

Elgas Newcastle Depot Hazard audit report



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ATTACHMENTS

- Attachment#1: General layout D-NSW-NEW-GEN-001_0
- Attachment #2: Fire services layout D-NSW-NEW-FIR-001_0
- Attachment #3: Hazardous area D-NSW-NEW-HAZ-001_0

1 Executive Summary

The Audit of the Newcastle LPG storage & Distribution facility was conducted between the dates of 6th to 7th September 2022 at the Newcastle Facility.

The Audit was conducted by Chris King BOC Process Safety and Audit manager as previously agreed with NSW Planning Industry and Environment Department. Chris is independent of site operations.

The Audits were conducted in accordance with BOC internal Audit standards (LIMS-17) & aligned with Hazardous industries planning paper No5 - Hazard Audit guidelines

The audit scope covered both Operations, Engineering and Safety Management systems. The scope is discussed in more detail in the body of this report

Although the body of this report contains full details of questions and audit finding, a summary of findings is listed in Table 1: **Key Audits Findings and Opportunities for improvement** below

Table 1: Key Audits Findings and Opportunities for improvement

1	<ol style="list-style-type: none"> Document the function description and test methodology for the SCCM Develop PASS/FAIL criteria for controls Conduct function testing to function description ensure the SCCM functions correctly Ensure captured/flagged as safety critical in maintenance system and regular testing frequency in place i.e. <ul style="list-style-type: none"> Bulk high/Low level alarm Vapour compressor high level Vapour compressor High discharge pressure Vapour pressure safety valve setpoint
2	Review your HAZOP recommendations and ensure all elements completed up to functional descriptions for SIS, maintenance scheduled and PID updates <ul style="list-style-type: none"> In review Actions: 2/3/4/6 not completed on PID Vapour compressor Pressure transmitter not shown (see HAZOP action #2!) Vapour compressor PSV set point TBA Vapor compressor has LT tag on liquid capture but not LSHH (see HAZOP action Oil pressure gauge range incorrect Level transmitter on bulk tank states low level? No setpoint?
3	Review suitability of the ELGGEN SMS for ELGAS non-depot MHF operations. Is this level of SMS more suited to MHF operations and over and above depot requirements, can it be simplified? – its obvious site has not had time to review and implement the full SMS requirements & are therefore unable demonstrate compliance e.g., compliance issues at site (sample) <ul style="list-style-type: none"> SMS Internal audits section at rear of SMS elements not being completed Contractor selection format from not being followed HSE Performance card monitoring not being completed but in SMS If site is expected to be compliant, I'd recommend a full SMS compliance audit (at Newcastle and others non MHF) be completed later & take into consideration site capacity to comply.
4	SMS Performance standards for depots – what performance standards are site expected to report on

5	JPC in place – however no documented pass/fail criteria or actions/process to take on poor performance – recommend these are documented
6	<p>Emergency plan Section 8.2 emergency plan testing states Requirement 6 monthly drills covering all scenarios over two years – currently 12 monthly Documented debriefs required and report in score card – this is not taking place – see central actions</p> <p>This plan is copied from an MHF template & needs review to align with what depot can do and can support</p>
7	<p>Unable to sight evidence that ALL emergency stops are tested</p> <ul style="list-style-type: none"> - Develop rotational testing process to ensure all 'full site' EMS are covered/cycled through in testing program - Also ensure that the 'fill system only shutdowns' EMS are function tested in rotation
8	Vapour compressor discharge PSV Tag with number/setpoint and test date:
9	<p>Unable to sight action management process or auditable trail of rectification actions for "shower low flow fault" from Contractor's report</p> <p>Recommended that any action from any service or inspection report is formally captured in action management database to ensure action is tracked and closed & provide auditable evidence trial of issue and rectification</p>
10	<p>Shed need to be added to housekeeping inspection as becoming a bit of a dumping ground</p> <ul style="list-style-type: none"> - Flammable warning signage missing from flame proof cabinet - Full N2 cylinders in shed, leak could create asphyxiate atmosphere– relocate - Pile of Fire extinguishers in corner – no status - Rubbish etc building up including old paint spray cans etc - Some chemical drums un banded
11	<p>Site specific training procedures In review of training material, cylinder fillers and drivers are trained in generic procedures but unable to site evidence of training need analysis/profile that includes site specific procedures</p> <p>i.e. 14 site specific Newcastle procedures that I'm unable to sight in TNA's</p>
12	<p>Review management of actions/traceability of actions from weekly depot checks</p> <ul style="list-style-type: none"> - Noted a number of N/A responses where there should have been a response – this was done some months ago and had not been corrected - Internal audit reports – how do you determine the actions have been addressed comments to indication why the action was not adopted (see report 12/2/2020 question 142 – P3 – Remote shut off at least 5m away? Shut off < 2.7m – apparently this standard has changed but could find no evidence of comments actions indicating this - <p>Note the actions don't necessarily need to be in Intellex but there should be some process & documentation to be able to demonstrate that the action has been addressed</p>
13	<p>OFI: Hazard and risk register</p> <ul style="list-style-type: none"> - does not have an attendance list – therefore unable to demonstrate consultation – recommend consultation element added to RA - For medium risks what additional control were considered / rejected to demonstrate SFARP? - Suggest review of RA
14	OFI: recommend signage place above spill kit location, to ensure stays at location.
15	OFI: All the cylinder area to right side of yard is hazardous area, however, appears to be process of hanging signs on cylinders i.e. empty / full – compliance to ensure all cylinders groups are clearly marked could be better – i.e. noted full cages in an area with 'empty' marked cylinders in.
16	OFI: Wooden pallets in cylinder storage area – fuel source – should be removed

17	OFl: Level gauges wiring to level transmitter. There is a connector between the two wire sizes just below the LTX that is wrapped in insulation tape? – hope the connector is waterproof! – consider an installation with an appropriate waterproof junction box to connect cables
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Actions Management

ELGAS use an electronic audit action management database system called INTELEX. The Audit reports, summary & recommendations will be managed as per ELGAS Safety Management System Element 15B – Corrective Actions

Chris King – Process Safety and Audit Manager – Health and Safety Department BOC
Date: 11/10/2022

2 Introduction

2.1 Background

Elgas Ltd operates a Liquefied Petroleum Gas (LPG) storage and cylinder filling loading facility at Part of 130 Cormorant Road (Corner of Egret Street), Kooragang, NSW.

A condition of development consent for the facility was to undertake a Hazard Audits in accordance with NSW Department of Planning and Infrastructure "Hazardous Industry Planning Advisory Guidelines" (HIPAP) No.5 (Ref.1) by an approved independent auditor and submit a report to the Department of Planning NSW.

Elgas obtained approval from NSW Department of Planning for Chris King, BOC Process Safety and Audit manager from BOC Health and safety department to undertake the 2022 Hazard Audit. This audit was carried out in September 2022.

2.2 Audit Scope

The audit scope and questions (see **Table 4: Complete Audit Questions, Findings and Recommendations**) covered the following areas

- Company organisation, safety policy and safety responsibility structure.
- Plant, Equipment & Maintenance (*ref_HIPAP#5_ 3.4.1 Plant and Equipment*)
- Loading and Unloading Operations (*ref_HIPAP#5_ 3.4.2 Loading and Unloading Operations*)
- HAZCHEM Storage (*ref_HIPAP#5_ 3.4.3 Storage*)
- Process control, including Process Control Computer Controls in Process Plants (*ref_HIPAP#5_ 3.4.4 Process Control & 3.4.4.1 Process Control Computer Controls in Process Plants*)
- Fire Safety (*ref_HIPAP#5_ 3.4.5 Fire Safety*)
- Environmental Protection Systems (*ref_HIPAP#5_ 3.4.6 Environmental Protection Systems*)
- Facility Security (*ref_HIPAP#5_ 3.4.7 Facility Security*)
- Safety Management System (SMS), specifically covering the procedures for operation, maintenance, training, change management, incident investigation and emergency response.
- Risk management
- Management of change
- Safe system of work
- Contractor Management
- Audits and action management

- Plant Procedures, Records and Other Documentation (*ref_HIPAP#5_2.4.1 Plant Procedures, Records and Other Documentation*)
- Operator Training (*ref_HIPAP#5_2.4.2 Operator Training*)
- Emergency Planning (*ref_HIPAP#5_2.4.3 Emergency planning*)
- Incident report & History (*ref_HIPAP#5_2.5.1 Incident History*)
- Risk Studies (*ref_HIPAP#5_2.5.2 Previous Studies*)

2.3 Audit Objective

The objective of this hazard audit was to evaluate the type and magnitude of hazards and the control & governance systems in place to prevent these Hazards from eventuating. The outcome of this audit is a prioritized list of recommendations for those controls and governance process

2.4 Audit methodology

Three types of audit methodology were used to assess the level of compliance & identification of any process gaps.

- Conducting interviewing with relevant personnel e.g., Site manager, plant operators & contractors
- Review of documentation and records e.g., Training records, procedures, etc
- Observation during filling operation & transport operations.

The audit was conducted in alignment with LIMS 17 – Auditing. Audit findings were rated using the Hazard rating priority system as described in Safety management system as follows:

- P1 - Severe Risk or Major System Non-Conformance
- P2 - High Risk or Major System Non-Conformance
- P3 - Medium Risk / Minor System Non-Conformance
- P4 - Low Risk, Observation/Opportunity for improvement

The following personnel attended the audit at Elgas Newcastle Facility

Table 2: List of auditees

ATTENDEES	POSITION	COMPANY
Pat Egan	NNSW Regional Depot Operations Manager	Elgas
David Russell	Newcastle/Hunter Valley Customer Service Manager	Elgas
Adam Brady	NNSW Regional Transport Operation Manager	Elgas

2.5 Independent Auditor

The site audit was conducted by Chris King BOC Ltd Process Safety and audit manager who is part of the Safety, Health, Quality and Environment department. This department is independent within BOC structure.

Chris is a certified lead auditor with over 22 years' experience with BOC and over 43 years chemical and gas industry experience. He has led the BOC South Pacific Hazard audit program for over 12 years and has conducted previous Hazard audits under HIPAP #5 for a number of BOC and Elgas facilities in South Pacific

3 Site description

3.1.1 Location

The Elgas LPG depot is located on part of 130, Cormorant Road, Kooragang, NSW (Part Lot 1, DP 1195449). The site covers approximately 7500 m² (55 metres x 138 metres).

There is an existing service station (gasoline and diesel) retail outlet and a car wash facility on Part of 130 Cormorant Road. The site is on the northern part of 130, Cormorant Road, with vehicle access and exit to be located on Egret Street.

3.1.2 Overview of Operations

The following operations are performed at the LPG Depot:

- LPG (propane) is delivered by single or B-double road tankers from the Elgas Cavern facility in Kooragang to Kooragang Depot. The average temperature of propane is 18°C (generally slightly below ambient).
- The product is unloaded from the tanker into the bulk Tank either via a decant or vapour compressor
- LPG from the storage tank is loaded into 6 or 9 tonne road tankers (Bobtails) for distribution to customers
- 8.5, 15, 18 and 45 Kg LPG cylinders are filled at the Cylinder filling Dock, stored in the storage area and then distributed to customer via cylinder trucks.
- Administration offices are also located on site

3.1.3 Properties for LPG

- LPG(propane) is a flammable gas, leaks if ignited can cause burns and damage by flash or jet fire, confined and unconfined vapour cloud explosions. The storage vessel can for a Burning Liquid Vapour cloud explosion or BLEVE if heated via an external fire.
- The vapour is heavier than air and will tend to follow the ground, accumulating in low points before being dispersed.
- Personal contact directly with the vaporising liquid can cause freezing of body tissue resulting in "cold burns".
- LPG vapour cloud can be harmful through the displacement of oxygen, resulting in an asphyxiation hazard.

When propane liquid under pressure is release to atmosphere due to loss of containment, the following effects occur:

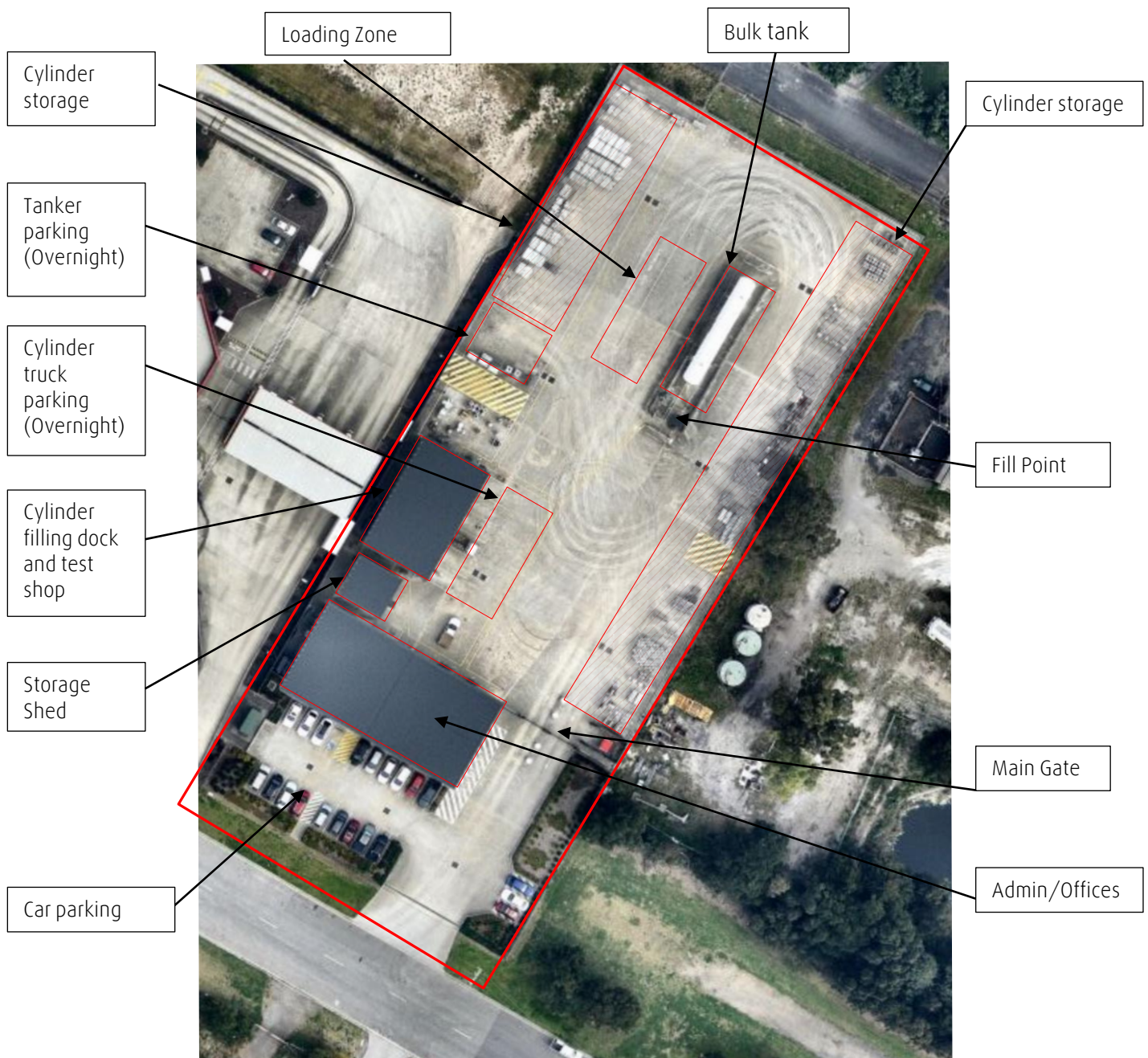
- Since the gas is kept as a liquid under pressure at ambient temperature, once the pressure is released, the propane tends to reach its equilibrium temperature of -42OC at atmospheric pressure.
- The heat to vaporise the propane comes from the liquid itself as it gives out heat while cooling down from the storage temperature (about 25OC) to -42OC. The vaporised portion 'flashes' off and

disperses downwind. This fraction is known as 'adiabatic flash' as it is a self-contained process with no external heat provided.

3.1.4 Site layout

Layout diagram of the facility is shown in Figure 1.

Figure 1 : Site Layout



3.1.4.1 Bulk Storage

The main LPG storage vessel is approximately 20m long with 2.6m outside diameter, with a water capacity of 100 kL and an LPG capacity of 51 tonnes. It will contain odourised LPG

The protection systems provided on the storage vessel comprise the following:

- Fendolite M11 (cementitious fireproofing material) coating on storage vessel for passive fire protection
- Pressure relief valves located on top of the vessel
- Excess flow valves and back check valves for primary shutoff
- Manual ball valves for secondary shutoff
- Air operated fire safe isolation valves for tertiary shutoff, with remote emergency isolation provision.
- High level protection shutdown (set at 88% tank level)

3.1.4.2 Tanker Loading and unloading

LPG (propane) is received from the Elgas Cavern in Kooragang via road tankers to the Kooragang Depot. The road tankers are routed to the LPG load-out facility, and unloaded by the driver, using the site compressor, compressing LPG in the tanker and pushing the liquid into the storage tank. The storage tanks level is first noted prior to unloading to ensure that there is adequate ullage in the tank to receive the full road tanker load. The driver then connects the Liquid and vapour hoses to the tank and transfers the Tanker load into the bulk vessel

Bobtails reverse the process, connecting liquid and vapour hoses and pushing the Bulk vessel liquid into the Bobtail tanker

The main features of the tanker loading bay are:

- The tanker must be earthed to ensure that there is no static build up. The prime-mover battery on the road tanker will be isolated, thus the tanker may not be moved. The site air-lines are connected to the truck to provide pneumatics to enable the tanker internal self-closing (ISC) control valve to be opened.
- Liquid fill and vapour return piping manifold with manual isolation and air operated isolation valves.
- Loading pump stop/ start station from loading bay.
- Mechanical brake interlock system on all road tankers that prevent the movement of the road tanker should any transfer hoses still be connected.
- The LPG loading and unloading piping at the load-out facility is fitted with breakaway couplings. Thus, in the event the tanker moves from its load-out position with the loading pipes/hoses still connected, no product release would occur.

- Emergency shutdown buttons (site-wide ESD). On operation, it closes all the pneumatically operated valves by venting the instrument air

3.1.4.3 Cylinder Filling Dock

The cylinder filling process takes place in the on the cylinder filling dock. This is a manual process. A dedicated LPG line runs from the storage tank to the cylinder filling station feeding the cylinders on two parallel weigh scales via an LPG pump
The weigh scales are calibrated to fill 8.5, 15, 18 and 45 kg cylinders. The electronic weigh scale would automatically shut off the fill line valve once the set weight is reached.

3.1.4.4 LPG Cylinder storage

The cylinder storage maximum inventory can be up to 94 tonnes.

The cylinders come in the following sizes:

- 45 kg cylinders – Stored pallets of 9 cylinders per cage (1 high)
- 15-18 kg cylinders – Stored pallets of 16 cylinders per cage (2 high)
- 8.5kg cylinders – Stored pallets of 40 cylinders per cage. Stored in double decker cages (stacked 2 high)
- 90, 190 and 210 kg cylinders – stored individually on the ground.

3.1.4.5 Fire protection systems

The site is equipped with the following fire protection equipment.

- A system of firewater hydrants and firewater spray monitors located on the firewater ring main.
- Fire extinguishers located around the operations area and the office building.
- Fire protection system will be designed to the requirements of AS-1596, AS-2419 and API 2510A.

3.1.4.6 Site security

The site will be enclosed by a mesh wire fence on Egret Street and colour bond walls on the south, north and west, approximately 2m high. The entry and exit gates for the depot are on Egret Street.

The gates are normally kept closed at all times and access is through the site control process.

A personnel access gate is located at the office building and can only be opened by Elgas personnel issued with identity password cards. Visitors to the site must report to the reception and will be met by Elgas personnel who will guide them into the work area via this access point (if such access is required).

3.1.4.7 Overnight parking of tankers/trucks

Bobtail tankers and Cylinder delivery trucks will park in designated areas overnight. These are normally parked with full inventories ready for the next day of deliveries.

4 Newcastle safety Incidents and Safework NSW improvement notices

4.1.1 Relevant incidents

The site had no significant safety incidents or Safework improvement notices

5 Safety management system Summary

5.1 Safety management system overview

The SMS comprises a hierarchy of documents that provide the necessary detail to implement the company HSE policies. It contains 20 elements that address all the major safety, health and environment concerns from operations on site.

The SMS elements are listed in **Error! Reference source not found. 3**, further descriptions of each element can be found in the following section. Elements 1, 2A and 2B are foundational documents which provide the boundaries and direction for the management of safety. Elements 3 through 14 are active procedures for particular processes. Elements 15A-15D are for review and improvement

Table 3: List of Safety management system elements

Element	Description
1	HSE Management Commitment
2A	Risk & Hazard Management
2B	Major Incident Review
3A	Management of Change
3B	Control of Overrides
4	Engineering projects
5	Personnel Safety & Health
6A	Safe Systems of Work (PTW)
6B	Safe Systems of Work (Site Rules)
7	Plant Operation
8	Plant Maintenance
9	Contractor Management
10	Training Management
11	Documentation Management
12	Environmental Management
13	Emergency Management
14	Security Management

Element	Description
15A	Incident Management
15B	Corrective Actions
15C	Audits
15D	HSE Performance Monitoring

5.1.1 Element 1 - S&HE Management Commitment

HSE Management Commitment element provides an overview of the SMS implemented across Newcastle facility as the primary means of ensuring safe operation, and helps demonstrate how the system:

- Ensures control of all safety critical business processes,
- Achieves compliance with legislative and elected management system requirements, and
- Addresses Workplace Health, Safety, and Environment management.

Key documents linked to this SMS element include the Health Safety and Environment (HSE) policy and the Drug and Alcohol Policy

5.1.2 Element 2A – Risk and Hazard Management

The Risk & Hazard Management element describes the requirements and responsibilities for risk and hazard management at Newcastle, one of the essential elements in the provision of safe workplaces. It covers all site activities, products and services including the purchase of any goods or services for use on site.

The aim of risk assessment processes is to eliminate risk. Where elimination is not reasonably practicable, risks are minimised as low as is reasonably practicable.

5.1.3 Element 2B – Major Incident Review

The Major Incident Review element describes the requirements and responsibilities for the review of Major Incidents (MIs) for Newcastle.

This element describes the processes to identify potential MIs, their causes and potential outcomes, existing control measures to prevent/mitigate the consequences of the MI, and evaluation of control measures for adequacy, with the view to demonstrating SFARP.

The process involves consultation with relevant personnel and outcomes are communicated to all personnel, including contractors.

5.1.4 Element 3A - Management of Change

Management of Change (MOC) is an important element in the SMS. This element describes the requirements and responsibilities for the management of changes at Newcastle. The purpose is to ensure

that all changes and modifications are reviewed and well documented for their potential impact on health, safety and the environment prior to implementation.
The scope of this element includes changes to plant, processes, procedures and roles.

5.1.5 Element 3-B Control of Overrides

Sometimes an equipment or instrument may have to be disabled temporarily. Element 3B covers the control of such overrides. The main features are: Overrides for routine maintenance exceeding one day, or for breakdown maintenance must be approved on a permit to work form, after review of potential safety implications. The procedure covers the following equipment/ instruments:

- Safety systems such as PSV, ESD, emergency evacuation alarms, fire protection and Fire & Gas detection systems, and
- Process control systems such as permissive interlocks, and process variable alarms (pressure, temperature, level).

5.1.6 Element 4 – Engineering Projects

Plant Design Element describes the requirements and responsibilities for the design, construction and commissioning of all site projects which may impact on safety, health or the environment either during implementation or during subsequent operation of the facility.

5.1.7 Element 5 - Personnel Health and Safety

The Personnel Safety and Health element describes the requirements and responsibilities for all aspects of occupational safety and health management.

The main parameters include:

- Occupational health and hygiene (asbestos control, smoke-free environment, drug and alcohol policy, hearing conservation, first aid, rehabilitation, ergonomics and manual handling);
- Health assessment and medical records; and
- Workplace hygiene.

5.1.8 Element 6 - Safe Systems of Work

This Safe Systems of Work element describes the processes involved in the assessment and control of hazards in hazardous work tasks, typically those involving construction, demolition, maintenance, inspection, repair or testing work. These processes include Permit to Work and Site rules

5.1.9 Element 7 - Plant Operation

Plant Operation describes the requirements and responsibilities for safe operation of plant and equipment, including routine and non-routine operations, and documentation and records. It makes cross-references to the Operating Standards. Non-routine operations are managed under the Job Safety Analysis / Work Permit procedures

5.1.10 Element 8 - Plant Maintenance

Plant Maintenance describes the requirements and responsibilities for managing the maintenance of plant and equipment at the site, including requirements for the following:

- maintenance of fixed plant and equipment,
- checks of mobile plant and equipment.
- monitoring of system performance.
- consultation with employees; and
- review and revision of plant inspection and maintenance in case of changes to operating equipment, procedures and processes.

The maintenance manual has been updated by the Terminal Manager and Reliability Manager. All equipment are given asset numbers based on the tag numbers on the P&IDs and entered into a maintenance management software 'MEX', along with inspection/ preventive maintenance frequencies.

5.1.10.1 Element 8a – Fire Systems Maintenance and Assurance

Fire System maintenance and Assurance provides details of the fires system maintenance checks

5.1.11 Element 9 - Contractor Management

The Contractor Management element describes the requirements and responsibilities for the management of contractors, including checks on their contract and insurances, experience and competency, and their equipment.

5.1.12 Element 10 – Training

The Training Management element covers all site personnel training needs, comprehension and records, and requirements for training development and delivery.

Elgas maintains a database, Traccess, for keeping records of training of employees and contractors.

The Traccess system contains training modules on the various operations and maintenance activities on the site. Each person, depending on his/her role, has to complete the training modules for achieving the required competency level. The modules contain an assessment questionnaire that should be completed by the trainee. On successful completion of training, the competence level is entered into Traccess for record keeping.

5.1.13 Element 11 - Documentation Management

Documentation Management describes the requirements and responsibilities for management of SH&E documentation relating to the design, operation, maintenance and approval status of the Newcastle facility. The document management consists of a Plant Dossier which contains the required documentation

5.1.14 Element 12 - Environmental Management

Environmental Management describes the requirements and responsibilities for management of any impacts on the environment relating to the design, operation and maintenance of the facility. The Terminal Manager is responsible for implementing the requirements of this procedure.

The procedure covers the following:

- Environmental risk assessment
- Waste management, and
- Neighbourhood impact.

5.1.15 Element 13 - Emergency Management

The Emergency Management element describes the requirements and responsibilities for developing and maintaining an effective emergency response system at the site. The site Emergency Response Plan is the documented outcome of this emergency response system.

A written Emergency Response Plan (ERP) is developed and maintained that is appropriate to the level of risk from the site, its activities and its neighbours.

5.1.16 Element 14 - Security Management

The Security Management element describes the requirements for managing site security at the site. The MHF Security Plan is the documented outcome of this procedure.

The Plant Manager is responsible for implementing the procedure.

The procedure covers:

- Bomb threat procedures;
- Suspicious purchases;
- Suspicious behaviour;
- Intruder prevention; and
- Response to security incidents

5.1.17 Element 15A - Incident Management

The Incident Management element details the requirements for immediate action, notification, investigation and reporting of HSE and security-related incidents at the site. The scope of this procedure includes events that:

- Have the potential to cause injury or illness;
- Can cause damage or loss to company assets;
- Cause environmental damage;
- Raise public alarm;
- Are potentially notifiable to the relevant statutory authorities; and/or

- Have other HSE and security outcomes with the potential for learning or requiring corrective action.

The National HSE Team reviews all reported incidents, near misses and potential incidents to determine the appropriate course of action. All incidents and near misses are reported to the Elgas Health Safety and Environment Manager

5.1.18 Element 15 B - Corrective Actions

Corrective actions include opportunities for improvement as well as SH&E improvement actions from incidents and audits. This Element describes the requirements and responsibilities for managing corrective actions at the site. The actions arising out of incident investigations and audits are required to be placed in the action tracker database for follow up and close out.

5.1.19 Element 15C – Audits

This Element describes the requirements and responsibilities for managing SH&E audits at the site. SH&E audits include the following:

- Internal audits performed by Elgas personnel, or contractors, from another site or part of the company. Each Element of the site SMS management system is scheduled for audit, using an Internal SMS Audit Template to quantify the level of compliance and identify any nonconformances.
- Internal management reviews of SMS, performed annually by the Newcastle Manager or nominee, using an Internal Management Review Template. These reviews cover internal audit checklist findings for each SMS Element, and associated Key Performance Indicator (KPI) monitoring results. The Newcastle Manager identifies improvement opportunities from these reviews for inclusion in the annual SH&E Improvement Plan.
- External audits arranged by the Newcastle Manager and performed by external personnel in accordance with legislative and company requirements, including insurance audits, and periodic Hazard Audits as part of compliance with conditions of development consent.
- Audits conducted by Regulatory agencies. NSW WorkCover or the Department of Planning and Infrastructure may conduct such audits on an ad hoc basis, with due notice to the management

5.1.20 Element 15D - SH&E Performance Monitoring

SH&E Performance Monitoring describes the requirements and responsibilities for monitoring of safety management SH&E performance standards at the site. The performance of the SMS is measured by KPIs and reported in the SH&E Performance Scorecard, which is discussed with site personnel at the monthly safety meetings and the results will be summarized for inclusion in the monthly site operations management report

6 Audit Findings

This section contains the findings and recommendations from the Hazard Audit of Newcastle LPG facility Kooragang. The recommendations are summarised in executive Summary of this document. A printed copy of the HSE Policy is signed by the regional business unit director and is available in the Values, Vision and Policies section in LIMS database and displayed in prominent positions at facilities.

6.1 Audit Action Management

Audit Corrective action requests have been loaded into BOC Interlex software for Action management purposes.

Table 4: Complete Audit Questions, Findings and Recommendations

Hazard audit of LPG plant operations (ref HIPAP#5_Section 3.4)

1. Plant, Equipment & Maintenance (ref HIPAP#5_3.4.1 Plant and Equipment)		
A description of process plant and equipment in use and comments on key features of design and operating parameters should be provided, with references to design specifications, drawings and other documents containing more detailed information. The audit team should comment on the condition of buildings, process and ancillary equipment and associated protection systems. Recommendations may cover both specific items of equipment, groups of units or larger process areas.		
Nos	Question	Observation / Recommendation
1.1	<i>Are process and site drawings current and available on the site? e.g., Site plan, fire system, drainage, PID's, electrical drawings etc</i>	Action: Review PID's and update <ul style="list-style-type: none"> - Issues with PID - Vapour compressor Pressure transmitter not shown (see HAZOP action #2!) - Vapour compressor PSV set point TBA - Vapor compressor has LT tag on liquid capture but not LSHH (see HAZOP action - Oil pressure gauge range incorrect - Level transmitter on bulk tank states low level? No setpoint? (see HAZOP action #3) General Site plan / Fire systems drawing reviewed – all OK
1.2	<i>Is critical equipment flagged in CMMS and testing being conducted as required. Note critical equipment test procedures should have pass / fail criteria to determine effectiveness?</i>	General maintenance – key critical safety systems at Newcastle are not flagged in the EMAP i.e vapour compressor PSV, Vapour compressor high liquid level and discharge pressure Action: Flag critical safety equipment in EMAP <ul style="list-style-type: none"> - Bulk hi level alarm - Vapour compressor high level - High discharge pressure - Vapour pressure safety valve
1.3	<i>IS critical overdue maintenance monitored and if going overdue a suitable documented risk assessment conducted to assess safety impact?</i>	No as critical equipment is not flagged you cannot determine if it is overdue – see above

1.4	<i>Is there an emergency shutdown system in place, has it been tested, are there records?</i>	<p>Yes there are 5 (five) push buttons that are tested during weekly testing – full function test and trip</p> <p>Cannot demonstrate that all EMS are tested in rotation Action: Develop rotation testing process to ensure all ‘full site’ EMS are covered in testing program Also ensure that the ‘fill system only shutdowns’ EMS are function tested in rotation</p>
1.5	<i>Is there a pressure vessel register and are the pressure vessel inspection certificates up to date?</i>	Satisfactory – Sighted vessel registration certificate / PSV certs (Asset number 450655) – internal inspection not due to 2030
1.6	<i>Is there a PSV register Are the PSV inspection certificates up to date?</i>	See vapour compressor
1.7	<i>Pressure relief valves tagged with number, set-point & within test – discharge to safe location?</i>	<p>Vapour compressor not tagged with test date, tag etc</p> <p>Action: Tag with number/setpoint and test date: Vapour compressor discharge PSV</p>
1.8	<i>Is rotating equipment part of the maintenance regime and are the tests up to date?</i>	Yes sighted vapour compressor in EMAP CMMS – asset number 450660 & Esbray pump 450665
	<p><i>Transfer pumps:</i></p> <ul style="list-style-type: none"> • Are emergency stops provided in filling & tank area? - OK • Is a pump starter "lock-out" facility provided?-OK • Are the pump motor and electrics flameproof/explosion proof - OK • Does differential by-pass for the pump return to tank?-OK • condition of pump ground mounting/hold down adequate?-OK • Guarding?-OK 	Yes all OK
1.9	<p><i>Vapor compressors</i></p> <ul style="list-style-type: none"> • Is there a high-level trip fitted on suction line trap? • Condition satisfactory? 	Yes fitted but no evidence of function testing see action elsewhere
1.10	<i>Is pipework maintained as per AS3788?</i>	OK checked
1.11	<i>Are all valves and labeling satisfactory?</i>	OK – SS tags fitted – sample checked against PID
1.12	<i>Are all hoses (tanker & cylinder) covered in the maintenance regime and is testing / certification up to date?</i>	<p>Transfer hoses and cylinder fill hoses are replaced at 5 yearly intervals – this is managed via CMMS & national maintenance</p> <p>Tagging in field indicates that the hose are in tested</p> <p>Depot inspection review hoses – sighted Inservice hose inspection certificates for all hoses</p>
1.13	<i>How is corrosion of buried vessels and pipework prevented? e.g., cathodic protection- are these systems maintained?</i>	Visually inspected Satisfactory
1.14	<i>How are other safety equipment identified and inspected?</i>	<p>Checked spill kits – OK</p> <p>OFI – recommend signage place above spill kit location, to ensure stays at location.</p> <p>Safety showers are tested – sighted inspection report - noted that last inspection identified low flow – action managed and not report on subsequent test</p>

		Action: recommended that any action from any service or inspection report is formally captured in action management database to ensure action is tracked and closed & provide auditable evidence trail of issue and rectification
1.15	Is there a gas detection system, is maintained & tested?	N/A – local portable gas detectors
1.16	Building adequate? <ul style="list-style-type: none"> Are there sufficient means of escape from filling area and are they free from obstruction? Housekeeping? Structure sound? 	Satisfactory Action: Shed need to be added to housekeeping inspection as becoming a bit of a dumping ground <ul style="list-style-type: none"> Flammable warning signage missing from flame proof cabinet Full N2 cylinders in shed, leak could create asphyxiate atmosphere– relocate Pile of Fire extinguishers in corner – no status Rubbish etc building up including old paint spray cans etc Some chemical drums un banded
1.17	Are Check condition of earth/ ground point for tanker to ensure electrical continuity maintained?	Sighted earthing checks spreadsheet – and work order JOB- 18955 OFI: Note some earthing leads not connected but still tagged? spares clearly indicate status – Red earthing cable near vapour compressor no tags Earthing testing is OK – these are spares
1.18	Any other observations?	N/A

2. Loading and Unloading Operations (ref_HIPAP#5_3.4.2 Loading and Unloading Operations)		
A description of modes of transport of goods to and from the facility should be provided along with the average and maximum quantities transported, comments on whether loading and unloading operations were observed, the adequacy of equipment, operator procedures and safety systems and recommendations for further improvement.		
Nos	Question	Observation / Recommendation
2.1	Are unloading/loading SOP in place, are driver training and assessed as competent? Are drivers following the procedures (observe a fill in possible?)	Yes – sighted [REDACTED] and [REDACTED] training records
2.2	Vehicle impact protection satisfactory for pipework and tanks	<u>OK</u>
2.3	Are there controls to prevent tow away?	OK
2.4	Are the fill points fitted with break- away couplings etc and designed to AS1596?	OK
2.5	Are kerbs, walkways and barriers in place to prevent damage to the fill point and prevent pedestrian access to fill area	<u>OK</u>
2.6	Are tanker controls, including remote stop buttons, accessible. Hose connection visible from fillers position.	<u>OK</u>
2.7	Is 'TIMS' unit functioning and tested	<u>OK weekly tests</u>
2.8	Are transfer hose regularly inspected and in test.	<u>OK</u>
2.9	Are tanker controls in test i.e., Bobtail High level trip, Tow away etc.	OK

2.10	Inspect loading and unloading area and loading/unloading equipment for suitability and satisfactory condition?	OK
2.11	Are cylinder filling scales adequate? <ul style="list-style-type: none"> • Checked daily and regularly calibrated • Are check weights available • Is operation of auto cut-off satisfactory & consistent? 	Scales calibrated by NWS- Nuweigh sighted report number 140540-1 Scales are marked in field.
2.12	Cylinder filling hoses: <ul style="list-style-type: none"> • Is the cylinder filling hose to an approved specification? • In test – Yes • general condition satisfactory? • Cylinder filling connection: Check condition of fly nuts/bull nose/seals. • Filling platforms & railings: Is the condition of filling platforms and railings satisfactory? 	Visual inspection all ok
2.13	Cylinder prefill inspection carried out satisfactorily?	
2.14	Any other observations?	

3. HAZCHEM Storage (ref HIPAP#5_ 3.4.3 Storage)		
The report should include an inventory of all storage and process vessels and materials being stored/processed in them. The storage layout, condition of storage containers and associated equipment, drainage and containment systems and operator procedures should be considered for comment. Recommendations should be made where appropriate		
Nos	Question	Observation / Recommendation
3.1	Is there an up-to-date register of the hazardous chemicals used, handled or stored at the facility, does it align with bulk vessel & storage area's / volumes?	In Chemaalert OK
3.2	Is there an UpToDate Hazardous chemical Manifest?	OK – DG manifest sighted
3.3	Does the site have a 'HAZCHEM' Box or container in a suitable location, does it contain the site manifest, site plan and Emergency plan? Hazchem box must be as close as possible to the main entrance points or location agreed with emergency services.	Checked HAZCHEM box – contained up to date EMP / Manifest and fire services drawing
3.4	Can the site demonstrate that an appropriate review of placarding requirements has been made and there is appropriate placarding in place for bulk tanks and storage areas of packages/drums & Cylinders that exceed quantities in WHS Schedule?	<u>OK</u>
3.5	Are all fuel cylinders separated from oxidizing cylinders (>3 meters)?	<u>na</u>
3.6	Confirm bulk storage <ul style="list-style-type: none"> • PSVs in test • Vessel inspections to AS3788 & certification in date 	IRIS ok confirmed
3.7	Confirm Bulk storage Level controls/alarms in function and tested	No records – see 4.3
3.8	Confirm Bulk storage TIMS test	Completed on weekly depot checks

	- Confirm all ESOV shut in less < 12 sec	
3.9	<i>Inspect storage vessels and pipework for satisfactory condition?</i> <ul style="list-style-type: none"> Any corrosion Protective Coating in good condition All pipework supported Bulk tanks foundations and supports stable Transfer hoses parking position 	OK
3.10	<i>Inspect fire protective coating for integrity if installed?</i>	OK
3.11	<i>Are vessel inspection routines completed on time and any actions managed to closure?</i>	OK
3.12	<i>Do all flanges under tank have flame impingement guards?</i>	OK
3.13	<i>Any other issues?</i>	n/a

4. Process control (ref_HIPAP#5_ 3.4.4 Process Control & 3.4.4.1 Process Control Computer Controls in Process Plants)		
The adequacy of process control systems, emergency systems and protection systems installed should be commented on. Where they have a major role in the facility, special reference should be made to computer control systems. A special audit of computer control systems, which requires specific expertise, may be recommended.		
Nos	Question	Observation / Recommendation
4.1	<i>Have Safety Critical Control Measures (SCCMs) been identified?</i>	NO
4.2	<i>Have performance standards and KPIs been established for the SCCMs</i>	No
4.3	<i>Are there clear documented functional description for process safety critical instrumented controls clearly identifying the function of the instrumented system, setting for alarms / trips etc and evidence of functional testing of all elements of the safety instrumented system?</i>	No Actions – <ol style="list-style-type: none"> Document the function description and test methodology for the SCCM Develop PASS/FAIL criteria for controls Conduct function testing to function description ensure the SCCM functions correctly Ensure captured/flagged as safety critical in maintenance system and regular testing frequency in place.
4.4	<i>Are Emergency shutdown system tested?</i> - All Emergency stops tested through to final elements e.g., valves closures - Are automated shutdown system tested on a regular basis e.g., automated gas detection shutdown - Alarm (including remote), beacons sirens tested etc	<u>YES – via weekly depot checks</u> <u>See elsewhere</u>
4.5	<i>Are records for SCCM's testing in place and satisfactory?</i>	<u>No see 4.3</u>
4.6	<i>If the instrumented system fails calibration / functional test is a Non-Conformance process documented and followed?</i>	<u>No process in place see 4.3</u>
4.7	<i>Are site computer system, DCS, PLC suitable protected from Cyber-attack?</i>	Based on Automation contractor (Garth's) email - multiple layers of defence

4.8	How is the need to override interlocks for maintenance controlled if applicable?	<u>NA</u>
4.9	Any other issues?	

5. Fire Safety (ref_HIPAP#5_ 3.4.5 Fire Safety)		
The audit report should comment on the full range of fire safety systems at the facility. All protective systems and automatic or manually activated suppression systems should be audited. The report should comment on the adequacy of incident recording/reporting systems at the facility and the performance of protection and emergency systems. A fire safety study consistent with the guidelines provided in Fire. Safety Study Guidelines may be recommended. A map showing the layout of fire fighting services should be included as an attachment to the report		
Nos	Question	Observation / Recommendation
5.1	Can the site demonstrate that the fire protection equipment is adequate for the types and quantities of hazchems at site? E.g., Fire safety study (Hipap No: 2) Quantity of water, foam and/or suppressant is available on-site is suitable for quantity and type of hazard?	Sighted Fire system checks on monitors and fire extinguishers
5.2	How is fire detection and protection system integrity maintained?	Contractor serviced
5.3	Has the hazardous area classification requirements been identified and implemented	Yes, hazardous area drawings and hazardous area dossiers (2 files in safety shelf) in place - electrical sign off sighted
5.4	How is the gas detection system integrity is maintained?	N/A portable monitors used
5.5	Is there a process for controlling ignition sources	Yes personnel inducted as to hazards, signage etc Permit to work process covers and "hot work" to be conducted on facility
5.6	Are any deluge system tested and records in place?	N/A not in place – bulk tank has fire retardant coating in place
5.7	Are all firefighting equipment i.e fire extinguishers, monitors, fire hoses etc in place and in test?	OK and tested
5.8	Are any safety showers in test?	OK
	Can site demonstrate that appropriate first aid and emergency facilities have been made available?	Sighted fires aid box and first aiders First aid box re supply managed under contract
5.9	Any other issues?	

6. Environmental Protection Systems (ref_HIPAP#5_ 3.4.6 Environmental Protection Systems)		
ELGAS SMS: SHE-114-Environmental Management		
Environmental protection systems to reduce or eliminate contamination of air, soil, surface water and groundwater systems should be evaluated. Additional monitoring of environmental parameters or a specialised audit of environmental systems may be recommended if appropriate.		
Nos	Question	Observation / Recommendation
6.1	Is there an environmental management / emergency plan, is it in date and regularly testes	Yes sighted Environmental plan V1.3
6.2	Have the required licences/approvals been obtained and are they current?	OK Sighted approval letter dated 23 October 2020 from NSW DOP, approval of Operational environmental management plan
6.4	Are hazchem storage and handling areas provided with controls to contain spills within workplace boundaries?	<u>OK</u>
6.5	Inspect any environmental response equipment to ensure satisfactory?	<u>OK</u>

6.6	Are spill compounds/bunds, and any associated drainage systems, free of any 2 or more chemicals that may react dangerously with each other?	<u>N/A</u>
6.7	Any other issues?	

7. Facility Security (ref_HIPAP#5_3.4.7 Facility Security)		
ELGAS SMS: SHE-116-Security Management		
Nos	Question	Observation / Recommendation
7.1	Are security system in place to prevent unapproved access <ul style="list-style-type: none"> Area Fenced and any gates locked or entry only approved personnel Access control systems in place CCTV / Patrols / Alarms etc. 	Fence in place – All access points locked or access only via swipe card CCTV in place
7.2	Are Security system tested /inspected i.e. <ul style="list-style-type: none"> - intruder alarms - Fences - Gates etc 	Alarms are only for the main building Fences and gates are inspected via the weekly depot checks
7.3	Is after hours security response satisfactory?	No – same issues as PK review with CB
7.4	Any other issues?	

8. Safety management systems (ref_HIPAP#5_TBC)		
I.SMS S&HE Management Commitment		
Nos	Question	Observation / Recommendation
8.1	Is there a current Safety policy at site and is it communicated	<u>OK</u>
8.2	Safety Objectives and KPI's been defined	<u>OK</u>
8.3	Have responsibilities and accountabilities for safety been defined and implemented?	<u>NO</u> Sighted Deport operations manager PD
8.4	Is the Safety Management System documented, available and up to date	<u>OK</u>
8.5	Is safety discussed and the chance for feedback from workers provided	Monthly safety meetings take place
8.6	Is there a clear Process Safety meeting structure where process safety issues, (MHF/Safety case actions if applicable), KPI's are discussed, documented, actioned and allocated?	NO – there are no KPIs' at this level of the business – check with CB
8.7	Is this communicated to senior management?	<u>? check CB</u>
8.8	Any other issues?	

9. Risk management (ref_HIPAP#5_TBC)		
SMS element - SHE-102-Risk and Hazard Management		
Nos	Question	Observation / Recommendation
9.1	Have Process safety risk assessment been carried out identifying key process safety risks and controls such as instrumented systems,	Copies of HAZOP/PHA viewed

	<i>equipment e.g. PSV, tasks/Procedures that prevent a major process safety event. Have these items been flagged in the CMMS & Training system as Process safety critical ?</i>	
9.2	<i>Is there an up-to-date hazard and risk register for the site?</i>	<u>OK</u> <u>OFI: You need to consider</u> <ul style="list-style-type: none"> - Consultation with fillers - Some of the controls not aligned with Hazard - Medium risks what additional controls were considered (SFARP?)
9.3	<i>Are risk assessment reviewed when:</i> <ul style="list-style-type: none"> • the control measures implemented are not effective. • before a change to the workplace is likely to give rise to a new or different risk to health and safety. • when a new hazard is identified; or • in accordance with any recommendation of the primary emergency services authority • as identified in consultation with workers or at the request of a HSR who believes a member of the work group represented by the HSR may be affected • Every 5 years 	Contained in sms risk assessment
9.4	<i>Are Safety Data Sheets (SDSs) available and current?</i>	<u>OK sighted Deport DG register SDS in here</u> OFI – mark the file as containing SDS's
9.5	<i>Any other issues?</i>	

10. Management of change (ref_HIPAP#5_TBC)		
SMS element - SHE-104-Management of Change		
Nos	Question	Observation / Recommendation
10.1	Is there a change management procedure in place, is it followed?	<u>OK</u> <u>Sighted MOC #850</u>
10.2	What changes have been recorded since the last Hazard Audit, is there MOC documentation for the change, is it complete?	
10.3	Are MOC being conducted for Operational and organization changes as well as engineering changes?	
10.4	Is there a KPI for MOC, Is site meeting the performance standard?	
10.5	<i>Any other issues?</i>	

11. Safe system of work (ref_HIPAP#5_TBC)		
SMS element - SHE-108-Safe Systems of Work		
Nos	Question	Observation / Recommendation
10.1	<i>How is non-standard tasks assessed and managed?</i>	Via Elgas PTW process
10.2	<i>PTW system in place and used – sample for completeness</i>	OK

10.3	Are management conducting PTW reviews, recording issues and actioning them?	<u>Not started as yet and small number of PTW issued</u> OFI – ensure PTW checks take place by management on a regular basis
10.4	Any other issues?	<u>NO</u>

11. Contractor Management (ref_HIPAP#5_TBC)		
<u>SMS element - SHE-111-Contractor Management</u>		
Nos	Question	Observation / Recommendation
11.1	Is there an approved contractor list for critical equipment and does the approval process ensure that the contractor is qualified/suitable to work on critical equipment?	National maintenance select contractor
11.2	Any other issues?	

12. Audits (ref_HIPAP#5_TBC)		
<u>SMS element - TBC</u>		
Nos	Question	Observation / Recommendation
12.1	Is there an internal audit program in place?	Yes sighted audit report completed on 12/2/2020
12.2	Are audit action management to closure?	Action are not formally captured Action: review action management and traceability of these actions
12.2	Any other issues?	

13. Plant Procedures, Records and Other Documentation (ref_HIPAP#5_2.4.1 Plant Procedures, Records and Other Documentation)		
<u>SMS element - SHE-113-Documentation Management</u>		
Nos	Question	Observation / Recommendation
13.1	Are there site wide SOPs in place, easily accessible and up to date?	<u>OK</u>
13.2	SMS document in place easily accessible and up to date?	<u>OK</u>
13.3	Can site demonstrate that consultation took place in the developemnt of these procedures?	<u>NO</u>
13.4	Confirm Hazardous area dossiers in place and maintained for Hazardous area equipment. (AS/NZS 60079.17: 2009 Explosive atmospheres/ A Verification Dossier must contain: 1. A schematic diagram of the zonal area classification. 2. The classification of the hazardous areas, and the standards used for the classification. 3. Equipment Group and Temperature Class of equipment. 4. Equipment Identification 5. Installation Documentation 6. Maintenance Documentation 7. Inspection Checklist: 8. Records of Equipment Selection Criteria: 9. Management Documentation 10. A Declaration of Conformity The dossier may be kept as a hard copy or in electronic form. A hard copy of the dossier must be available for examination by the inspecting authority.	Sighted Hazardous area dossiers on safety shelf
13.5	Permit to Work records kept?	<u>Yes</u>
13.6	Is the isolation procedure up to date?	<u>N/A</u>

13.7	Is there a list of confined spaces? Is it up to date?	<u>n/A</u>
13.7	Can the facility demonstrate documented evidence of that the following processes included consultation with workers or their representatives? <ul style="list-style-type: none"> • Development of Safety management system • Risk assessments • MOC • MHF safety case as required • Emergency planning 	<u>YES – see safety shelf</u>
12.2	Any other issues?	

14. Operator Training (ref_HIPAP#5_2.4.2 Operator Training)		
SMS element - SHE-112-Training Management		
Nos	Question	Observation / Recommendation
14.1	Is there an induction program for new, transferred employees & contractors?	OK – inducted to site
14.2	Is there a training matrix/need analysis for operational personnel and managers? Are the safety critical training elements allocated, monitored, and completed?	<u>Review of [REDACTED] – cylinder filler</u> Review of TRN-ASM-067- ELG LPG filing / maintenance and depot safety assessment Training is against generic procedures, while site has developed site specific procedures could not sight evidence that Lachlan has been training in the site-specific procedures.
14.3	Are training records maintained?	Sighted [REDACTED] file
14.4	For process safety critical task where an operator response is required for an abnormal situation such as alarm response or ESD activation are the steps clearly documented e.g. in the procedure, alarm trip response document or trouble shooting guide	
14.5	Do line management conduct and record periodic task observations/interviews with operators to ensure safety critical steps are understood and carried out?	Sighted JPC taking place
14.6	Any other issues?	

15. Emergency Planning (ref_HIPAP#5_2.4.3 Emergency planning)		
SMS element - SHE-115-Emergency Management		
Nos	Question	Observation / Recommendation
14.1	Is there an up-to-date emergency plan in place – check for suitable located HAZMAT boxes	YES in place
14.2	Are personnel with key responsibilities in the Emergency plan trained in their duties i.e. Emergency coordinator, area wardens etc	Yes

14.3	Are at a minimum are annual emergency drills being conducted, against a credible event scenario and performance parameters (e.g. time taken to evacuate target) with a documented debrief taking place after the event ?	Yes Drill held OFI – add some performance criteria i.e time to evacuate < 5mins
14.6	Any other issues?	

15. Incident History (ref_HIPAP#5_2.5.1 Incident History)
SMS element - SHE-117-Incident Management

Nos	Question	Observation / Recommendation
15.1	Is there an incident reporting and investigation procedure?	Yes Interlex used
15.2	What incidents have occurred since last Hazard Audit- are they recorded and management in the incident database, root cause identified, and all actions addressed?	New site – no significant incidents
15.3	Any other issues?	

16. Risk Studies (ref_HIPAP#5_2.5.2 Previous Studies)
SMS element - SHE-102-Risk and Hazard Management

Nos	Question	Observation / Recommendation
15.1	What engineering projects were carried out during the audit period? Were appropriate risk studies conducted i.e. HAZOP, QRA etc?	Sighted PHA/HAZOP and fire safety study
15.2	Were appropriate Statutory approvals obtained for the project?	<u>DA approval and environmental approval sighted</u>
15.3	Have all actions from risk studies been addressed and closed?	Action_ need to review your HAZOP recommendations and ensure all elements completed up to functional descriptions for SIS, maintenance scheduled and PID updates In review Actions: 2/3/4/6 not completed on PID
15.4	Any other issues?	

16. SH&E Performance Monitoring (ref_HIPAP#5_TBC)
SMS element - SHE-101-SH_E Management Commitment

Nos	Question	Observation / Recommendation
15.1	Have KPIs been established for performance monitoring of all aspects of the SMS?	OFI_Check compliance to HSE 120 performance monitoring – not being completed SMS internal audits not being completed
15.2	Are poorly performing KI's identified and actioned?	See 15
15.4	Any other issues?	na

*Reference Documents

1. Hazardous Industry Planning Advisory Paper No 5 Hazard Audit Guidelines