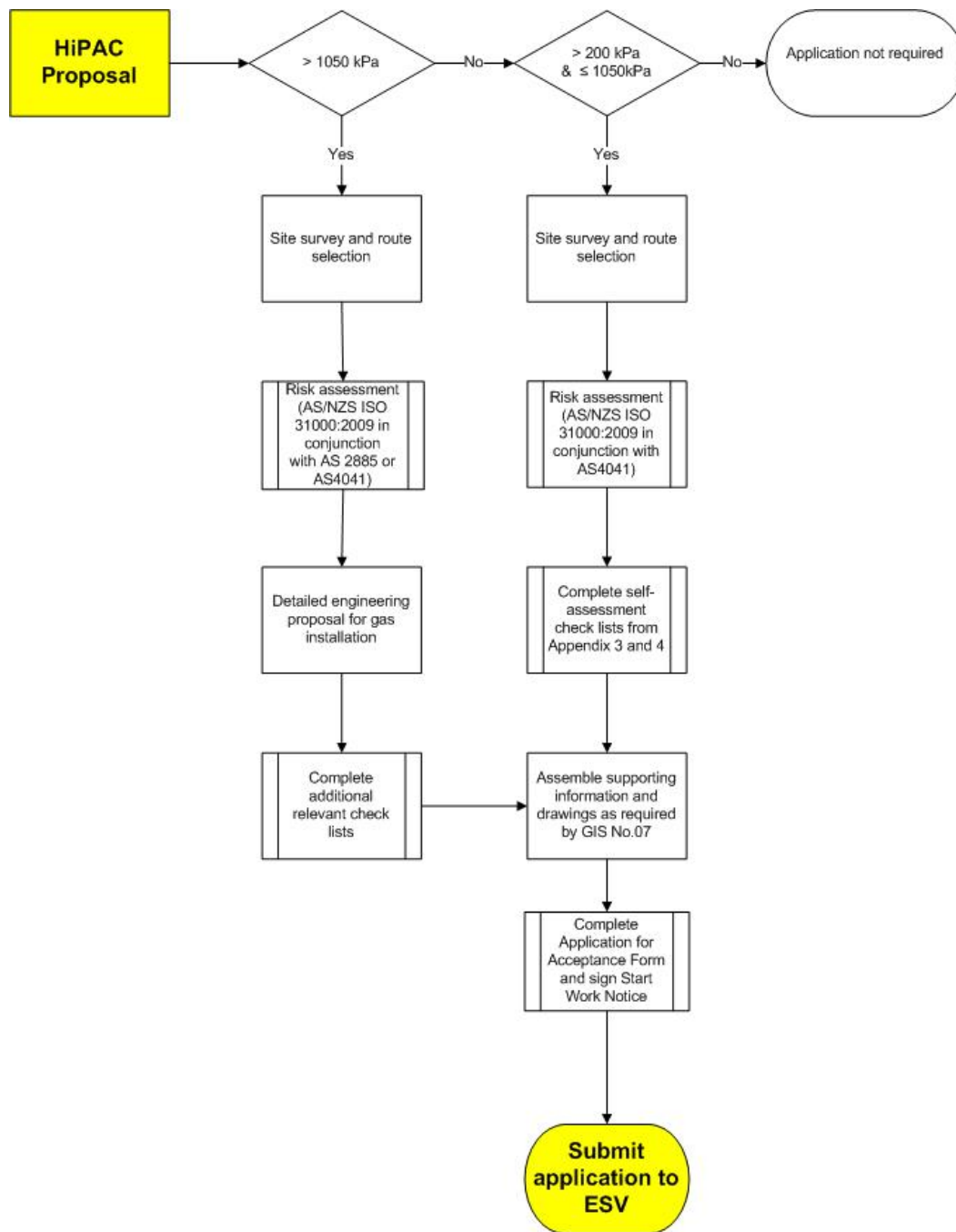
At its discretion Energy Safe Victoria will provide gas installers with the opportunity to respond to a notice of non-acceptance for any part of an application, without re-submission of the whole application.

7 Further information

For further information call the Gas Safety Technical Information Line on 1800 652 563.

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Appendix 1 – Application for Acceptance Process for High Pressure Gas Installations



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Appendix 2 – Application outline – Risk profile

Identify the features of your proposed gas installations

Survey the site or premises and undertake a risk assessment appropriate for the gas installation. Use chart below to identify the characteristics of the gas installation and complete the forms and check lists applicable to your proposal.

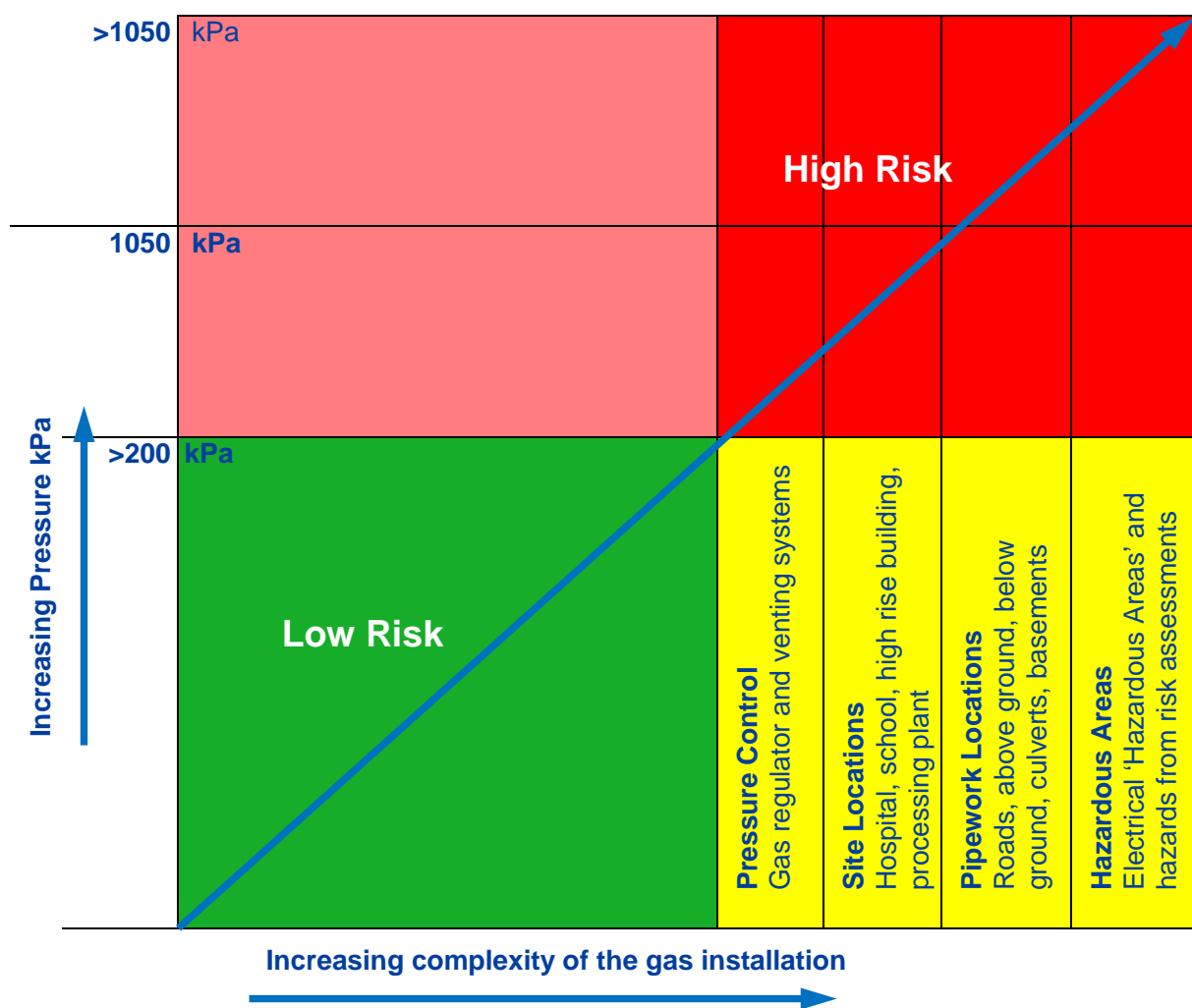


Chart: Characteristics of Complex Gas Installations and potential hazards

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Appendix 3 – An Example Risk Assessment Guide and Check list

Generic hazards (simplified) - Complex Gas Installations (project design and specification stage). Use in conjunction with AS/NZS ISO 31000 - Risk Management and a full assessment for the project.

Installation	Potential risk	Control measures	Residual risk
Pipe above ground	Impact from vehicular traffic		
	Impact from cranes		
	Impact from material transfer systems		
	Fire		
	Vibration		
Pipe below ground	Impact from excavation		
	Impact from directional drilling		
	Impact from boring		
	Abrasion from backfill materials		
	Flooding		
	Damage by other services		
Pipe all locations	Route / Location		
	Earth movement		
	Corrosive or aggressive environment		
	Corrosion: Lack of cathodic protection		
	Corrosion: Failure of cathodic protection system		
	Corrosion: Failure of electrical insulation joints		
	Corrosion: Lack of coating and wrap or painting systems		
	Corrosion: Failure of protection systems		
	Electricity - earth continuity and lightning		
	Leaks		
	Pipeline material failure		
	Pipeline component material failure		
Isolation valves	Valve failure		
	Valve leakage <ul style="list-style-type: none"> • Internal • External 		
	Valve / actuator not accessible		
	Valve function not identified		
Test point, purge and vent valves	Cannot safety commission or recommission (insufficient or no valves)		
	Cannot safety commission or recommission		

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Appendix 4 – Application self assessment forms

Check list 1 – Application attachments

Check list 1	Attachments to support your proposal
This check list is to be completed for all applications exceeding 200 kPa and indicating which attachments have been provided to support your proposal.	

Item	Section	Sub-section	Description	Attachment
1	Risk assessment	Report	Assessment to AS/NZS/ISO 3100, AS 4041 and AS 2885 as applicable	<input type="checkbox"/>
2	Purpose	Description		<input type="checkbox"/>
		Functional specification		<input type="checkbox"/>
3	Gas installation capacity or duty	System pressure design data	Normal, maximum and fault pressures for system	<input type="checkbox"/>
		Design flow rate	For complete system and delivery points	<input type="checkbox"/>
		Design pressure drop	Calculations or network analysis	<input type="checkbox"/>
4	Gas installation materials	Pipe	Pipe sizes and materials	<input type="checkbox"/>
		Valves	Manual isolation valves	<input type="checkbox"/>
			Automatic valves	<input type="checkbox"/>
		Meters		<input type="checkbox"/>
		Corrosion protection		<input type="checkbox"/>
Standards	Material standards	<input type="checkbox"/>		
5	Location	Drawings	Location of proposed installation and components, pipe route	<input type="checkbox"/>
		Specific detail	Pipeline components	<input type="checkbox"/>
			Buried pipe, above ground pipe, pipe bridges or gantries	<input type="checkbox"/>
			Separation of services	<input type="checkbox"/>
6	Construction and procedures	Connection to pipe system	Connection	<input type="checkbox"/>
			Termination	<input type="checkbox"/>
		Joining systems	Welding standards and procedures, welder testing and qualifications	<input type="checkbox"/>
		Pipe support systems	Proprietary systems	<input type="checkbox"/>
			Self constructed supports	<input type="checkbox"/>
		Directional drilling	Machine location	<input type="checkbox"/>
			Utility and services plans	<input type="checkbox"/>
		Pipeline protection	Coating and Wrap, paint systems	<input type="checkbox"/>
			Holiday testing	<input type="checkbox"/>
		Pipeline identification	Identification systems	<input type="checkbox"/>
		Cathodic protection	Anodes and test posts	<input type="checkbox"/>
		Electrical connection	Arrangements for hazardous zones	<input type="checkbox"/>
		Earth continuity	Earthing and Insulation	<input type="checkbox"/>
Standards	Construction standards	<input type="checkbox"/>		
7	Specific procedures	De-commissioning	Procedures and apparatus	<input type="checkbox"/>
		Test schedules	Standards and test equipment used. Inspection and test plans, NDT results, radiography, and so on. Hydrostatic and pneumatic testing	<input type="checkbox"/>
		Commissioning	Procedures and apparatus, e.g. purging	<input type="checkbox"/>

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Appendix 4 - Application self assessment forms

Check list 2 – Specific site hazards

Check list 2	Applications featuring specific site hazards
This check list is to be completed for applications featuring specific site hazards identified through site survey and risk assessment and indicating which attachments have been provided to support your proposal.	

Item	Section	Sub-section	Description	Attachment
1	Crossing hazards	Road crossing	Buried pipe	<input type="checkbox"/>
			Bridge or gantry	<input type="checkbox"/>
		Open drain or waterway	Buried pipe	<input type="checkbox"/>
			Bridge or gantry	<input type="checkbox"/>
		Culverts, and so on	Over - reduced depth	<input type="checkbox"/>
			Under - deep excavation	<input type="checkbox"/>
		Ducts High voltage electrical cables Other services	Separation	<input type="checkbox"/>
			Contaminated ground	<input type="checkbox"/>
2	Proximity hazards	Corrosive or aggressive soils		<input type="checkbox"/>
3	Ground hazards	Unstable ground		<input type="checkbox"/>
		Corrosive environment		<input type="checkbox"/>
		High or low temperature		<input type="checkbox"/>
4	Local atmosphere hazards	Impacts	Vehicular traffic	<input type="checkbox"/>
		Specific detail	Cranage	<input type="checkbox"/>
5	Location hazards	Flammable liquid or gas storage	Material transfer systems	<input type="checkbox"/>
		High voltage transformers		<input type="checkbox"/>
				<input type="checkbox"/>
6	Other	Hospital		<input type="checkbox"/>
		Education facility		<input type="checkbox"/>
		High rise building		<input type="checkbox"/>
		Major sports facility		<input type="checkbox"/>
		Major hazards facility		<input type="checkbox"/>
				<input type="checkbox"/>
				<input type="checkbox"/>
				<input type="checkbox"/>
				<input type="checkbox"/>
				<input type="checkbox"/>
				<input type="checkbox"/>

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Appendix 4 - Application self assessment forms

Check list 3 – Hazardous areas

Check list 3	Hazardous areas
Classification of hazardous areas – Flammable gases as per AS/NZS 60079.10.1	
This check list is to be completed for applications where an assessment has determined hazardous areas are involved and must indicate which attachments have been provided to support your proposal.	

Item	Section	Sub-section	Description	Attachment
1	Hazardous area	Area classification	Zone 0	<input type="checkbox"/>
			Zone 1	<input type="checkbox"/>
			Zone 2	<input type="checkbox"/>
		Gas classification	Group 11A	<input type="checkbox"/>
			Group 11B	<input type="checkbox"/>
			Group 11C	<input type="checkbox"/>
		Method of protection	Flameproof	<input type="checkbox"/>
			Increased safety	<input type="checkbox"/>
			Intrinsic safety	<input type="checkbox"/>
			Zener barriers	<input type="checkbox"/>
2	Equipment connected			<input type="checkbox"/>
				<input type="checkbox"/>
3	Drawings			<input type="checkbox"/>

Generally, with some exceptions, consumer gas installations complying with AS/NZS 5601 Gas Installations and AS 3814 Industrial and commercial gas appliances and operating at not more than 200 kPa are considered non-hazardous (refer to AS 60079.10.1 Explosive atmospheres - Classification of areas - Explosive gas atmospheres, Appendix ZA 6.2.1 for Consumer Gas Installations).

Above 200 kPa and up to 1050 kPa an assessment should be done.

Over 1050 kPa the owner or operator must have carried out a full assessment and ensure that zoning appropriate to the pressures and capacity of the installation have been applied.

Note 1: Under some circumstances, particularly in confined spaces, caution should also be taken with small quantities of flammable gases as these may give rise to hazardous areas.

Note 2: The exemption for gas appliances and equipment covered by gas industry codes is based on the argument that these codes provide, by equipment design and instructions, an installation that produces a non-hazardous environment. In some instances, particularly for larger industrial equipment, the installer needs to ensure that this argument is justified.

Under section 7.7.2 of the AS/NZS 3000:2007 Electrical installations (known as the Australian/New Zealand Wiring Rules), the responsibility for classification of a hazardous area rests with the persons or parties in control of the installation. Through design and operation, it is possible to reduce the degree of hazard. This is achieved by giving attention to items such as plant layout, product containment and ventilation.

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Appendix 4 - Application self assessment forms

Check list 4 – Pressure control and venting

Check list 4	Pressure control and venting systems
<p>This check list is to be completed for applications featuring pressure control regulators and venting systems within consumer piping. This check list is not to be completed for gas distribution business regulators upstream of consumer piping or for pressure regulators or venting systems downstream of appliance isolation valves that form part of a Type B gas appliance. Indicate which attachments have been provided to support your proposal.</p>	

Item	Section	Sub-section	Description	Attachment
1	Design flow rate (Q m ³ h ⁻¹)	Qmin		<input type="checkbox"/>
		Qmax	Percentage droop at Qmax	<input type="checkbox"/>
		Qmin		<input type="checkbox"/>
2	System pressures	Normal - upstream		<input type="checkbox"/>
		Fault - upstream		<input type="checkbox"/>
3	Regulator(s) pressures	Regulator	Set point	<input type="checkbox"/>
		Overpressure / Slam shut	Set point	<input type="checkbox"/>
		Active regulator (single/lead stream)	Active – Set point	<input type="checkbox"/>
		Monitor regulator (single/lead stream)	Monitor – Set point	<input type="checkbox"/>
		Active regulator (Stand-by stream)	Active – Set point	<input type="checkbox"/>
		Monitor regulator (Stand-by stream)	Monitor – Set point	<input type="checkbox"/>
		Regulator 'Lock-up'		<input type="checkbox"/>
		Relief regulators	Relief - Set point	<input type="checkbox"/>
4	Ancillary systems	Lock-up systems		<input type="checkbox"/>
		Stream selection		<input type="checkbox"/>
5	General arrangement	Drawings	Pipe systems	<input type="checkbox"/>
			Control pipe work	<input type="checkbox"/>
			Control elements	<input type="checkbox"/>
			Vent pipe work and terminations	<input type="checkbox"/>
6	Regulator manufacturer	Information sheets		<input type="checkbox"/>
		Performance charts		<input type="checkbox"/>
7	Commissioning	Commissioning programme		<input type="checkbox"/>
		Valve identification		<input type="checkbox"/>
8	Protection	Security		<input type="checkbox"/>
		Barriers		<input type="checkbox"/>
		Notices		<input type="checkbox"/>

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Appendix 5 – Representative published technical standards relevant to gas installations

National Standards	Standard No.	Title
SAI Global Tel: 131 242 Fax: 1300 654 949 www.saiglobal.com sales@saiglobal.com	AS 1345	Identification of the contents of pipes, conduits and ducts
	AS 1596	Storage and handling of LP Gas
	AS 2129	Flanges for pipes, valves and fittings
	AS 2700	Colour Standards for general purposes
	AS 2832.1	Cathodic protection of metals - Pipes and cables
	AS 2885.0	Pipelines – Gas and liquid petroleum – General Requirements
	AS 2885.1	Pipelines – Gas and liquid petroleum – Design and construction
	AS 2885.2	Pipelines – Gas and liquid petroleum – Welding
	AS 2885.3	Pipelines – Gas and liquid petroleum – Operation and Maintenance
	AS 2885.5	Pipelines – Gas and liquid petroleum – Field Testing
	AS 3788	Pressure Equipment – In Service Inspection
	AS 3814	Industrial and commercial gas-fired appliances
	AS 3873	Pressure equipment – Operation and maintenance
	AS 4041	Pressure piping
	AS 4130	Polyethylene (PE) pipes for pressure applications
	AS 4131	Polyethylene (PE) compounds for pressure pipes and fittings
	AS 4343	Pressure Equipment – Hazard Levels
	AS 4617	Manual shut off gas valves
	AS 4623	Jointing compounds and materials for use in gas pipe joints
	AS 4629	Automatic shut off valves and vent valves
	AS 4631	Limited flexibility connectors for gas
	AS 4799	Installation of underground utility services and pipelines within railway boundaries
	AS/NZS 5601	Gas Installations
	AS ISO 7.1	Pipe threads where pressure-tight joints are made on the threads - Dimensions, tolerances and designation
	AS ISO 6993.1	Buried, high-impact poly(vinyl chloride) (PVC-HI) piping systems for the supply of gaseous fuels - Pipes for a maximum operating pressure of 1 bar (100 kPa) (ISO 6993-1:2006, MOD)
	AS ISO 6993.2	Buried, high-impact poly(vinyl chloride) (PVC-HI) piping systems for the supply of gaseous fuels - Fittings for a maximum operating pressure of 200 mbar (20 kPa)
	AS ISO 6993.3	Buried, high-impact poly(vinyl chloride) (PVC-HI) piping systems for the supply of gaseous fuels - Fittings and saddles for a maximum operating pressure of 1 bar (100 kPa)
	AS/NZS 1477	PVC pipes and fittings for pressure applications
	AS/NZS 4645.2	Gas distribution networks - Steel pipe systems
	AS/NZS 1869	Hose and hose assemblies for LP Gas, natural gas and town gas
	AS/NZS 2648.1	Underground marking tape – Non-detectable tape
	AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
	AS/NZS 4645.3	Gas distribution networks - Plastics pipe systems
	AS/NZS 4645.2	Gas distribution networks - Steel pipe systems
AS/NZS ISO 31000:2009	Risk management - Principles and guidelines	
AS/NZS 60079.10.1	Explosive atmospheres - Classification of areas - Explosive gas atmospheres (IEC 60079-10-1, Ed.1.0(2008) MOD)	

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International Standards - USA	Standard No.	Descriptive Title
American National Standards Institute www.ansi.org	B1.20.1	Pipe threads, general purpose (inch)
	B16.5	Pipe flanges and flanged fittings
	B16.9	Factory-made wrought steel butt-welding fittings
	B16.11	Forged fittings, socket-welding and threaded
	B16.33	Manual operating metallic gas valves for use in gas piping systems to 125 psig
	B31.1	Power Piping
	B31.3	Process Piping
	B31.8	Gas Transmission Piping
ASTM International Formerly known as the American Society for Testing and Materials www.astm.org	A106	Standard specification for seamless carbon steel pipe for high temperature service
	A269	Standard specification for seamless and welded austenitic stainless steel for general service
	D2513	Standard specification for thermoplastic gas pressure pipe, tubing and fittings
	A53/A53M	Specification for pipe, steel, black and hot-dipped zinc coated welded and seamless

International Standards - UK	Standard No.	Descriptive Title
Institution of Gas Engineers and Managers www.igem.org.uk Charnwood Wing Ashby Road Loughborough Leicestershire LE11 3GR Tel: 01509 282728 Fax: 01509 283110 E-mail: general@igem.org.uk	IGEM/TD/1	High Pressure Pipelines >16 bar
	IGEM/TD/2	Pipeline Risk Assessment
	IGEM/TD/3	Distribution Mains <16 bar
	IGE/TD/12	Stress Analysis
	IGEM/TD/13	Pressure regulating installations for transmission and distribution systems
	IGE/GM/4	Flow metering practice for pressures between 38 and 250 bar
	IGE/SR/18	Safe working practices to ensure the integrity of gas pipelines and associated installations
	IGE/SR/22	Purging operations for fuel gases in transmission, distribution and storage
	IGE/SR/23	Gas Venting
	IGE/SR/24	Risk Assessment Techniques
	IGE/SR/25	Hazardous Area Classification
	IGE/UP/1	Strength and tightness testing and direct purging of industrial and commercial gas installations
	IGE/UP/2	Gas installation pipe work, boosters and compressors on industrial and commercial premises (Commentary: For pipe systems not exceeding 7 bar – [700 kPa])
	IGE/UP/16	Design for Natural Gas installations on industrial and commercial premises with respect to hazardous area classification and preparation of risk assessments

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International Standards – ISO	Standard No.	Descriptive Title
International Standards Organisation http://www.iso.org/iso/home/store/catalogue_ics.htm	ISO 15649	Petroleum and Gas Industry Piping

International Standards – EN	Standard No.	Descriptive Title
European Standards http://www.cenorm.be/catweb/cwen.htm	EN 1775	Gas Supply – Gas Pipework for Buildings - ≤ 5 bar
	EN 13480	Industrial Piping
	EN 15001	Gas infrastructure. Gas installation pipework with an operating pressure greater than 0,5 bar for industrial installations and greater than 5 bar for industrial and non-industrial installations.

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Appendix 6 – Example of Consumer Piping Installation Line Diagram

Show all pipework in excess of 200 kPa (including all pipe work 25 mm diameter and greater)

