

MANAGEMENT OF ELECTRICAL SAFETY IN HAZARDOUS AREAS AND/OR EXPLOSIVES HAZARDOUS AREAS

Introduction

1. A number of serious issues have been identified with the management of the safety of electrical installations in Hazardous Areas and Explosives Hazardous Areas within the Defence Estate. These areas are:
 - a. Hazardous Areas
 - (1) Areas with flammable gases, liquids and vapours
 - (2) Areas with combustible dusts
 - b. Explosives Hazardous Areas
 - (1) Explosives material/substances exposed to the atmosphere
2. For ease of reference for the remainder of this document, *hazardous areas* (in italics) is used to mean both Hazardous Areas and Explosives Hazardous Areas.
3. The issues:
 - a. The areas have not been identified or have not been identified correctly
 - b. The areas have not been recorded or recorded correctly
 - c. Some electrical equipment in these areas is unsuitable
4. There is a need to ensure that the areas have been correctly classified and the electrical installations have been correctly documented, installed and maintained.
5. *Hazardous areas* across the entire Defence Estate must be checked to verify compliance with the relevant legislation and regulations.
6. This document deals with the electrical safety compliance obligations of the Electricity Safety Acts and Regulations of the States and Territories and the broader obligations with the WHS Act and Regulations. Further information may be found in the WHS Codes of Practice.

Purpose

7. The purpose of this document is to provide a strategy for identifying and remediating non-complying electrical installations in *hazardous areas*. This is a necessary part of achieving compliance with the various State and Territory legislation relating to electricity safety and meeting obligations under the *Work Health and Safety Act 2011* (Cth) (**WHS Act**). Compliance with the legislation is important for all those involved with the *hazardous areas*.

General Requirement

8. There is a general requirement for all *hazardous areas* across the Defence Estate to be compliant with the requirements of the Commonwealth, State and Territory Legislation, and associated regulations.

Legal Advice

9. Defence has been advised by the Australian Government Solicitor that it should comply with State / Territory Electrical Legislation and that it will be difficult to demonstrate compliance with the WHS Act unless the electrical installations comply with these Electricity

Safety Regulations. It should be noted that Defence does not have the absolute right to be supplied with electricity. Failure to comply with Electricity Regulations may give an Electricity Provider cause to refuse to connect, or cause to disconnect, the electricity supply.

10. The legal implications for non-conformance are broad ranging and AGS has recommended that Defence, its officers and employees be mindful of the following possible outcomes:
 - a. criminal and civil liabilities under work health and safety laws and regulations and under the Queensland Electricity Act in the case of Queensland;
 - b. disconnection of, or refusal of connection to, electrical supply under the laws of all States and Territories; and
 - c. tortious liability (e.g. negligence claims) should an accident or incident eventuate as a result of the non-compliance that causes loss or damage.

11. AGS have recommended that, at a general level, Defence needs to ensure:
 - a. there is a system in place for ensuring the continuing safe operation of installations e.g. regular checks, reviews and audits;
 - b. factors that may compromise safe operation, including installations which do not comply with applicable standards, are identified and remedied at an early stage e.g. through maintenance by appropriately competent persons, replacement of parts as needed;
 - c. installations and hazardous areas are clearly marked and visible to those who are in or near them;
 - d. appropriate training and supervision is provided to those who work with and near electrical installations or perform electrical work, and
 - e. installations are prevented from becoming sources posing fire or electric shock risk.

12. Accordingly, electrical installations must be maintained to be safe as required under applicable State and Territory Electricity Legislation.

13. Even when the Commonwealth is not liable to be prosecuted for breaches of State and Territory electrical safety laws, individual APS employees, Defence members or contractors may be liable to prosecution for breaches of these laws.

Importance of Identifying *Hazardous Areas*

14. In order to properly discharge the applicable safety duties under the WHS Act, Defence needs to identify the safety hazards and risks arising from its operations.

15. Accordingly, it will be important to initially identify all *hazardous areas* on the Defence Estate. Guidelines on identifying *hazardous areas* are at Annex A provided as a series of flow charts. Refer also to the WHS Code of Practice - *Managing Risks of Hazardous Chemicals in the Workplace - July 2012 - Appendix I - Fire and Explosion Risks*.

16. Hazards associated with low frequency of occurrence but high consequence risk profile are precisely the hazards which must be identified in order to satisfy due diligence under the WHS Act. The absence of an incident does not necessarily indicate a high level of safety¹.

17. The State and Territory legislation (via AS/NZS 3000) places the responsibility for the classification of *hazardous areas* with the person or parties in control of the installation. Useful guidance is provided by the Electrical Safety Information Sheet published by the Queensland Government which advises the following in relation to the requirements of the Electrical Safety Act 2001 and Electrical Safety Regulation 2002:

Obligations and Responsibilities

The owner of the hazardous area installation must ensure that:

- *the installation is inspected, tested and found to be electrically safe by an accredited auditor before the installation is connected or reconnected to the electricity supply; and*
- *all requirements, as stipulated by the accredited auditor, are met and are maintained during the life of the installation; and*
- *the electrical contractor engaged can show competence to conduct the electrical installation work required; and*
- *all documents relating to the hazardous area, including any written notification from the accredited auditor, are placed in the 'Hazardous Area Verification Dossier'.*

The owner has the responsibility to:

- *accept or reject the design and equipment used in the installation, ensuring compliance with the legislative and Australian standard requirements; and*
- *accept the use of any particular equipment or method of installation in accordance with, and ensuring compliance with, legislative and Australian standard requirements, and to obtain advice on this from people competent to provide such advice; and*
- *maintain an up to date and accessible 'Hazardous Area Verification Dossier'.*

Competent Personnel

18. Electrical work within *hazardous areas* must only be carried out by persons with specific competencies for working in *hazardous areas*. These requirements are specified in the respective standards. It should be noted that numerous audits and reviews conducted by Infrastructure Division demonstrate that unless installers and maintainers are verifiably competent with respect to electrical installations within *hazardous areas*, the probability of the installation complying with the requirements of the standards and regulations is very low. The Commonwealth and State legislation makes it a responsibility for the person in control to ensure that only competent people carry out the work.

Disconnection of Unsafe Electrical Equipment

19. There are specific requirements related to “unsafe electrical equipment” contained in the Work Health and Safety Regulations and the Electricity Safety Regulations. In particular

¹ An example of this was the 1998 Longford disaster.

there is a requirement that any unsafe electrical equipment is isolated and disconnected from its electrical supply and, once it is disconnected, cannot be reconnected until it is repaired or tested and found to be safe or is replaced or permanently removed from use. Equipment is considered “unsafe” if there are reasonable grounds for believing it is not safe.

Verification Dossier

20. The owner of electrical equipment within a *hazardous area* is required to compile and retain a verification dossier related to the *hazardous area*. Area classification and zone diagrams, installation and maintenance instructions, record of maintenance and safety inspections should be included in the Verification Dossier. See annex D for detail on where *hazardous area* documentation is to be recorded within DRMS/Objective.

Signage and Control

21. Ensure the hazard is clearly defined and communicated to anyone before entering the *hazardous area*. As required by legislation and standards, warning signs, information sheets and line markings should be clearly displayed around and the *hazardous area* to ensure that everyone in the vicinity of the installation is aware of the hazard. Access to the *hazardous areas* must be controlled.

Identification and Recording of Hazardous Areas

22. The required actions are:

- a. Identify and record all *hazardous areas*. Also record areas that may be in doubt and require further confirmation. Compile a complete list of *hazardous areas* within each Defence Facility. See Annex B for guidance on the compilation and maintenance of *hazardous areas* Registers. Send this list to the appropriate senior manager(s) to keep them informed of potential hazard(s).
- b. Have any *hazardous areas* in doubt investigated by a Competent Person who can determine the nature and the extent of the *hazardous areas*. Inform appropriate manager(s) of the identified hazardous areas.
- c. Ensure all *hazardous areas* installations comply and upload the Verification Dossier into DRMS/Objective (see Annex D for guidance on DRMS/Objective). If there is an electrical installation inside the *hazardous area* and the installation is compliant, there will already be a Verification Dossier somewhere which contains the supporting evidence of compliance.

Verification of Hazardous Areas Compliance

23. The required actions are to ensure that:

- a. All the *hazardous areas* have been identified, recorded and classified correctly.
- b. All electrical equipment in *hazardous areas* comply with the appropriate methods of protection. Ensure installations located above and/or below *hazardous areas* are permitted and suitably protected. Report non-compliance to the appropriate manager.

- c. Actions are taken for non-compliant installations as set out in paragraph 24 below for non-compliant installations.
- d. Access is controlled to all *hazardous areas*. Ensure that all necessary measures are taken by those entering a *hazardous area*. This may include appropriate anti-static clothing, access control, appropriate signage/markings and exclusion of personal portable equipment that is battery operated including watches, hearing aids, cameras, remote controls, car keys, test meters, torches, power tools and mobile phones.
- e. Installation and maintenance activities in all *hazardous areas* comply.
- f. There are safe work procedures. This means controlling activities such as maintenance and repairs that may become an ignition source. Have written authorisation procedures to ensure that adequate control measures are taken. This would include hot work permits.
- g. All personnel entering these areas are *hazardous area* inducted. Ensure workers hold the required competencies and licenses where relevant.
- h. Records are kept of people who have been permitted to operate, maintain and alter the electrical installations in *hazardous areas* and that they are competent to do so.

How to Deal with Non-Compliant *Hazardous Area* Installations

24. The required actions for non-compliant *hazardous area* installations are to ensure that where:
- a. The electrical installation is essential to the operation, and the operation cannot be reasonably carried out elsewhere, then the installation shall be rectified in accordance with the requirements of the regulations and standards.
 - b. The electrical installation is not essential to the operation or the operation can be reasonably carried out elsewhere, then remove the installation.
 - c. The electrical installation is found to be non-complying and unsafe, it must be isolated and disconnected from the power supply.
25. A *hazardous area* installation is only considered complying and safe when there is objective evidence of this.

The Hierarchy of Control

26. The required approach to address any hazards identified in a workplace, which includes hazardous areas, is set out in the WHS Act. Figure 1 below, which is an extract from the Safe Work Australia Code of Practice *How to Manage Work Health and Safety Risks*, gives a graphical representation of the hierarchy of control that should be followed in complying with the WHS Act.

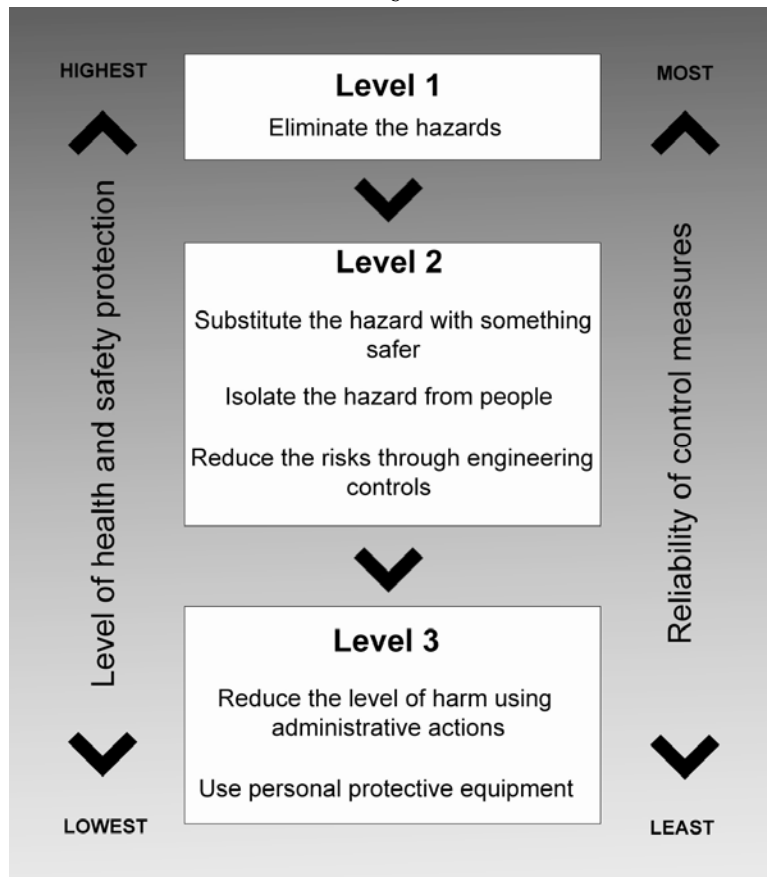


Figure 1 - The Hierarchy of Control

The above methodology may be applied for electrical installations in *hazardous areas*, by taking appropriate actions. Examples are as follows:

- a. Removing the hazard by not using the substances that give rise to the hazardous atmosphere in that installation. This could include use of water based paint in lieu of solvent based paint or consolidating activities and closing those no longer required.
- b. Remove the source of ignition. Examples are:
 - (1) Removal of unnecessary electrical installation from within the *hazardous area* or relocating the needed electrical installation outside the *hazardous area*.
 - (2) Alter the procedures so that electrical installation is no longer required inside the *hazardous area*.
 - (3) Use manual/hydraulics/pneumatics instead of electrics.
- c. Do the hazardous process at another complying installation.
- d. Isolate people from the hazard by controlling the process remotely.
- e. Reducing the extent of the *hazardous area*.
- f. Apply control measures that comply with the standards and regulations referenced by State Electricity Legislation and the standards and regulations of the Directorate of Ordnance Safety.

Management

27. Management are required to:
- a. Identify Persons in Control for each installation within the Defence Estate.
 - b. Provide resources to assist these people in identifying all *hazardous areas* under their control. The *hazardous areas* register template is at Annex B. As minimum, the basic actions outlined in paragraph 21 above should be undertaken.
 - c. Ensure all *hazardous areas* have appropriate signage clearly showing the extent of the *hazardous areas* and nature of the hazard.
 - d. Deal with non-complying installations as outlined in paragraph 24 above. Refer to Annex C for a simplified Corrective Action Guide.
 - e. Organise training. Training is an important component of identifying areas of non-compliance, implementing corrective action and maintaining compliance (Note: ADEFPO is separately commencing a Training Needs Analysis of all DSG staff involved in managing the Defence Estate).

Due Diligence

28. The Commonwealth needs to comply with its duties under the WHS Act in all circumstances, including Defence operations, by taking all reasonably practicable steps that would not be prejudicial to Australia's defence. In circumstances where stopping to make unsafe *hazardous area* installations safe would be prejudicial to Australia's defence, there needs to be evidence that this was considered at the time. This situation would need to be elevated and authorised at the appropriate level.

DEFPO Activities

29. DEFPO activities would include:
- a. DEFPO to arrange for the training of relevant Defence personnel in the relevant standard and enforcement of this brief.
 - b. DEFPO to arrange procurement of (and in the longer term determine the need for a panel of) competent auditors, consultants and trainers to provide persons in control with advice and assistance in the required auditing, training and rectification work.

DSRG Activities

30. DSRG activities would include:
- a. Infrastructure Division to raise awareness of the importance of having special competencies in place for any new works containing *hazardous areas* and the importance of achieving fully complying outcomes.
 - b. DEMTR and DSO to conduct ongoing random compliance audits nationally and regionally respectively to ensure that installations remain compliant.

Annexes and Appendices

31. The Annexes and Appendices are intended as an aid to achieving and maintaining compliance. Annex C is a more detailed Corrective Action Guide.

Original issue prepared by: DEEP and DEMTR in consultation with DEFPO

Cleared by: ASEPE

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Annexes:

- A. Guidelines for Identifying *Hazardous areas*
- B. *Hazardous Areas Register – Guidance on What Information to Gather*
- C. *Hazardous Areas Corrective Action Guide*
- D. *Hazardous Areas Guide to the Filing of Relevant Documentation*

Reference Documents:

- A. WHS Act
- B. Safe Work Australia draft Code of Practice - *How to Manage Work Health and Safety Risks*
- C. AGS Advice 28 June 2013 - Defence Fuel Farm Audit Outcome Management
- D. WHS Code of Practice - *Managing Risks of Hazardous Chemicals in the Workplace July 2012 - Appendix I - Fire and Explosion Risks*

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Glossary:

ANZEx: is the scheme for Certification of Equipment for Explosive Atmospheres in Australia. See <http://www.anzex.com.au/> for more information.

Classification: AS/NZS 3000:2007 Clause 7.7.2, AS/NZS 60079.10.1:2009, AS/NZS 60079.10.2:2012, AS/NZS 60079.20.1:2012.

Competency: as defined in AS/NZS 4761.1:2008.

Competent Person: as defined in AS/NZS 60079.14:2009, AS/NZS 60079.17:2009.

Electrical Equipment: defined in AS/NZS 60079.14:2009.

Electrical Installation: AS/NZS 3000:2007.

Ex: Used to identify the method of protection type of electrical equipment used in *hazardous areas*. AS/NZS 60079.14:2009 Tables 2.1 and 2.2.

Explosives / Explosives Ordnance: as defined in eDEOP 101.

Hazardous Area:

- a. **Hazardous Area:**
 - (1) Areas with flammable gases, liquids and vapours
 - (2) Areas with combustible dusts
- b. **Explosives Hazardous Areas**
 - (1) Explosives material/substances are exposed to the atmosphere

IECEX: International Electrotechnical Commission certification scheme for Explosive Atmospheres. See <http://www.iecex.com/> for more information.

Licence: From the State or Territory Electricity Safety Regulator to carry out electrical work under the relevant Act and Regulations.

Manual of Infrastructure Electrical Engineering (MIEE): the primary Defence policy document when determining electrical engineering requirements for Defence facilities and infrastructure.

WHS Act: is the Work Health and Safety Bill (Cth) that was introduced into the House of Representatives on 6 July 2011 and which is expected to commence operation on 1 January 2012. See <http://www.deewr.gov.au/WorkplaceRelations/Pages/CWHandSafetyBill.aspx> for more information.

eDEOP 101: Defence Explosive Ordnance Publications 101

see; <http://intranet.defence.gov.au/home/documents/data/DEFPUBS/DEPTMAN/edeop101/>

Owner: the person or organisation who has legal ownership of the installation which allows for the existence of the *hazardous area*.

Person(s) in Control: is the person (or persons) who control the *hazardous area*. This would normally be the owner and/or operator of the facility.

Static Electricity: As defined in AS/NZS 1020.

Zone: Each *hazardous area* is classified as comprising of one or more Zones based upon the frequency and duration of the occurrence of explosive gas/air mixtures, explosive dust/air mixtures or Explosives. See AS/NZS60079.10.1:2009 Clauses 3.6-3.8 and AS/NZS 60079.10.2:2011 Clause 6.2.

ANNEX A TO
MANAGEMENT OF ELECTRICAL SAFETY IN *HAZARDOUS AREAS*

GUIDELINES FOR IDENTIFYING *HAZARDOUS AREAS*

Identify a *Hazardous Area*

1. *Hazardous areas* are areas where flammable gases, vapours, liquids, or combustible dusts, fibres or flyings may occur in dangerous quantities and where explosives materials/substances are exposed to the atmosphere.

How to Recognise *Hazardous Areas*

NOTE: No one should be permitted to access these *hazardous areas* without the appropriate awareness training (specific to each individual *hazardous area*) or unless under the direct supervision of an appropriately Competent Person. Necessary control measures will include appropriate anti-static clothing, access control, appropriate signage/markings and exclusion of personal portable equipment that is battery operated including watches, hearing aids, cameras, remote controls, car keys, test meters, torches, power tools and mobile phones.

2. Three types of *hazardous areas* are recognised as follows:

- Hazardous Areas (gas or vapour) in which an explosive atmosphere is present, or may be expected to be present, in quantities such as to require special precautions for the construction, installation and use of the equipment.
- Hazardous Area (dust) in which combustible dust in cloud form is, or can be expected to be present, in quantities such as to require special precautions for the construction and use of equipment in order to prevent ignition of an explosive dust/air mixture.
- Explosives Hazardous Areas – An area in which explosives material/substances of Explosives Ordnance are exposed to the atmosphere such that they require special precautions for the construction and use of equipment in order to prevent ignition of an explosives material/substance.

3. Classification and examples of flammable gas and vapour Hazardous Areas are provided in AS/NZS60079.10.1:2009.

4. Classification and examples of combustible dusts Hazardous Areas are provided in AS/NZS60079.10.2:2011.

5. The responsibility for the classification of a *hazardous area* rests with the Persons in Control of the installation. However, the actual process of Classification requires specific Competencies to do so. Classification may be undertaken by a competent third party engaged by the Person in Control of the *hazardous area*. Refer to AS/NZS 3000:2007 (Clause 7.7.2.1) for more information.

7. The Department of Defence has its own standards relating to electrical safety in installations containing explosives ordnance eDEOP 101. Vapours and gases from explosives and dusts from explosives already have the oxidiser, so they do not need to mix with air. This means they are explosive in any quantity.

Check Lists for Typical *Hazardous Areas*

8. The following is a list of some of the typical *hazardous areas*. The list is not exhaustive. Other areas that are suspected of giving rise to flammable gases, vapours, liquids or combustible dusts need to be assessed.

- Flammable liquid cabinets (normally do need appropriate signage and exclusion markings but not a Verification Dossier if there is no electrical installation in the associated Hazardous Area).
- Explosives Areas.
- Vehicle workshops.
- Vehicle parking and standing areas (mainly underground or otherwise enclosed such that ventilation is restricted).
- Fuel dispensing stations.
- Fuel storage tanks and ventilation pipes from storage tanks.
- Pollution control equipment.
- Waste collection storage vessels, drains, sumps or pits.
- Aircraft hangars and refuelling areas.
- Above ground fuel storage tanks.
- Underground fuel storage tanks.
- Packaged fuel storage.
- Fuel loading.
- Waste liquids collection and drainage.
- Gas equipment.
- Fume cupboards and laboratories.
- Flammable medical agents.
- Anaesthetising areas.
- Sewage treatment.
- Surface coatings and adhesives.
- Finishing processes (paint and lacquer).
- Vessels containing flammable liquid.
- Degreasing, cleaning processes.
- Ammonia systems.
- Refineries.
- Grain silos, dust hoppers, bag emptying station, cyclone and filter as part of a suction extraction system.

For further examples, refer to WHS Code of Practice - *Managing Risks of Hazardous Chemicals in the Workplace - July 2012 - Appendix I - Fire and Explosion Risks*.

Common Hazardous Areas in the Defence Estate

9. The most common *hazardous areas* in the Defence Estate appear to be:

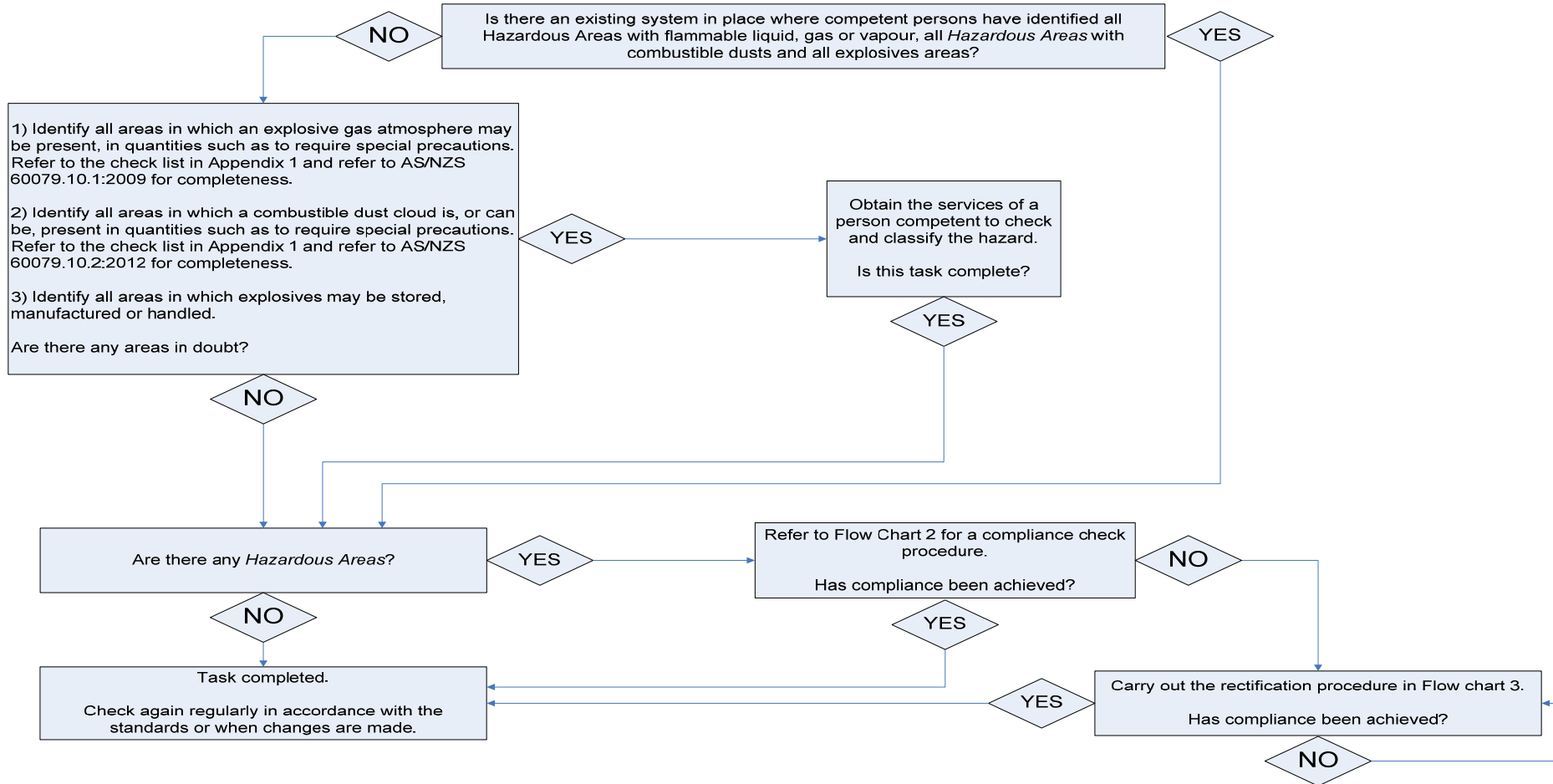
- Flammable liquids cabinets and stores.
- Flammable liquid decanting areas.
- Paint and lacquer spray cabinets
- Paint and lacquer spray rooms
- Degreasing and cleaning areas.
- Fuel dispensing facilities.
- Bulk Fuel Installations.
- Aircraft hangars.
- Explosives ordnance handling and processing.
- Fuel storage tanks (i.e. Ground Fuel).
- Waste treatment areas.
- Vehicle maintenance facilities.
- Fume cabinets.
- Gas storage tanks and equipment (see AS/NZS5601.1:2010 for more information on Gas Installations).

Appendices:

1. Flow Chart 1 – Identification of *hazardous areas*.
2. Flow Chart 2 – Compliance Check Procedure.
3. Flow Chart 3 – Rectification Procedure.

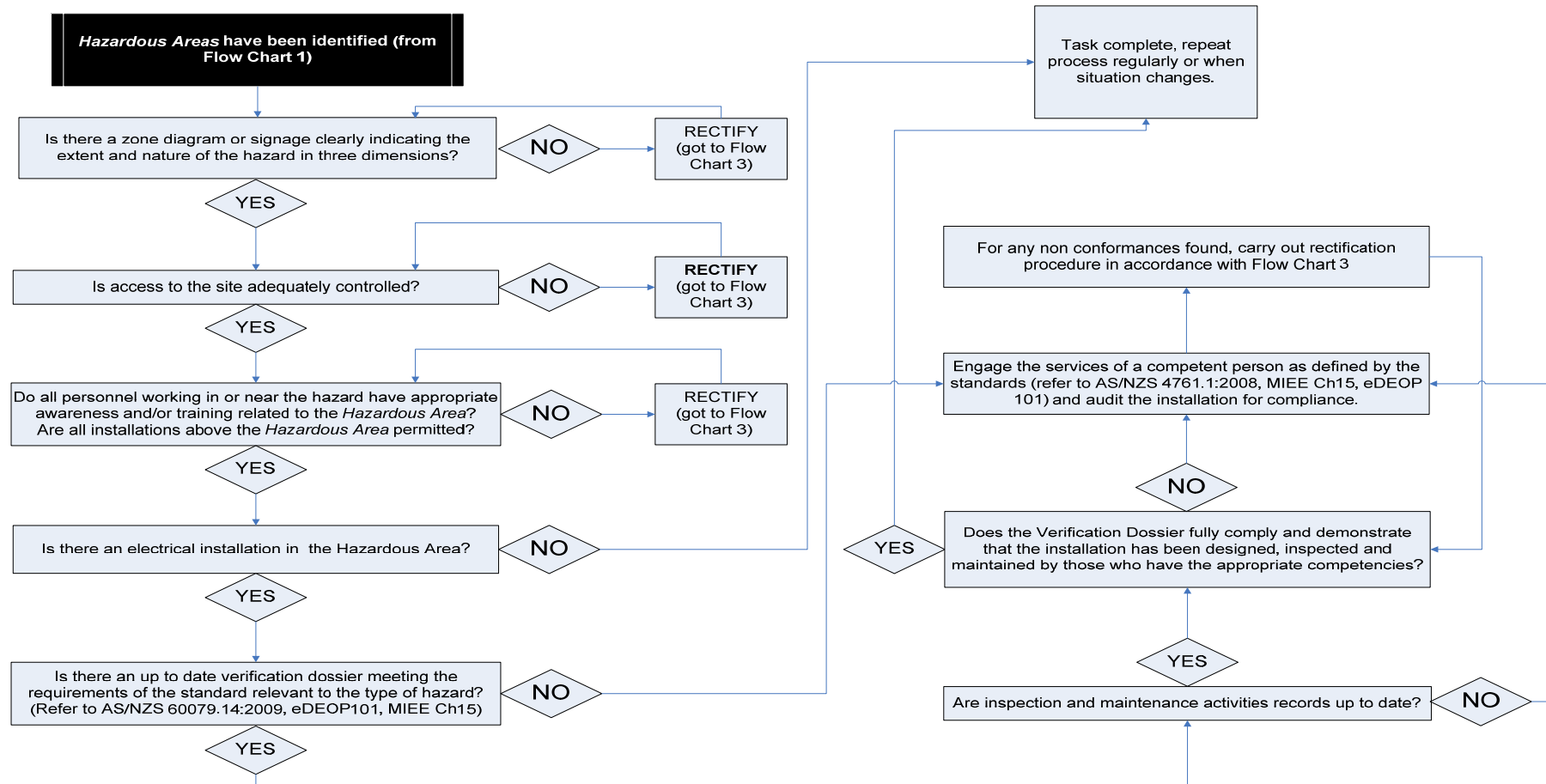
**APPENDIX 1 TO
ANNEX A TO
MANAGEMENT OF ELECTRICAL SAFETY IN HAZARDOUS AREAS**

**FLOW CHART 1
IDENTIFICATION OF HAZARDOUS AREAS**



**APPENDIX 2 TO
ANNEX A TO
MANAGEMENT OF ELECTRICAL SAFETY IN HAZARDOUS AREAS**

**FLOW CHART 2
COMPLIANCE CHECK PROCEDURE**



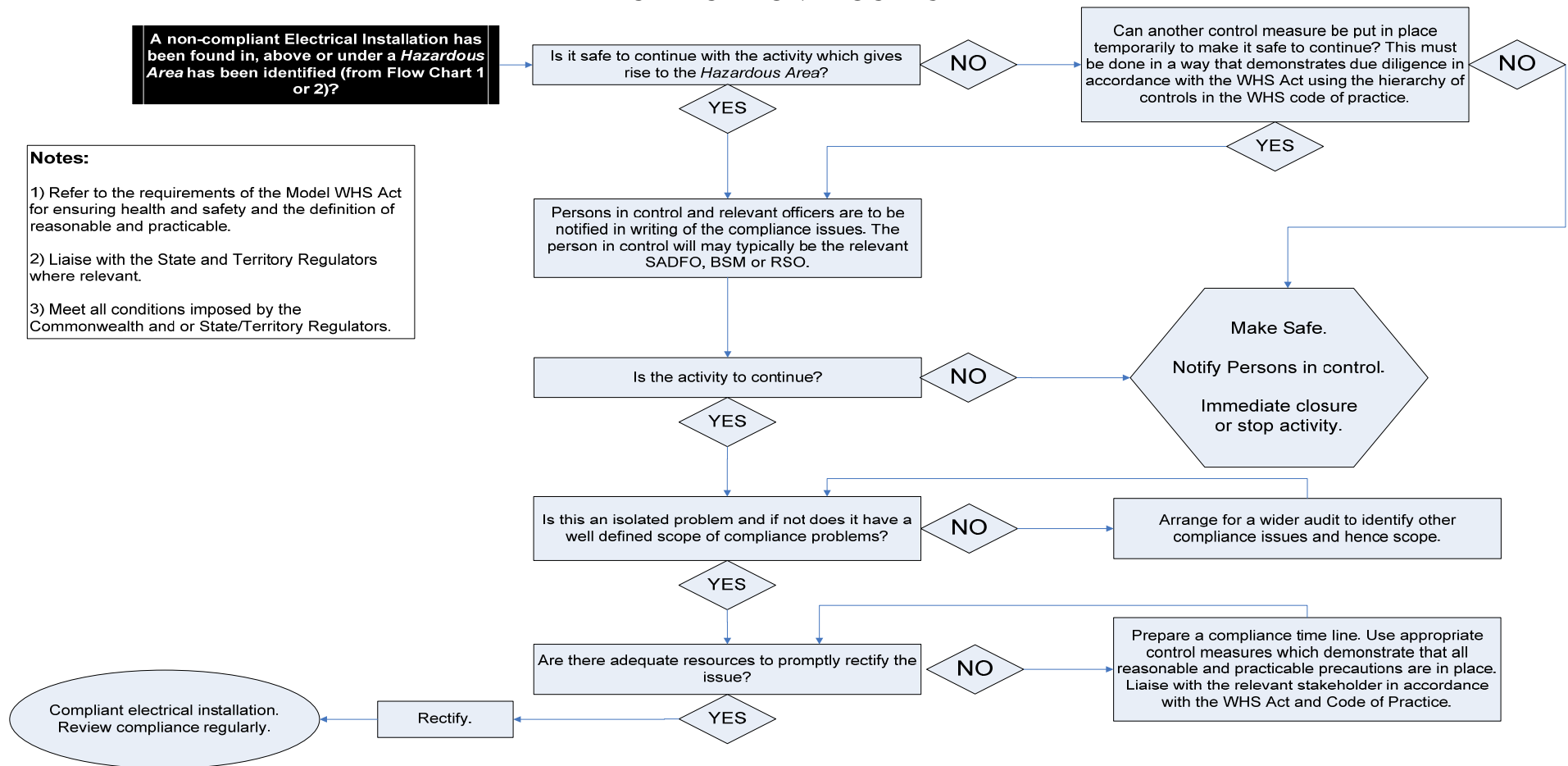
**APPENDIX 3 TO
ANNEX A TO
MANAGEMENT OF ELECTRICAL SAFETY IN HAZARDOUS AREAS**

**FLOW CHART 3
RECTIFICATION PROCEDURE**

A non-compliant Electrical Installation has been found in, above or under a Hazardous Area has been identified (from Flow Chart 1 or 2)?

Notes:

- 1) Refer to the requirements of the Model WHS Act for ensuring health and safety and the definition of reasonable and practicable.
- 2) Liaise with the State and Territory Regulators where relevant.
- 3) Meet all conditions imposed by the Commonwealth and or State/Territory Regulators.



ANNEX B TO

MANAGEMENT OF ELECTRICAL SAFETY IN *HAZARDOUS AREAS*

HAZARDOUS AREAS REGISTER – GUIDANCE ON WHAT INFORMATION TO GATHER

1. In order to be able to correctly identify and assess a *hazardous area*, information relating to the type of hazard and the facility the hazard is stored or processed in needs to be gathered and assessed. When populating the Estate *hazardous areas* Register (see *hazardous areas* Register (TEMPLATE) below) it is important to remember that initially it is not necessary to be able to determine if a suspected *hazardous areas* is in fact a *hazardous area* or not. Nor is it necessary to be able to determine initially if there are any Electrical Installations within the *hazardous area*. If an area is included on the Register because it is believed to be a *hazardous area* and it is later determined that it is not, then no safety issue is created. However if a *hazardous area* fails to be captured by the Register then there is a very real safety issue that arises from not knowing the existence and/or whereabouts and details of the *hazardous area*. For this reason the more information that can be gathered to help in determining the status of a potential *hazardous area* the better. Annex A to gives guidance on typical types of *hazardous areas*.
2. An individual *hazardous area* Register is required for each Defence base or facility across the Defence Estate. This is so that each base or facility has a complete list of all *hazardous areas* within its boundaries which can then be provided to all personnel who work at the base as well as contractors who arrive at the base to work temporarily. An additional advantage is that it is likely that the owner of one *hazardous area* within a base will be the owner of others on the same base, so it may help to encourage consolidation of *hazardous areas* within a given base to reduce maintenance and reporting burdens associated with multiple *hazardous areas*. Since electricity Acts may vary between States and Territories it is a requirement that each Register also identifies the State or Territory that the base is in rather than just the broader DS Region.
3. The first main section to consider for the Register is the Facility Type; here information regarding the Type of Hazard that exists (Vapour, Gas, Liquid, Dust or Explosives) is to be captured along with the inherent Characteristics of the Site (Portable or Fixed, Permanent or Temporary). This section captures the make-up of the *hazardous area* as described throughout these appendixes. If any of the types of hazard described throughout these appendixes can be identified then it is likely to be an area that requires further investigation in order to determine its status as a *hazardous area*.
4. The second main section of the Register is where all relevant information relating to the potential *hazardous area* can be input. The questions under the column header can be used for guidance on what information may be relevant.
5. The third and fourth main sections of the Register are the Location of the facility within the Base and the Organisation (Owner, Occupier and Person in Control) respectively. The information to be collected for these sections is to enable identification of where the potential *hazardous area* is such that relevant personnel can be informed of the hazard, and, so the owner of the facility, the occupier of the facility and the person in control can be readily identified and contacted.
6. Appropriate security classifications should be applied to each register. If required, classified information could be maintained on a separate classified register which is cross

referenced by the main unclassified register. This would allow the primary register for a base or facility to record all *hazardous areas* without containing classified information.

7. Once the relevant information is gathered and assessed and a facility is determined to contain a *hazardous area*, the information must then be maintained, stored and regularly reviewed in accordance with regulatory requirements. Additionally, the information must be made available to any person who will be working in or near the *hazardous area*.

8. See Annex D for guidance on how the information is to be kept (in DRMS/DEMS/GEMS) once compiled.

ANNEX C TO
MANAGEMENT OF ELECTRICAL INSTALLATIONS IN *HAZARDOUS AREAS*

HAZARDOUS AREAS CORRECTIVE ACTION GUIDE

1. The person(s) in control of an installation or facility needs to ensure that the following steps are done.
2. All *hazardous areas* are identified and documented in a competent manner. Refer to Flow Chart 1 at Appendix 1 to Annex A for guidance in identifying these areas.

Verification of *Hazardous Areas* Compliance

3. Verify compliance of the identified areas. A lack of any of the documentation as required by AS/NZS 60079.14:2009 and eDEOP 101 is an indication of a compliance problem that requires rectification. Refer to the Flow Chart 2 at Appendix 2 to Annex A for guidance on a compliance check procedure. A check list for verifying compliance is provided below. Ensure:
 - a. The area been classified and the information filed in a verification dossier.
 - b. All *hazardous areas* have appropriate signage clearly showing the extent of the *hazardous areas* and nature of the hazard.
 - c. Access to all *hazardous areas* is controlled. Ensure that all necessary measures are taken by those entering a *hazardous area*. This may include appropriate anti-static clothing, access control, appropriate signage/markings and exclusion of personal portable equipment that is battery operated including watches, hearing aids, cameras, remote controls, car keys, test meters, torches, power tools and mobile phones.
 - d. All electrical equipment in any *hazardous area* complies with the appropriate methods of protection. Ensure installations located above and/or below *hazardous areas* zones are permitted and suitably protected. Report non-compliance to the appropriate manager.
 - e. Installation and maintenance activities in all *hazardous areas* comply.
 - f. There are safe work procedures. This means controlling activities such as maintenance and repairs that may become an ignition source. Have written authorisation procedures to ensure that adequate control measures are taken. This would include hot work permits.
 - g. All personnel entering these areas are *hazardous area* inducted. Ensure workers hold the required competencies and licenses where relevant.
 - h. Records are kept of people who have been permitted to operate, maintain and alter the electrical installations in *hazardous areas* and that they are competent to do so.
 - i. Works contracts have the required specifications and checks for compliant outcomes.

- j. Maintenance contracts have the required specifications and checks for compliant outcomes.
- k. Installations undergo periodic safety inspections and maintenance in accordance with the regulations.
- l. Competencies are maintained up to date for all those working in and around *hazardous areas*; and
- m. Regular compliance audits are carried out as appropriate.

How to Deal with Non-Compliant Installations

- 4. The required actions when electrical installations inside hazardous areas are found to be non-complying are:
 - a. an electrical installation within a *hazardous area* that is found to be non-complying and unsafe must be safely disconnected from the power supply.
 - b. when the electrical installation is not essential to the operation or the operation can be reasonably carried out elsewhere, then appropriate action should be taken to isolate, make safe and permanently remove the installation/equipment.
 - c. when the electrical equipment is essential to the operation, and the operation cannot be reasonably carried out elsewhere, then the installation will require rectification in accordance with the requirements of the regulations and standards.
- 5. A *hazardous* area installation may only be considered complying and safe when there is evidence of this.
- 6. The required approach to address any hazards identified in a workplace, which includes when finding a non-conformance, is set out in the WHS Act and electrical legislation. Figure 1 below, which is an extract from the Safe Work Australia draft Code of Practice *How to Manage Work Health and Safety Risks*, gives a graphical representation of the hierarchy of control that should be followed in complying with the WHS Act.

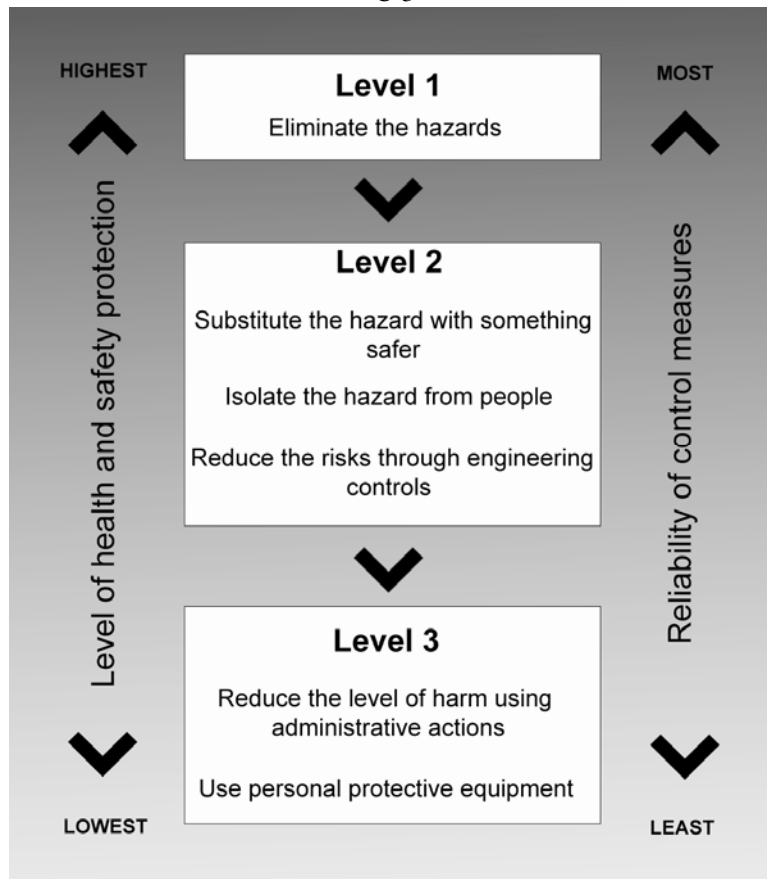


Figure 2 - The Hierarchy of Control

The above methodology may be applied for electrical installations in *hazardous areas*, by taking appropriate actions. Examples are as follows:

- a. Removing the hazard by not using the substances that give rise to the hazardous atmosphere in that installation. This could include use of water based paint in lieu of solvent based paint or consolidating activities and closing those no longer required.
- b. Remove the source of ignition. Examples are:
 - (1) Removal of unnecessary electrical installation from within the *hazardous area* or relocating the needed electrical installation outside the *hazardous area*.
 - (2) Alter the procedures so that electrical installation is no longer required inside the *hazardous area*.
 - (3) Use manual/hydraulics/pneumatics instead of electrics.
- c. Do the hazardous process at another complying installation.
- d. Reducing the extent of the *hazardous area*.
- e. Apply control measures that comply with the standards and regulations referenced by State Electricity Legislation and the standards and regulations of the Directorate of Ordnance Safety.

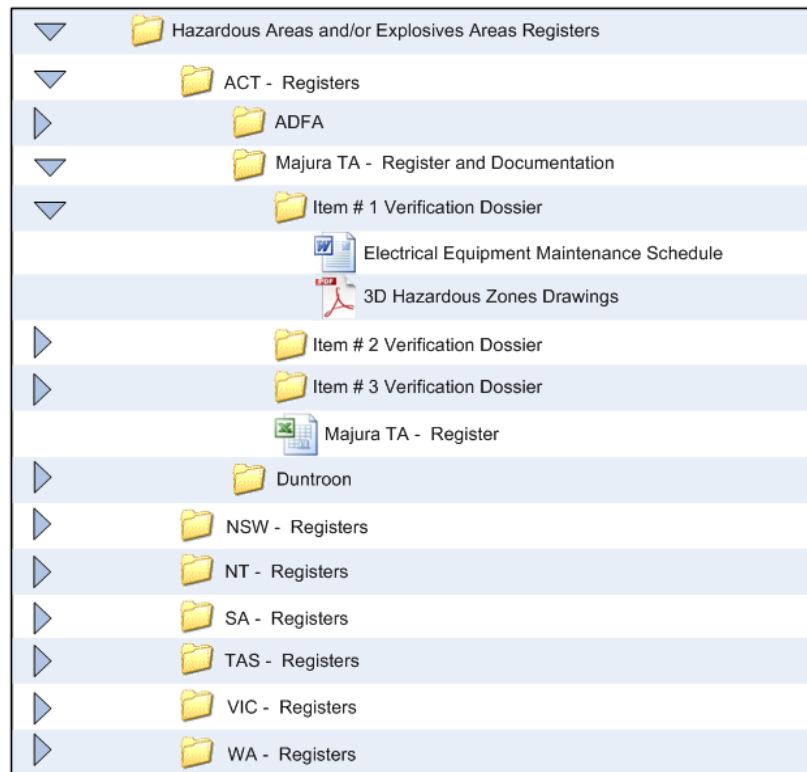
7. The Commonwealth needs to comply with its duties under the WHS Act in all circumstances, including Defence operations, by taking all reasonably practicable steps that would not be prejudicial to Australia's defence. The effect of this is not to authorise unsafe

work or inaction. In circumstances where stopping to make unsafe *hazardous area* installations safe would be prejudicial to Australia's defence, there needs to be evidence that this was considered at the time. This situation would need to be elevated and authorised at the appropriate level.

ANNEX D TO
MANAGEMENT OF ELECTRICAL INSTALLATIONS IN *HAZARDOUS AREAS*

HAZARDOUS AREAS AND GUIDE TO THE FILING OF RELEVANT DOCUMENTATION

1. Defence Records Management System (DRMS) / Objective – DRMS/Objective will be used to store the populated *hazardous areas* Registers detailed in Annex B. DEFPO will advise on the location within DRMS/Objective where the *Hazardous Areas* Registers will be stored when available. See the figure below for guidance on the file structure for the relevant documents to be stored within DRMS/Objective.



2. Defence Estate Management System (DEMS) – Details of infrastructure and equipment that contributes to the existence of a *hazardous area* including electrical installations should be captured within DEMS. The following details should be included in DEMS, using the free text field if required, for each item of electrical equipment installed in a *hazardous area*:

- For each item of Electrical Equipment (including cabling and conduit), a link to the Item# in the relevant Register (see Annex B for guidance on the Registers);
- Any building or structure containing one or more *hazardous area* should state as such; and
- Information such as the Make/Model/Serial Number/Date installed of each item of Electrical Equipment should be recorded.

3. Garrison Estate Management System (GEMS) – The functionality to be built into GEMS is expected to capture each *hazardous area* as a precinct with links to all the appropriate infrastructure and equipment associated with the *hazardous area*. Further advice on GEMS will be provided when available.