Riskcon engineering

DG Report

Warehouse 4E, Oakdale West Industrial Estate, Kemps Creek NSW

Goodman
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Rev	Date	Remarks	Prepared By	Reviewed By
A	4th June 2021	Draft issued for comment	Jason Costa	Renton Parker
B	15th June 2021	Draft updated following review		
0	23rd June 2021	Final issued		
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Executive Summary

Background

Goodman is leasing a warehouse to a client in Oakdale West Industrial Estate, Kemps Creek NSW to house their storage and distribution operations. A review of their operations indicates a portion of their products contain ethanol concentrations exceeding 24% which results in a classification as a Class 3 Flammable Liquid under the Australian Dangerous Goods Code (ADG). The site is therefore subject to the Work Health and Safety Regulations 2017 (Ref. [1][1]) which requires the risks associated with the storage and handling of DGs and hazardous chemicals to be minimised to ensure safety for personnel working within the site. Compliance with the Regulation may be achieved by complying with an applicable design standard to the materials being stored.

Goodman has engaged Riskcon Engineering Pty Ltd (Riskcon) to prepare a DG assessment of the facility to ensure compliance with the applicable DG standards and thus the Regulation. This document represents the assessment of the DG storage at Goodman Warehouse 4E at Oakdale West Industrial Estate, Kemps Creek NSW.

Conclusions

A review of the class, quantity, and location of DGs stored at the Goodman site was conducted to assess the compliance of the storage with relevant Australian Standards and the NSW WHS Regulation 2017. Based on this review, it is concluded that the proposed storage will be compliant provided the design requirements set out in this report are incorporated.

Recommendations

The following recommendations have been made:

- The design requirements detailed within this report shall be adhered to in the development of the design for the facility.
- The DGs stored at the site are to be per the requirements of this report.
- A hazardous chemical (DG) register, DG manifest, DG notification, DG Risk Assessment, Placard Schedule, ERP/ESIP and HAC/HAVD should be prepared or reviewed as per the requirements of NSW WHS Regulation 2017.

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1.0 Introduction

1.1 Background

Goodman is leasing a warehouse to a client in Oakdale West Industrial Estate, Kemps Creek NSW to house their storage and distribution operations. A review of their operations indicates a portion of their products contain ethanol concentrations exceeding 24% which results in a classification as a Class 3 Flammable Liquid under the Australian Dangerous Goods Code (ADG). The site is therefore subject to the Work Health and Safety Regulations 2017 (Ref. [1]) which requires the risks associated with the storage and handling of DGs and hazardous chemicals to be minimised to ensure safety for personnel working within the site. Compliance with the Regulation may be achieved by complying with an applicable design standard to the materials being stored.

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1.2 Objectives

The objective of the DG Report is to review the storage and handling of DGs at the site to ensure compliance with applicable Australian standards and the WHS Regulations and provide recommendations in order to achieve compliance.

1.3 Scope of Services

The scope of work is to prepare a DG design assessment of the DG storages at the Goodman site located at Warehouse 4E in Oakdale Industrial Estate, Kemps Creek NSW. The assessment does not include any other sites nor additional work which may be identified in the course of the assessment.

To fulfil Riskcon's obligations under Section 19.1 and 19.2 of the WHS Act 2011, the design of the DG stores will be based on consultation with the user groups and the operations they foresee being undertaken in these spaces. If operations in the DG stores change in the future from those that the stores were originally designed to accommodate, Riskcon would need to reassess the facilities to ensure the new operations comply with the applicable codes, standards and regulations.

2.0 Methodology

2.1 General Methodology

The following methodology was applied:

- The site layout and proposed DG storage locations were reviewed against the applicable standards.
- The compliance requirements based on the applicable design standards for each store were reviewed and recommendations were made to ensure compliance with the appropriate standard.
- A draft report was prepared for review and comment by the project team.
- Any comments were incorporated into a finalised version.

3.0 Site Description

3.1 Site Location

The site is located at Warehouse 4E in Oakdale West Industrial Estate, Kemps Creek NSW which is approximately 36 km west of the Sydney Central Business District (CBD). **Figure 3-1** shows the regional location of the site in relation to the Sydney CBD. Provided in **Figure 3-2** is the layout of the site.

Figure 3-1: Site Location

3.2 Adjacent Land Uses

The land is located in an industrial area surrounded by the following land uses, which are adjacent to the site:

- North – Industrial warehousing
- South – Rural residential housing
- East – Industrial warehousing
- West – Emmaus Catholic College & Healthcare Village

3.3 General Description

The site consists of a gatehouse and weighbridge, a single large warehouse building (34,000 m^2), a main two-storey office with floor space of approximately 1,000 m^2, a 200 m^2 workshop and two dock offices on either side of the warehouse, one 95 m^2 and the other 200 m^2.

The entirety of the warehouse floorspace is to be general racking which will be fully protected by an Early Suppression Fast Response (ESFR) sprinkler system and full hydrant coverage as required by the BCA.

The site also contains 237 carparking spaces, 21 B-double trailer parking spaces and several large hardstand areas to the north-west and south-east sides of the main warehouse.

3.4 Quantities of Dangerous Goods Stored and Handled

A summary of the DG classes and quantities store on site have been provided in **Table 3-1**.

Table 3-1: Maximum Classes and Quantities of Dangerous Goods Stored

Class	Description	PG	Quantity (kg or L)	Subject to SEPP 33? (Y/N)
2.1	Flammable gas - LPG	-	720 L WC*	Y
3	Flammable liquids	II	87,000 kg	Y

*Water Capacity

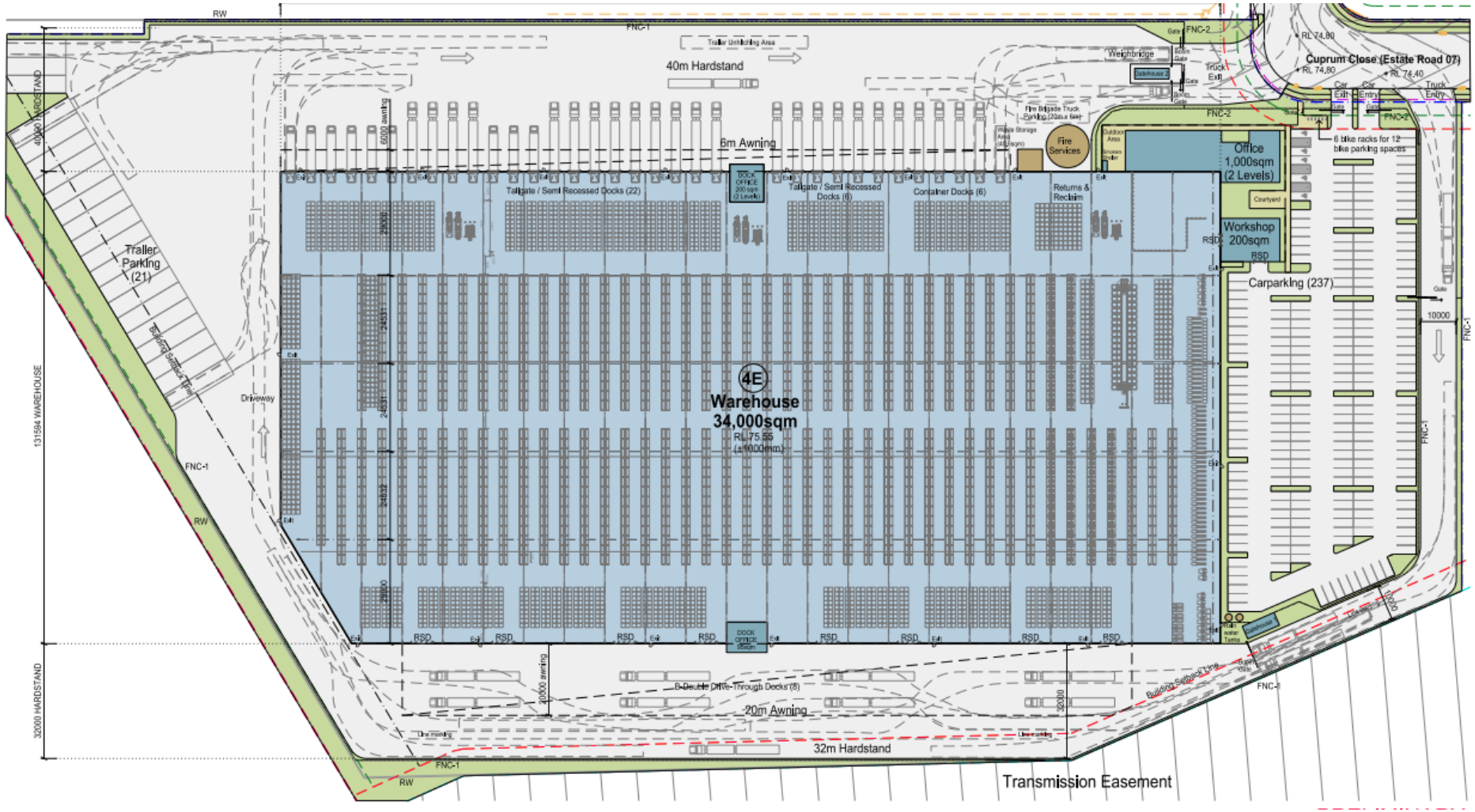

Figure 3-2: Site Layout

4.0 Assessment

4.1 Introduction

The warehouse operates as a Retail Distribution Centre (RDC) storing flammable liquids (potable spirits) in retail packages. Therefore, the applicable standard to be used for this warehouse would be AS/NZS 3833:2007 (Ref. [2]). Provided in the following section is an assessment of the facility against the standard. Additionally, a maximum of 40 LPG cylinders, each with a Water Capacity of 18 L may be stored external to the warehouse. The applicable standard to assess the storage of LPG is AS/NZS 1596:2014 (Ref. [3]) and the LPG storage location is shown in **Figure 4-1**.

4.2 AS/NZS 3833:2007 Compliance

Provided in the following subsections are the key requirements that must be included within the design of the warehouse to ensure compliance with AS/NZS 3833:2007 (Ref. [2]).

4.2.1 Design

- The warehouse shall be provided with adequate natural or mechanical ventilation, in order to disperse any dusts, mists or vapours. Ventilation for occupancy purposes according to AS/NZS 1668.2 (Ref. [4]) is considered adequate due to the low risk of vapours or gases being released in a retail store.
- Racks and shelves shall be structurally sound and designed for the maximum load to which they are to be subjected. They shall be constructed of materials that are unable to absorb liquids and compatible with the dangerous goods being kept.
- The design and installation of racking and shelving shall permit ready access to all stock and allow clear access for personnel. Dangerous goods shall be located so as to ensure that there are safe passages to exits and that exits are not blocked.
- All storage areas shall be appropriately secured against access by unauthorized persons and signed as follows:
    - RESTRICTED AREA, AUTHORIZED PERSONNEL ONLY.
- The means of entry into and exit from the areas, rooms or buildings where dangerous goods are kept or handled shall be kept clear at all times. At all times, access shall also be available to:
    - firefighting equipment.
    - personal protective equipment.
    - clean-up materials and equipment.
    - the place where the manifest is kept.
- The following housekeeping procedures need to be established and maintained:
    - The aisles of the store shall be kept clear.
    - In order to prevent accumulation of old material that could deteriorate and become a chemical hazard, stock integrity shall be monitored.

  - Liquids should not be stored above powders and solids. Liquids in glass bottles should be stored at lower levels.
  - Packages shall be stored in such a manner that leaks cannot affect other substances in the store.
  - All packages shall be handled with care so that the possibility of leaks is minimized.
  - Packages shall be regularly inspected and, when any signs of spill, leak or deterioration are observed, the suspect package shall be examined and rendered safe.
  - Minor spills or leaks of any dangerous goods shall be dealt with appropriately.
  - Packages should not be kept in direct contact with the floor.
- Fire protection: Based upon the quantity of liquids, Table 9.3 indicates the following minimum fire protection would be required:
  - Fire extinguishers (dry chemical, rated 2A 60 B(E)) located with maximum 15 m travel distance.
  - Fire hose reel coverage to all parts of the store.
  - Sprinklers are not required per Table 9.3; however, as they will be incorporated as part of the building design, they shall be designed to be able to protect the flammable liquids per AS 2118.1:2017.
- All spills and potentially contaminated fire water shall be contained within the site premises through the use of bunding and/or drainage isolation (i.e. slight rise at doorways around the warehouse or angle iron bunding around the racking of the flammable liquid storages).
- Storage of flammable liquids may only occur in the green designated area of **Figure 4-1** in order to comply with SEPP 33 separation requirements.
- The storage of flammable liquids shall not be kept near (within 3 m) any heating or ignition sources. A detailed Hazardous Area Classification is recommended to identify the potential for an explosive atmosphere and appropriate controls.
- Smoking shall not be permitted in retail distribution centres where dangerous goods are kept. Warning signs to prohibit smoking and to exclude other ignition sources shall be displayed at entrances to the retail distribution centre, e.g. DANGER: NO SMOKING, NO IGNITION SOURCES.
- Bollards, crash barriers or other suitable protective barriers shall be installed where there is a risk of the goods, racking or shelving being damaged by vehicular traffic, including fork-lift trucks. Such protective barriers shall be maintained in good condition.
- Appropriate placarding of DG stores. I.e., class label at the entrance to the storage area.

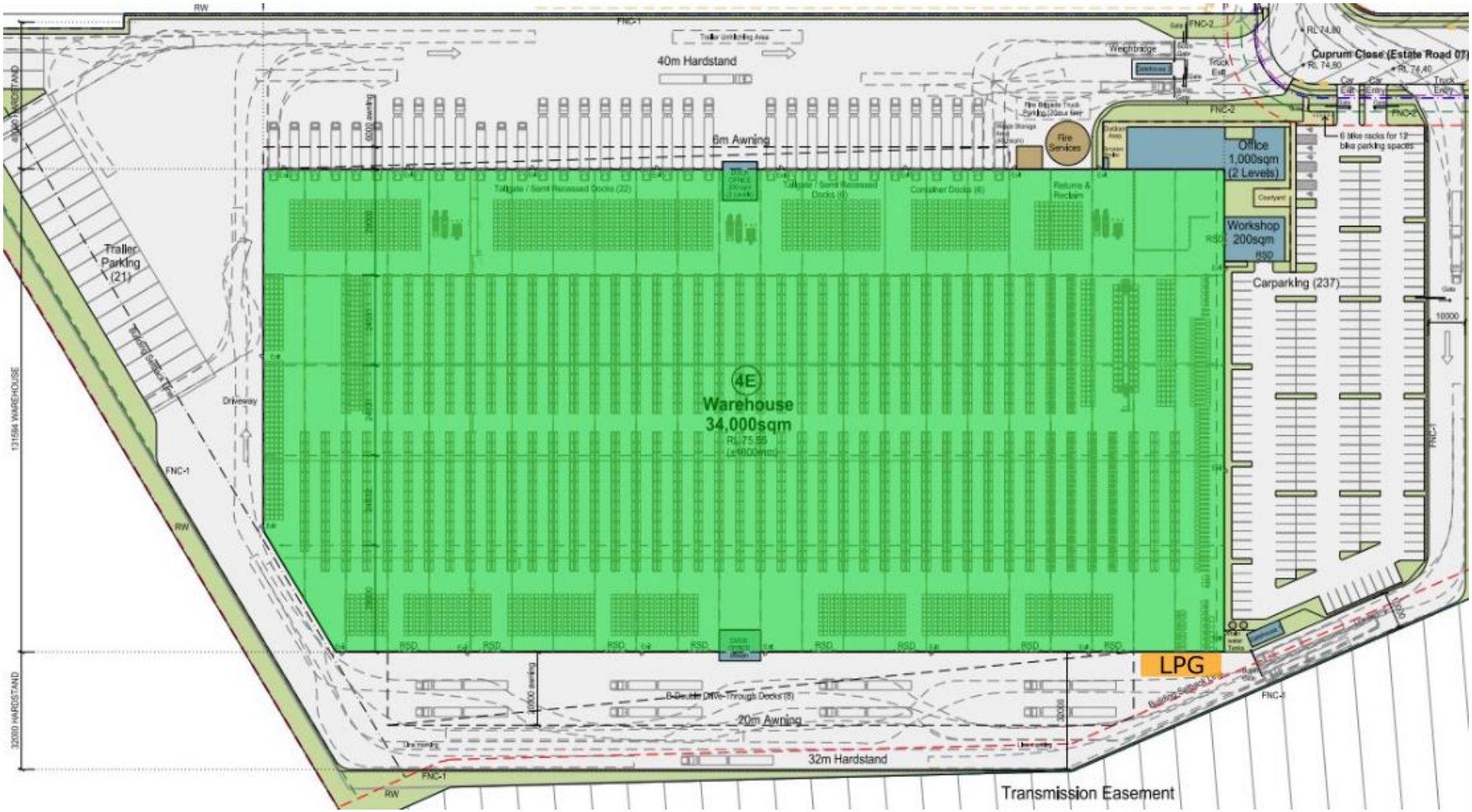

Figure 4-1: Allowable flammable liquid storage area (green) and LPG storage location

4.3 AS/NZS 1596:2014 Compliance

Provided in the following subsections are the key requirements that must be included within the design of the warehouse to ensure compliance with AS/NZS 1596:2014 (Ref. [3]).

4.3.1 Design

- The location shall ensure that cylinders are not liable to physical damage, tampering, or excessive temperature rise. This requirement shall not be taken to preclude storage in an open area, exposed to the sun.
- A cylinder shall be at least 1 m horizontally away from an opening into, and shall be outside of, any building that is not used solely for storage, filling and/or handling of gas cylinders.
- Cylinders shall be handled carefully and not allowed to fall upon one another or be otherwise subjected to undue shock.
- Cylinders shall be secured to prevent movement or physical damage. Valves shall be safeguarded against physical damage in accordance with AS 2473.
- Cylinders shall be placed so that the safety relief device will always be able to vent the vapour space.
- The storage shall be adequately naturally ventilated. Outdoor storage is considered adequate.

5.0 Work Health & Safety (WHS)

5.1 Introduction

In addition to the design requirements indicated by the standard, a Person Conducting a Business or Undertaking (PCBU) must satisfy several operational obligations outlined in the NSW WHS Regulation 2017 (Ref. [1]). The additional obligations are based on the quantity of dangerous goods stored on site. Based upon the storage of each Class of DG at the site, the site would be classified as a Manifest site as shown in **Table 5-1** and the following clauses will apply to the site.

Table 5-1: Placard and Manifest Thresholds

Class	Total Quantity (L or kg)	Placard Quantity (L or kg)	Manifest Quantity (L or kg)	Result
2.1	720	200	5000	Placard
3	87,000	250	2,500	Manifest

5.2 Clause 346

A Hazardous Chemicals [*Dangerous Goods*] register is to be prepared which must include;

- A list of hazardous chemicals stored, used or handled.
- The current Safety Data Sheet (SDS) for DGs stored, used or handled.

5.3 Clause 347

Prepare a manifest of chemicals in accordance with Schedule 11 of the Regulation.

5.4 Clause 348

Notify the regulator of the Hazardous Chemicals that exceed the quantities detailed in Schedule 11 of the Regulation.

5.5 Clause 349

An outer warning placard must be prominently displayed at the site. The placard is to show the words “HAZCHEM” in red lettering on white or silver background and is to have the dimensions as those shown in should have dimensions as shown in **Figure 5-1**.

In addition, the chemical store containing the hazardous chemical that exceed the placard quantity is to be designated with a placard. The placards shown in **Figure 5-2** will be required to be located at all entrances to the warehouse. It is noted that while the Regulation only requires a 100 mm x 100 mm Class placard, 250 mm x 250 mm is much more visible for emergency responders upon arrive at the site in the event of an emergency.

Figure 5-1: HAZCHEM Placard

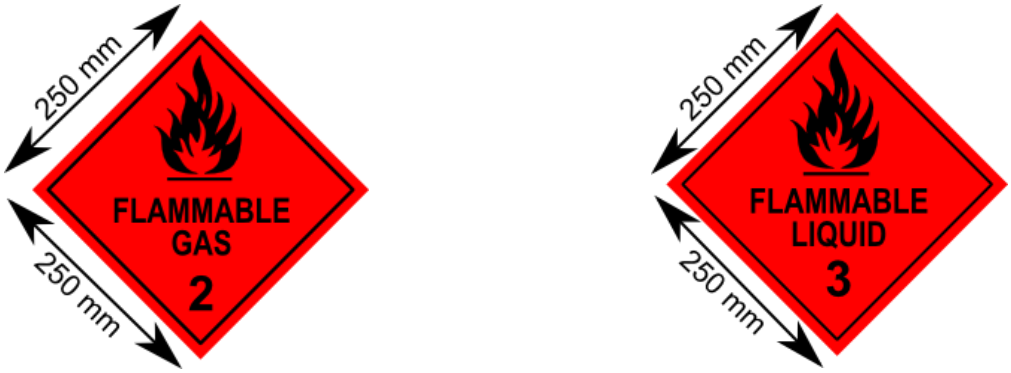

Figure 5-2: Relevant DG Placards

5.6 Clause 351

A PCBU must manage the risk to health and safety associated with using and storing a hazardous chemical [*Dangerous Good*] and have regard to the following:

- Hazardous properties of the chemical [Dangerous Good];
- Reactions between chemicals (physical) or between the chemical and other substances/materials;
- The nature of the work to be carried out with the hazardous chemical
- Any structure, plant or system of work used in the handling, generation or storage of the hazardous chemical [Dangerous Good] or that could react with the hazardous chemical [Dangerous Good] at the workplace.

In order to comply with this requirement, it is necessary to conduct a risk assessment and to identify those hazards and risks associated with the storage and handling of the hazardous chemicals [*Dangerous Goods*]. The following recommendation has been made

- A risk assessment of the hazardous chemical [*Dangerous Good*] storage areas be conducted, including the use of the chemicals in the manufacturing areas.

5.7 Clause 361

A PCBU must prepare an emergency response plan and submit to the primary emergency service organisation.

5.8 Clause 355

In areas where there is potential for vapours to accumulate the area is to be assessed. Therefore, the following recommendation has been made:

- A Hazardous Area Classification (HAC) report and associated drawings should be prepared for flammable liquid and aerosol storage in accordance with AS/NZS 60079.10.1:2009 (Ref. [5]) to ensure compliance with Clause 355.

In addition, to comply with the AS/NZS 3000:2007 (Ref. [6]) it is necessary to prepare a Hazardous Area Dossier which details the location of all electrical equipment installed within the hazardous zones in addition to certificates of compliance for the equipment. The dossier also documents any changes, maintenance, repair to equipment within the zone. Therefore, the following recommendation has been made:

- A Hazardous Area Dossier should be developed prior to occupation (if electrical equipment is located within the Hazardous Area).

5.9 Summary of Requirements

In summary, a Manifest site will require the following:

- A Dangerous Goods Register, indicating the type of chemical, any notations that may be required from the risk assessment and the Safety Data Sheet for the chemical.
- A Dangerous Goods manifest indicating quantities of DGs stored.
- A Dangerous goods notification to the Regulator.
- Placards and Signage as shown in **Figure 5-1** to be affixed to the site entrance and **Figure 5-2** to be affixed at the entrances to the warehouse.
- A risk assessment of the Dangerous Goods storage and handling areas.
- An Emergency Response Plan (ERP) and Emergency Services Information Package (ESIP).
- A hazardous area classification per AS/NZS 60079.10:2009.
- A hazardous area dossier (if electrical equipment is located within the zone).

6.0 Conclusion and Recommendations

6.1 Conclusions

A review of the class, quantity, and location of DGs stored at the Goodman site was conducted to assess the compliance of the storage with relevant Australian Standards and the NSW WHS Regulation 2017. Based on this review, it is concluded that the proposed storage will be compliant provided the design requirements set out in this report are incorporated.

6.2 Recommendations

The following recommendations have been made:

- The design requirements detailed within this report shall be adhered to in the development of the design for the facility.
- The DGs stored at the site are to be per the requirements of this report.
- A hazardous chemical (DG) register, DG manifest, DG notification, DG Risk Assessment, Placard Schedule, ERP/ESIP and HAC/HAVD should be prepared or reviewed as per the requirements of NSW WHS Regulation 2017.

7.0 References

[1] SafeWork NSW, “Work Health and Safety Regulation,” SafeWork NSW, Lisarow, 2017.

[2] Standards Australia, “AS/NZS 3833:2007 - Storage and Handling of Mixed Classes of Dangerous Goods, in Packages and Intermediate Bulk Containers,” Standards Australia, Sydney, 2007.

[3] Standards Australia, AS/NZS 1596:2014 - The Storage and Handling of LP Gas, Sydney: Standards Australia, 2014.

[4] Standards Australia, “AS/NZS 1668.2:2002 - The Use of Ventilation and Airconditioning in Buildings - Ventilation Design for Indoor Air Contaminant Control,” Standards Australia, Sydney, 2002.

[5] Standards Australia, AS/NZS 60079.10.1:2009 - Explosive Atmospheres Part 10.1: Classification of Areas, Explosive Gas Atmospheres, Sydney: Standards Association of Australia, 2009.

[6] Standards Australia, “AS/NZS 3000:2007 - Wiring Rules,” Standards Australia, Sydney, 2007.