

Final Plan Attachment 8.6 V49 Supporting Information 2

Business Cases

GPI Safety Management Report 2014/15 Non-
Licenced Gas Infrastructure

December 2016

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GPI Safety Management Report 2014/15 – Non-licensed Gas Infrastructure

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Structure of the report

Section 1: Introduction provides information about the Non-licensed Gas Infrastructure Industry Group and changes that occurred throughout the year.

Section 2: Monitoring, auditing and inspections discusses ESV's activities and findings from monitoring the existence and efficacy of threat-barriers, including basic safety framework documentation, self-reporting and key performance indicators, and audit outcomes.

Section 3: Acceptances and approvals reports on the status of safety framework documentation (Safety Case) submissions and approvals and highlights any emerging issues.

Section 4: Education and partnerships discusses ESV's collaborative engagements with industry and the community to address emerging risks and facilitate safety outcomes via education and partnerships.

Section 5: Compliance and enforcement provides information about ESV's Compliance and Enforcement Policy and Compliance Strategy as well as any compliance and enforcement activities ESV was required to undertake.

Section 6: Focus and priorities for 2015/16 discusses those areas within the industry group ESV intends to prioritise for the coming year.

Appendix A shows the industry group's threat-barrier diagrams to manage loss-of-containment risks.

1. Introduction

The Gas & Pipeline Infrastructure (GPI) Safety Management Report 2014/15, Non-licensed Gas Infrastructure should be read in conjunction with the GPI Safety Management Report 2014/15, Executive Briefing, which provides information about ESV's effectiveness in delivering safety and risk-based regulation, the latest findings from ESV's prioritisation of concerns, and an overview of ESV's related roles, responsibilities, scope, and focus.

1.1. Focus and priorities during 2014/15

During 2014/15, ESV focused on closing any outstanding audit actions from 2013/14 through verification and conducting a new natural gas mains renewal field audit program.

During the year, there was a substantial consolidation of the LPG industry in Victoria, and ESV's priority for the industry group has been to update any remaining Safety Cases to:

- accurately reflect changes in facility descriptions
- ensure they conform with a single safety management system and not a hybrid incorporating legacy practices from previous facility owners.

1.2. The Non-licensed Gas Infrastructure Industry Group

The Non-licensed Gas Infrastructure Industry Group, involving natural gas distribution, reticulated LPG and LPG retail, landfill biogas and LNG, comprises companies that operate:

- the distribution networks that reticulate natural gas supplied from the transmission system to customers and distribution pipelines
- landfill and biogas pipelines from capture points to power generation facilities
- LPG reticulation networks supplying gas to small communities and subdivisions
- storage and handling facilities at LPG depots
- LNG off-network supplies to customers at dedicated industrial and commercial sites.

Table 1-1 lists the organisations in this industry group¹.

Table 1-1 - Non-licensed Gas Infrastructure

Natural gas distribution
AusNet Gas Services Pty Ltd
Australian Gas Networks Limited (operated by APA Networks)
Multinet Gas Distribution Partnership ¹
Reticulated LPG

¹ These names are accurate as at 1 July 2015.

AusNet Gas Services Pty Ltd
Elgas Ltd
Indigo Shire Council
Mount Hotham Alpine Resort Management Board
Westernport Region Water Corporation
Landfill biogas and LNG
AGL Energy Sales & Marketing Limited ²
City of Whittlesea
Clean Energy Distribution Pty Ltd
Energy Developments Limited
LPG retailers
Elgas Ltd
Origin Energy (LPG) Limited
Supagas Pty Ltd
Vic LPG
Notes:
1. Combined Multinet Gas Distribution Partnership and MG (DB No. 1) and MG (DB No. 2) are shown here for reporting purposes.
2. Last year, this was reported as AGL Werribee Gas. This change reflects its presentation of its own Safety Case.

See Appendix A (Figure 7-1, Figure 7-2, and Figure 7-3) for an illustration of this industry group's threat barriers².

1.3. Non-licensed Gas Infrastructure Industry Group changes

Changes to the Non-licensed Gas Infrastructure Industry Group's licence holders since the last GPI Safety Management Report include the following:

- Australian Gas Networks Ltd (operated by APA Networks) is the regulated entity (formerly Envestra Limited).
- Origin Energy (LPG) Limited and Elgas Ltd are the regulated entities (formerly Kleenheat Gas) (Victorian operations only).
- Supagas Pty Ltd is the regulated entity (formerly Dandenong LPG Pty Ltd).

² These threat barrier diagrams are illustrative of the range of issues that need to be managed across the industry group. They should not be taken as definitive or in any way limiting the issues that each organization should consider.

2. Monitoring, auditing and inspections

2.1. ESV audits

2.1.1. Compliance documentation

Regulated entities are required to have a range of up-to-date compliance documents³ that detail the entity's Safety Case framework. These documents provide the basis for the implementation and maintenance of an entity's threat barriers and the benchmark for ESV's ongoing compliance audits.

Compliance requirements specific to this industry group include:

- Safety Cases
- as-built drawings and Route Plans
- Formal Delegations⁴
- Asset Management Plans
- Emergency Response Plans
- Environmental Management Plans
- registration/procedures for Dial Before You Dig⁵.

2.1.2. Audit plans

ESV audit plans are designed to confirm the existence and effectiveness of threat barriers by testing compliance with Safety Cases and are established in accordance with the risk-based strategic audit framework.

High-level audit findings are categorized in one of two ways:

- 'Observations' represent an isolated lapse or failure to comply with a specified requirement with the potential to lead to non-conformance and must be addressed within two months.
- 'Non-conformances' represent a failure to comply with specified requirements and must be addressed immediately or as otherwise agreed with ESV.

As per ESV's audit practice:

- Auditees must provide formal notification when all audit findings have been addressed.

³ Legislation and Standards require the revision of Safety Cases, (including Asset Management Plans, Emergency Response Plans and Environmental Management Plans) at least every five years (minimum) to the satisfaction of ESV.

⁴ The person responsible for the operation of a facility as declared under the Gas Safety Act or as licensed under the Gas Industry Act.

⁵ Landfill biogas, natural gas and LPG reticulation networks are only required to register as a member with Dial Before You Dig and follow its third-party response requirements where the assets are not fully contained within a private property.

- An audit remains open until ESV is satisfied that the auditee has adequately addressed the audit findings.

2.1.3. Compliance audits

Compliance audits are systematic reviews of an entity's safety management framework, and are designed to ensure compliance with specific legislative clauses and Australian Standards.

ESV did not conduct any compliance or electronic audits on regulated Non-licensed Gas Infrastructure entities in the 2014/15 reporting period. The strategic audit planning process identifies ESV's prioritisation of focus, which in turn underpins the annual audit plan and associated resource allocation.

2.1.4. Verification audits

ESV undertook nine verification audits following the 2013/14 audit program (covering LPG reticulation and meter room audits).

Where necessary, ESV may conduct a verification audit to ensure audit findings have been satisfactorily addressed. Alternatively, submitting evidence to justify the closure of an audit may be deemed sufficient.

LPG reticulation audits

Table 2-1 lists the status of reticulated LPG audits from the 2013/14 reporting period. ESV continues to seek confirmation that audit findings have been satisfactorily addressed.

Table 2-1 – LPG reticulation audit status

Regulated entity	Audit title	Non-conformances	Observations	Status
DP01	██████ Field Compliance Audit	16	41	Closed
DP03	Field Compliance Audit	0	36	Closed
DP04	██████ Field Compliance Audit	13	25	Incomplete
DP05	██████ Field Compliance Audit	- ¹	- ¹	Closed
DP06	██████ Field Compliance Audit	0	29	Incomplete

Notes:

1. This audit's findings were not categorised to differentiate between non-conformances and observations.

Meter room audits

Table 2-2 lists the status of meter room audits that began in 2012. ESV continues to seek validation to ensure audit finding rectifications are completed.

Table 2-2 – Meter room audit status

Regulated entity/industry segment	Sites audited	Key outstanding issues	Status
DG01	11	Relocation of assets to ensure location of buried services is compliant	Incomplete
DG02	15	Ineffective ventilation Poorly maintained and identified emergency isolation valve Ineffective access arrangement Poor labelling and warning signage	Incomplete
DG03	11	-	Closed

In 2012, ESV undertook 15 audits of gas meter rooms owned and operated by DG02. Following completion of the audit program, ESV met with DG02 on 22 February 2013 and was provided with a rectification plan. This plan expired in March 2013, and no formal notification has been provided by DG02 advising of the close out of the audit findings. As per audit practice, formal notification is required before an audit can be considered for closure. This audit remains open until formal notification from DG02 is provided and, if deemed necessary, ESV undertakes further verification.

In 2013, ESV undertook 11 audits of gas meter rooms owned and operated by DG03. Following validation audits in 2014 and early 2015, the audit findings were found to have been rectified and the audit was closed.

In 2014, ESV undertook 11 audits of gas meter rooms owned and operated by DG01. DG01 has advised that it is in the process of closing out the audit findings. Major issues that remain outstanding include the relocation of assets to ensure the location of buried services is compliant. ESV is waiting for formal notification from DG01 prior to considering whether it will undertake any gas meter room verification audits.

2.1.5. Field audits

ESV focused its Non-licensed Gas Infrastructure field compliance audit program on mains renewal practices, which involved the three natural gas distribution business mains renewal programs.

Mains renewal audits

Table 2-3 lists the audits carried out and the number of non-conformances and observations found.

Table 2-3 – Mains renewal audits

Regulated entity	Non-conformances	Observations
DG01	36	12
DG02	23	10
DG03	26	8

The findings from mains renewal audits revealed a number of common areas of concern:

- Training and competency.
- Occupational Health and Safety (OH&S) practises.
- Contractor management.
- Non-compliant work practises with respect to mains renewal (for example, failure to install and test the continuity of tracer wire, use line up clamps for jointing, correctly stop gas flow, and not having gas detection equipment on site).

2.1.6. Responses to audit

Mains renewal audits

ESV will continue to audit this area, concentrating on safety processes and systems, and where necessary will engage with organisations at the CEO level to facilitate a full understanding of any shortfalls in the organisation's capability or willingness to address safety issues.

Worksite attendance

ESV is seeking a greater level of co-operation when its inspectors attend construction and operational worksites. Examples of the problems being encountered include not

providing inspectors with drawings in preparation for a site inspection (despite being given advance notice), and requiring specialised personal protection equipment (PPE) without making on-site provision or providing ESV with advance notice of the requirement.

While always working to liaise with licensees and gas companies, and complying with induction requirements and other site access conditions wherever possible, licensees and gas companies are reminded that all ESV inspectors have a right of access to worksites (where, in the inspector's opinion, safety or accepted Safety Case compliance is an immediate issue of concern), and owners are encouraged to enable access in any way possible.

Inspectors are assigned to determine compliance with the relevant Acts, Regulations, Safety and Environmental Management Plans and other related subordinate or referenced plans and standards, and are appointed under the Pipelines, Gas Industry and Gas Safety Acts.

A person or body corporate who obstructs or hinders an inspector without reasonable excuse commits an offence under Section 103 of the Gas Safety Act.

2.2. Compliance documentation, self-reporting and KPIs

ESV has agreements with the entities it regulates (underpinned by legislated requirements) to provide safety-related information, typically covering:

- mains renewal programming and progress
- incident statistics, including reports of damage to infrastructure, near misses, and interruptions to supply
- inspections, audits, and unauthorised third-party encroachment
- regular periodic compliance reporting.

This information helps to demonstrate compliance with legislation and standards as well as identifying potential improvement from gas companies for dealing with actual incidents. For information about serious incident investigations that may lead to enforcement action, see Section 5.1.

2.2.1. Incident statistics

Third-party damage

This year's incident statistics are consistent with the findings from 2013/14. With 227 gas mains and 2996 gas services damaged by third-party civil works in 2014/15, there has been no noticeable reduction in the number of mains and services being damaged. ESV is conscious that gas companies have not been able to reduce this outcome and associated risk.

Figure 2-1 and Figure 2-2 show the damage trends for both mains and services since 2011/12, which indicates that work by gas companies in this area is having little or no impact.

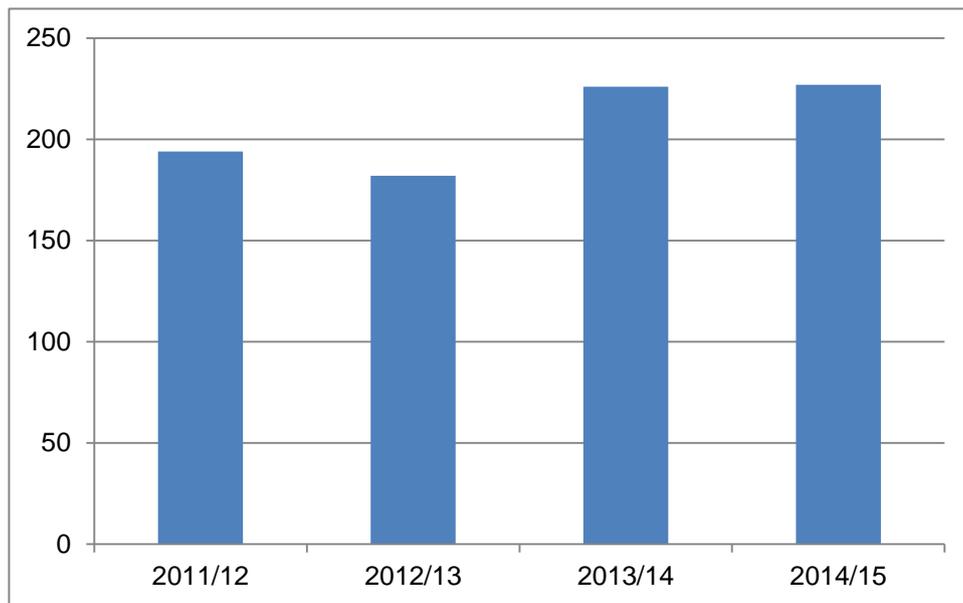
Damage to mains

ESV has identified several issues that are contributing to the problem of damaged mains, including:

- inaccurate or inadequately detailed As-Built Drawings
- a lack of hand proving⁶ to confirm the exact location of assets
- a difficulty obtaining timely confirmation from asset owners about the location of assets.

There also appears to be a general misconception that a response from an inquiry to the Dial Before You Dig service represents a tacit approval to commence work in the vicinity of gas infrastructure. This is not the case and specific approval is needed from the gas asset owner.

Figure 2-1 - Damaged mains (less than 1050 kPa) since 2011/12



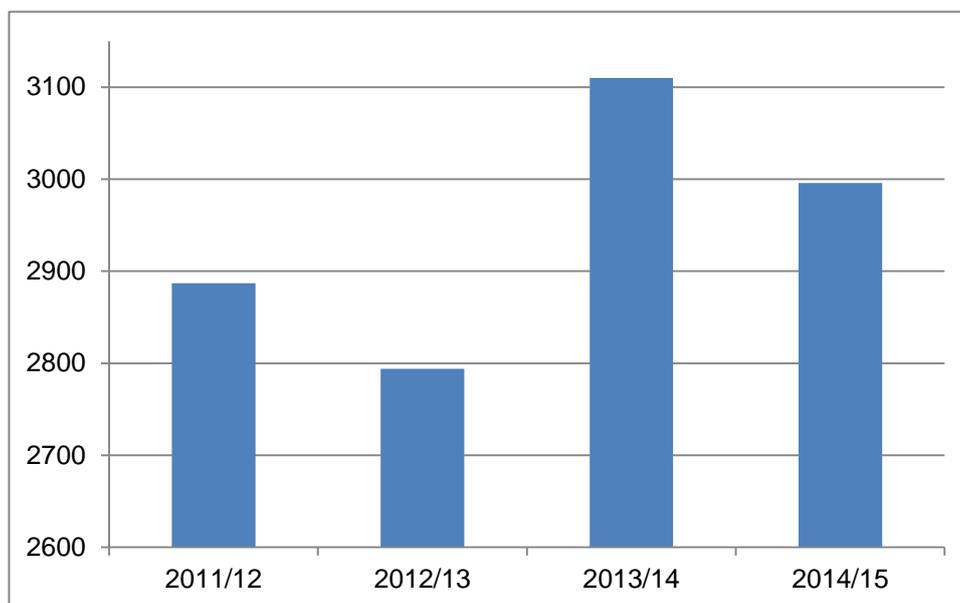
Damage to services

The number of damaged services remains higher than the rolling previous three year average of 2930. ESV audits revealed what could be contributing factors for the high number of incidents involving services, which include:

- no recording of as-built services on drawings
- poor work practices when installing a service (for example, not meeting the minimum depth of cover or clear separation requirements)
- not ensuring the installation of tracer wire on non-metallic pipes
- the continuity testing of tracer wires not being conducted when installed.

Coupled with this, ESV considers drawings that omit services to be a lost opportunity to ensure a further level of asset protection.

⁶ Excavating around a pipeline without the use of machinery.

Figure 2-2 - Damaged services (less than 1050 kPa) since 2011/12

National gas competency training

Any breach of Clause 36 of the Gas Safety (Safety Case) Regulations is a breach under the legislation, and gas companies are liable for ensuring a minimum level of competency for work on their assets.

ESV's mains renewal program audits found inconsistencies among the natural gas distribution companies when it came to ensuring that contractors undertake the minimum national gas competency training required for personnel to conduct works on natural gas distribution assets.

(DG04 is the only [REDACTED] natural gas distribution company that confirmed it does not insist on national gas competency training as a mandatory minimum training requirement for its field work force.)

Following the disaggregation and privatization of the former Gas and Fuel Corporation of Victoria (GFCV), the Office of Gas Safety (ESV's predecessor) entered into an agreement with the Victorian Natural Gas Industry Distributors (Multinet Gas, Stratus Networks, and Westar) to recognise the strategic importance of developing and maintaining the competencies of both staff and contractors undertaking work on natural gas infrastructure.

This agreement:

- aimed to mitigate risk and ensure adequate safety (of both people and equipment) and infrastructure integrity
- aimed to ensure distributor conformance with the obligations set out in their Safety Cases
- required implementation of the Australian National Training Authority-endorsed national competency standards and Victorian gas industry-specific competencies.

Critical to ensuring the safe, efficient and effective delivery of natural gas and for the management of the asset base in Victoria, ESV is increasingly concerned to see that this agreement is honored.

In ESV's view, all natural gas distribution companies should be undertaking national competency training with accredited RTOs. ESV is investigating the currency and

appropriateness of training certificates presented by field staff and contractors where ESV has not been satisfied that certificates are being provided by RTOs approved to certify that particular module of national gas competency training.

There are currently no national standards of competency for the LNG and LPG industries in Victoria, but advances have been made within the Australian Qualifications Framework (AQF) to address these specific competencies, and ESV will continue to progress this with the affected regulated entities.

Loss of supply

There were 76 incidents of a loss of supply (due to third-party damage) that affected more than five customers. This is higher than the three year average. This situation is unacceptable, and ESV will continue to pursue gas companies to arrest and reverse this increasing third-party damage trend.

2.2.2. Emergency response exercises

Regulated entities are required to conduct Emergency Response Exercises (as detailed in the agreed Key Performance Indicator (KPI) reporting template), and (where required) ESV will seek a copy of the Emergency Response Exercise report for its review.

Following the identification of certain deficiencies, ESV has increased its assessment and scrutiny of Emergency Response Exercises and is pursuing the following assurances:

- Operational competencies are demonstrable with regard to industry involvement through exercises conducted by the Gas Emergency Management Consultative Forum (GEMCF).
- Emergency Response Exercises (and any supporting material) will reflect a realistic gas industry/pipeline incident event that tests response and recovery protocols.
- Responsible persons, as identified by the accepted Emergency Response Plan, will be directly involved in the exercise.
- Emergency exercise reporting will identify lessons learnt and include recommendations (and any actions that will need to be taken) to ensure ongoing improvement.

2.2.3. Mains renewal program statistics

In collaboration with the Australian Energy Regulator (AER), ESV is monitoring the progress of the current natural gas distribution business mains renewal program (from 2013 to 2017), and is in the process of establishing whether these businesses are focusing on the replacement of assets they undertook to replace in submissions to the AER.

During 2014/15:

- DG02 renewed █████ kilometres of gas mains, achieving a monthly average of █████ kilometres
- DG01 renewed █████ kilometres of gas mains, achieving a monthly average of █████ kilometres
- DG03 renewed █████ kilometres of gas mains, achieving a monthly average of █████ kilometres.

The statistics being reported to ESV demonstrate an increase in the total kilometres of mains renewal undertaken in 2014/15 compared to 2013/14, with 396 kilometres of mains renewed this financial year (compared to 332 kilometres last financial year).

As forecast in the 2013/14 Performance Safety Report, ESV undertook a detailed examination of the mains renewal practices of each natural gas distribution business.

Audits found differences between mains laying procedures and the mains laying practices of contractors (see also Section 2.1.5).

ESV is concerned about the level of transparency involving the distribution business mains renewal program, and is seeking the validity of the mains renewal program progress statistics provided through self-reporting. ESV has also found it difficult to form a consistent view of the actual replacement activity due to inconsistencies in consecutive sets of monthly data, making it very difficult to track the program's progress with certainty.

2.2.4. Periodic compliance reporting

Agreements are in place with various regulated entities from a number of relevant industry segments for the periodic submission of key performance indicator (KPI) reports. KPI reports are expected to be submitted to ESV within 20 days from the end of the quarter.

Table 2-4 lists the regulated entities that were late to submit KPI quarterly reports on more than one occasion during the 2014/15 financial year.

Table 2-4 – Periodic KPI quarterly report late submissions

Regulated entity/industry segment
Natural gas distribution
DG01
Reticulated LPG
DP05
DP06
Landfill biogas and LNG
DN02
LPG retailers
N/A

3. Acceptances and approvals

3.1. Safety Management Plan and Safety Case acceptance

Legislation requires Safety Cases to be revised at least every five years (at a minimum) to the satisfaction of ESV. In most cases, new entrants and existing companies work closely with ESV to ensure the content and quality of their submissions are appropriate for a particular facility, significantly reducing the number of re-submissions required before acceptance is given⁷.

Table 3-1 lists the Safety Cases due (or overdue) for submission to ESV (as at 1 January 2016).

Table 3-1 – Safety Case acceptance (Non-licensed Gas Infrastructure)

	Date last accepted	Next revision submitted	Overdue for acceptance ¹
Natural gas distribution			
DG01	19-Dec-2006 ²	Yes	Yes
DG03	24-May-2010	Yes	Yes
DG02	02-Aug-2010	Yes	Yes
Reticulated LPG			
DP05	24-May-2010	Yes	Yes
DP04	14-Oct-2013	No	No
DP06	19-Feb-2014	No	No
DP03	25-Feb-2014	No	No
DP01	23-Jan-2015	No	No
Landfill biogas and LNG			
DN03	17-Jan-2013	No	No
DN01	31-May-2013	No	No
DN02	17-Apr-2014	No	No
DN04	12-Nov-2015 ³	No	No
LPG Retailers			
RP01	23-Apr-2009	Yes	Yes
RP02	18-Dec-2012	Yes	No
RP04	20-Jun-2013	No	No
RP03	14-Oct-2013	No	No

Notes:

- Submitted documents may not have been accepted for a range of different reasons, from ESV not yet having reviewed the submission, through to deeming the submission unacceptable.
- Acceptance of the revised Safety Case has been a matter of review since February 2012.
- Originally operating under RG08's Safety Case, DN04 has now submitted separate compliance documentation for a biogas facility.

3.1.1. Safety Case issues

⁷ Gas companies declared under Section 5 of the GSA or that hold a licence issued to a gas company within the meaning of the GIA should be familiar with ESV's 2012 guidelines for preparing a Safety Case.

ESV continues to remind entities with Safety Cases accepted under the Gas Safety Act 1997 about their obligations to formally notify the Director of Energy Safety of any changes (involving a facility, its contact details, or significant safety management) that may impact operations⁸.

A Safety Case:

- update is generally required when facility operations or contact details change
- revision is required before expiry of the five year revision period, subject to the provisions of Section 45 of the Gas Safety Act.

Notification of change

Regulated entities need to notify ESV of any changes to conditions (for example, contact details and facilities) that affect a Safety Case.

Following a number of asset/facility acquisitions, most notably involving organisations within the LPG segment, ESV often did not receive prompt and sufficiently detailed notification of the relevant changes.

Safety Case production

Typical concerns about the production of Safety Cases include the following:

- Inconsistencies in the documentation received are not consistent with the level of review ESV would expect for a document signed off by executive management.
- An understanding of risk and control measures is not apparent.
- Sufficient details about the mains renewal program.
- Not specifying asset and equipment maintenance routines to be followed by staff or contractors.

Some Safety Cases have not kept pace with regulatory obligations and good industry practice, which have progressed over the last five years. Further, some regulated entities have not acknowledged any advances in this area.

Safety Case revision submissions

As at January 2016, the natural gas distribution company Safety Case submissions now exceed their five year revision dates. While submissions to date are only preliminary and a matter for ongoing discussion, the existing accepted Safety Cases will remain in force until ESV formally accepts the revision.

Australian Standards compliance documentation

Some regulated entities have found Australian Standards compliance documentation requirements challenging. In contrast, several reticulated LPG industry group members now have a high quality set of safety framework documents in place.

LPG acceptance audits

ESV has completed the majority of its planned LPG acceptance audits and is pleased with this industry segment's overall response to meeting the necessary legislative requirements and the Australian Standards (as articulated by ESV's guidelines).

⁸ An updated facility description and associated documentation (preferably both clean and change-tracked copies) should be provided.

4. Education and partnerships

4.1. Industry consultation meetings

In September 2015, ESV hosted a consultation meeting with general managers from the gas-transmission pipeline industry group. Representatives from the three natural gas distribution companies were amongst the attendees. (The GPI Safety Management Report for 2015/16 will provide the relevant details from these meetings.)

ESV also hosted an LPG consultative meeting in April 2015.

Individual consultation

ESV frequently consults individually with regulated entities from all industry segments, using these meetings to highlight concerns about their general safety and environmental management framework and compliance with legislation and the relevant Australian Standards.

The GPI Safety Management Report

In March 2015, ESV submitted its first GPI Safety Management Report, which followed two rounds of consultation with organisations representing the regulated entities. ESV received a wide range of feedback both constructive and supportive and raising concerns.

While gas transmission licensees recognised the benefits of transparent reporting, further development is required to ensure the same disposition is shared across all industry segments.

ESV will work with industry towards publishing future editions of the GPI Safety Management Report that will include the names of organisations.

4.2. Ongoing initiatives

ESV's ongoing initiatives involve functional reporting, which will focus on certain operational matters that include the following:

- National gas competency training.
- Key performance indicators.
- Emergency exercises.
- Compliance reporting.
- Capability of capturing all third-party works proposals in the vicinity of assets, and the engineering capacity for assessment prior to commencement of works.

4.3. New initiatives

Documentation and transparency of ESV processes

ESV has engaged Advisian Consulting to document ESV's Safety Case assessment processes and further clarify ESV's guidelines for submission preparation, and expects to distribute the results to regulated entities in early 2016. This will provide regulated entities with greater clarity in terms of ESV's expectations.

National Response Centre

In cooperation with the gas industry, ESV has now terminated the public gas emergency contact service (132 771). The natural gas distribution businesses continue to be the primary responder to public enquiries about gas leaks.

5. Compliance and enforcement

ESV's Compliance and Enforcement Policy and its Compliance Strategy are designed to ensure that community safety and environmental outcomes are achieved as part of ESV's objectives and functions as specified by the Energy Safe Victoria Act 2005, the Electricity Safety Act 1998 (ESA), the Gas Safety Act 1997 (GSA), and the Pipelines Act 2005 (PA).

To date, the vast majority of ESV's activities have been in cooperation with regulated entities, which in most instances responded promptly and effectively. However, where responses continue to be poor, ESV anticipates the use of firmer compliance actions in future.

5.1. Incident investigation outcomes

Statistically, the greatest cause of all pipeline failures is external mechanical interference, and ESV is conducting more investigations of this type of incident. Through these investigations and their outcomes (which can lead to court prosecutions, infringement notices, or official warnings), contractors are being made increasingly aware that pipeline strikes, unauthorised encroachments, and/or near-misses have consequences for them as well as for public safety.

During 2014/15, ESV completed 20 investigations resulting in three infringements being issued for incidents causing damage to gas mains.

The incidents were caused by a combination of more than one of the following:

- Incorrect/non-existent Dial Before You Dig documentation.
- Incorrectly assuming a Dial Before You Dig response is an approval from the asset owner to perform work in the vicinity of assets.
- A failure to manually prove⁹ the exact location of underground assets.
- Not opening the ground or boring beneath the ground as per the Conditions of Works specified by the asset owner prior to the commencement of work.

⁹ Excavating around a pipeline without the use of machinery.

6. Focus and priorities for 2015/16

ESV's focus for 2015/16, apart from continuing its verification audit work, will be city gate and field regulator facilities, as well as the proactivity of regulated entities when it comes to training and competency involving not only in-house field staff and contractors, but also staff tasked with assessing and appointing skilled and competent contractors.

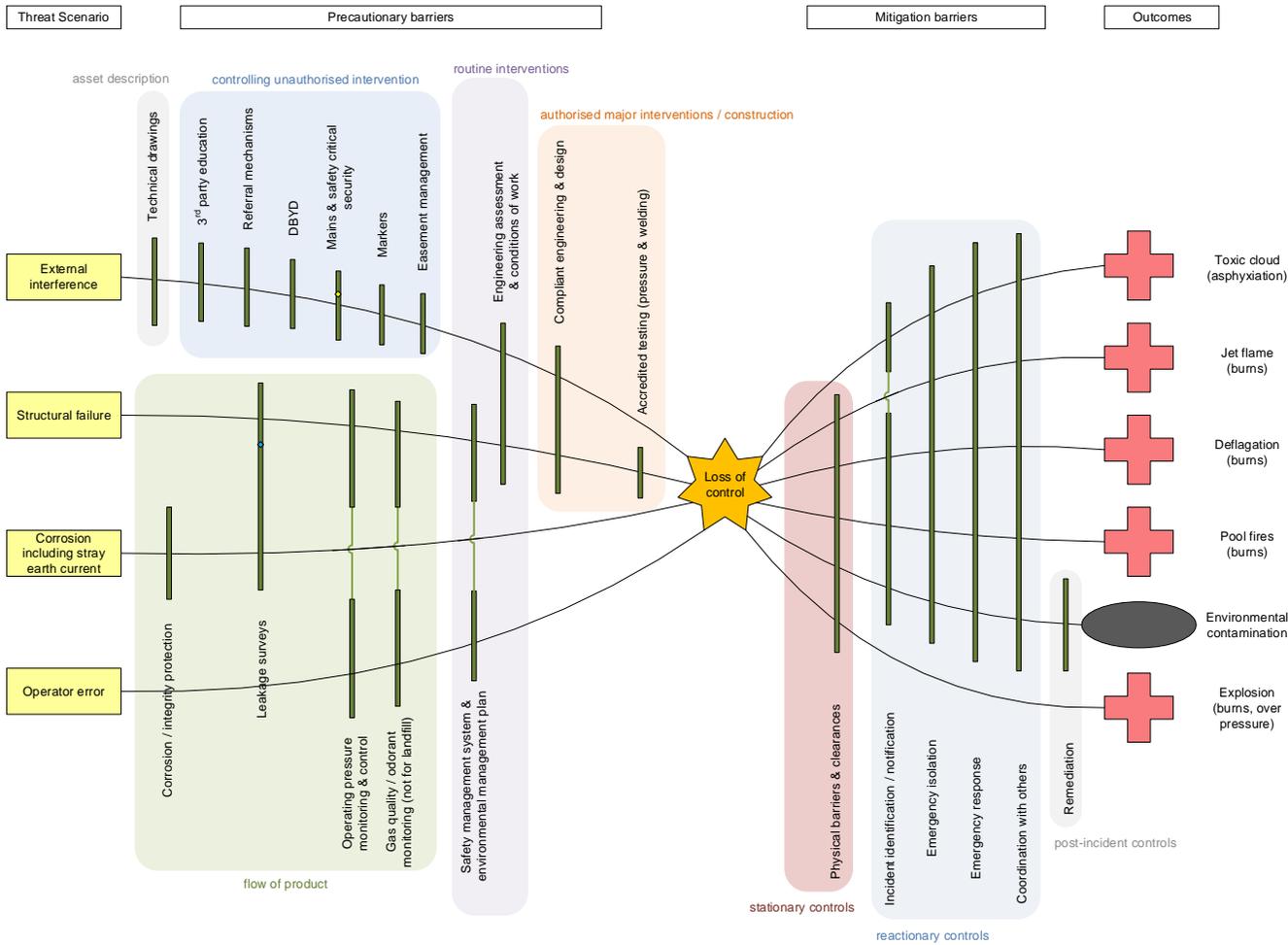
7. Appendix A

7.1. Threat barrier diagrams

These threat barrier diagrams are illustrative of the range of different issues that need to be managed across the various industry segments. They should not be taken as definitive, or in any way limiting the issues that each organization should consider.

Figure 7-1 - Natural gas distribution, reticulated LPG, and landfill biogas

Threat-barrier diagram for product release – natural gas distribution & reticulated LPG & landfill



◆ Focus is on safety critical assets (eg city gates & main line valves) & areas of higher consequence

Figure 7-2 - LPG retailers

Threat-barrier diagram for product release – LPG retailers

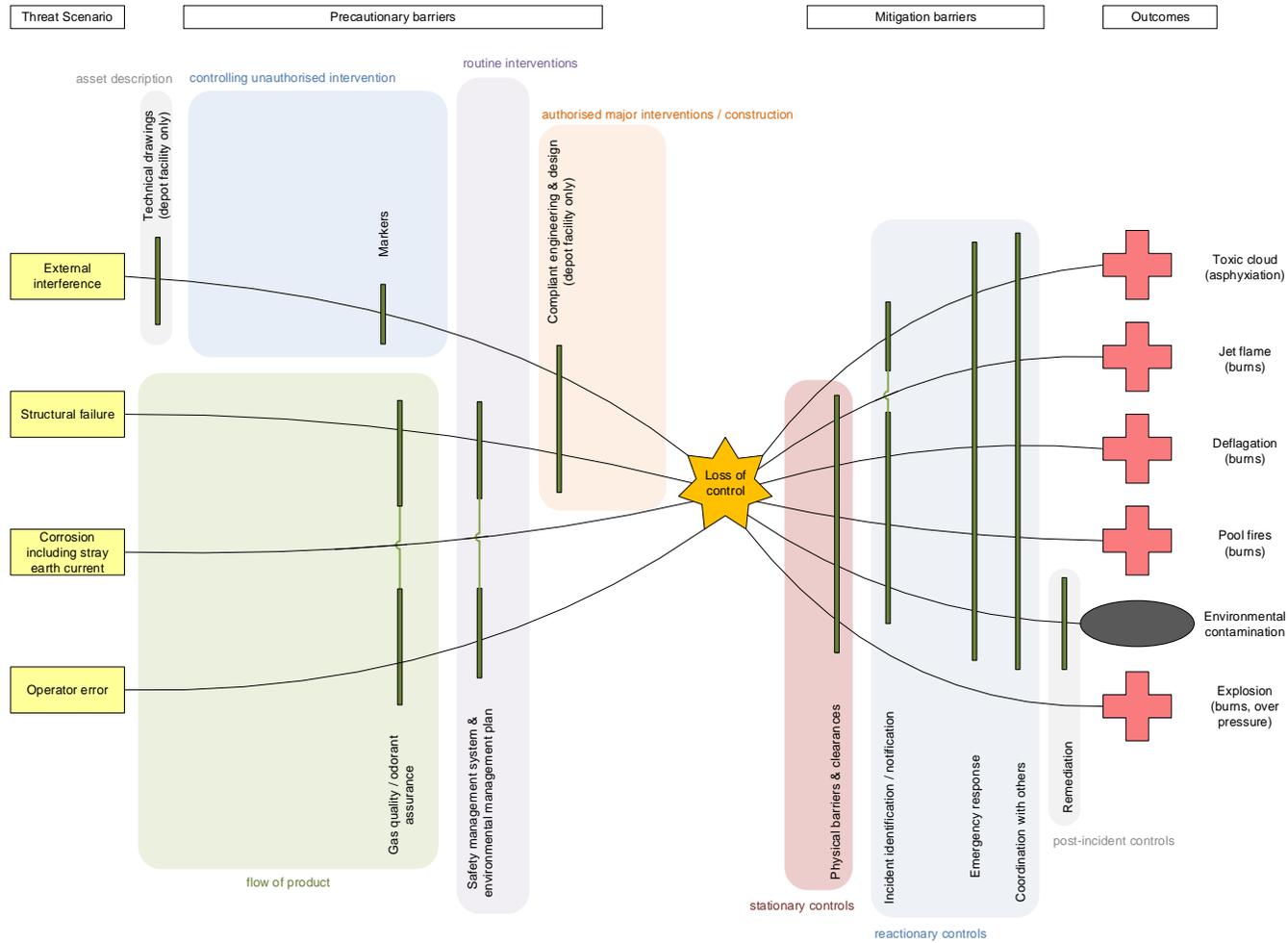
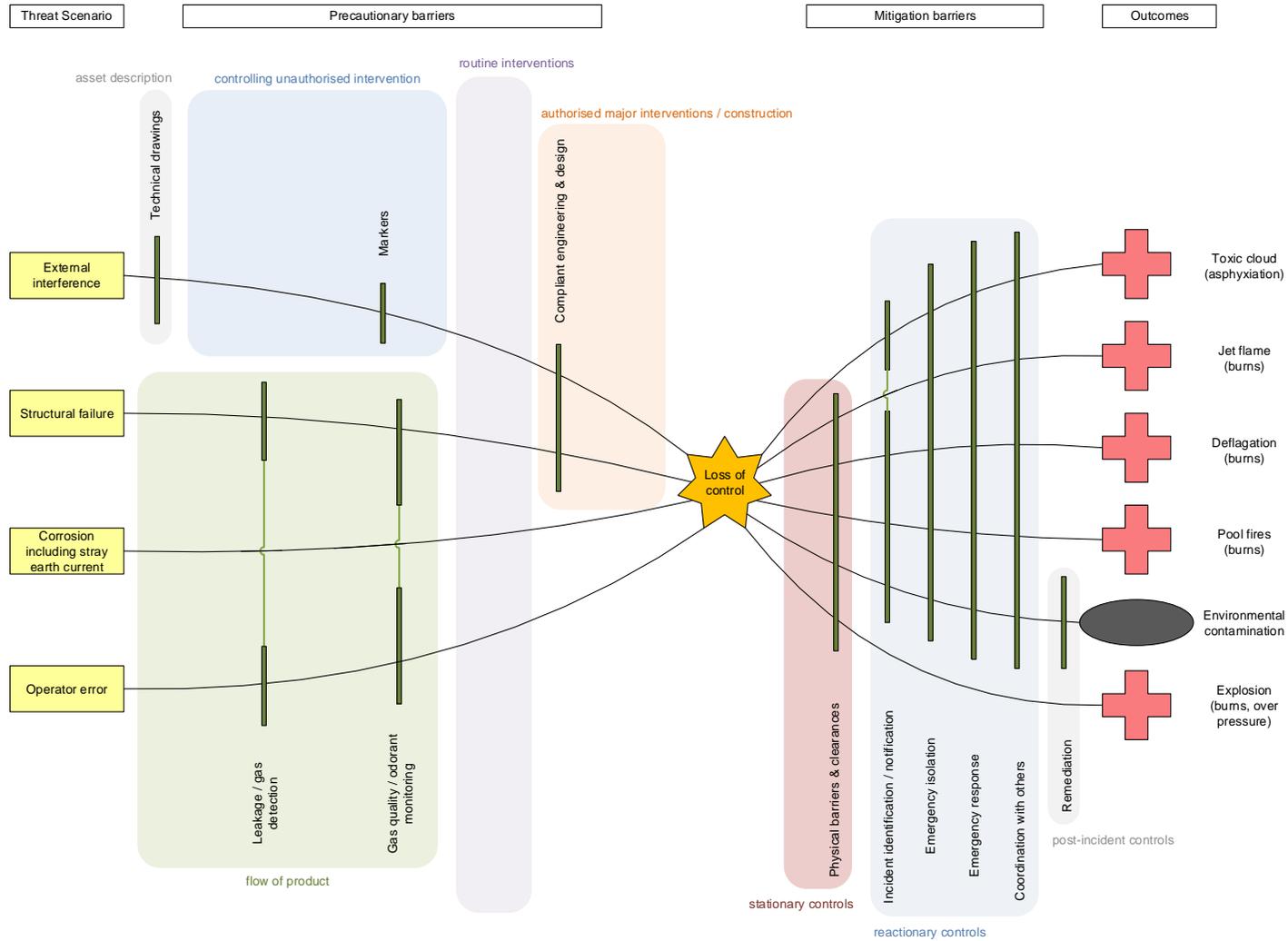


Figure 7-3 - Liquefied natural gas (LNG)

Threat-barrier diagram for product release – LNG



7.2. Terms and abbreviations

Terms and Abbreviations	Meaning
3m works	Works undertaken within three metres of a pipeline
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ALARP	As low as reasonably practicable. A term often used in the context of safety-critical and safety-involved systems. The ALARP principle is that the residual risk shall be as low as reasonably practicable
APGA	Australian Pipelines and Gas Association
AS	Australian Standard/s
Cathodic protection	A technique used to control the corrosion of a metal surface by making it the cathode of an electrochemical cell
Cathodic protection system	An electrical means of mitigating corrosion on buried and submerged metallic structures
Conditions of Works	A specific requirement issued by a pipeline licensee to an external party prior to its proposed works in the vicinity of a pipeline to ensure the safe and reasonable protection of the licensee's asset. Conditions of Works detail the conditions under which work may be undertaken and are provided by licensees to third parties in response to a Dial Before You Dig enquiry
CP	Cathodic protection
DCVG	Direct Current Voltage Gradient
DEDJTR	Department of Economic Development, Jobs, Transport and Resources
DELWP	Department of Environment, Land, Water and Planning
GEMCF	Gas Emergency Management Consultative Forum (transmission consultative committee)
GSA	Gas Safety Act
LNG	Liquefied natural gas

Terms and Abbreviations	Meaning
Location classes (T1 and T2)	Urban location classes, T1 involves suburban areas and T2 involves multi-storey areas or large commercial centres
LPG	Liquefied petroleum gas
MAOP	Maximum allowable operating pressure
MPA	Metropolitan Planning Authority
MAV	Municipal Association of Victoria
NDT	Non-destructive testing
PA	Pipelines Act
Point of loss of control	The point at which a regulated entity no longer has any means to prevent an incident occurring, although it may still be in a position to mitigate the consequences
SMS	Safety management study
Threat barriers	Physical and procedural barriers to injury or damage to people, property, and the environment. This includes barriers between a possible threat and the point of loss of control (precautionary barriers), and barriers between the point of loss of control and potential outcomes (mitigation barriers)