CHAPTER 3

PHYSICAL HAZARD MANAGEMENT

OVERVIEW

301. Physical hazards in the work environment include noise, heat, cold, vibration, pressure, electricity and radiation. This chapter provides Defence policy on all these issues with the exception of radiation which, because of the nature of the hazard, is covered by a separate chapter (chapter 4) in DOHSMAN.

302. Specific policy guidance on this chapter is contained in the following annexes:

Annexes:
A. Management of Risks Associated with Plant
B. Occupational Noise Management in the Defence Organisation
C. Electronic and Electrical Hazards
D. Safe Techniques for Welding, Brazing and Soldering
E. Fire Safety
F. Thermal Comfort
MANAGEMENT OF RISKS ASSOCIATED WITH PLANT

SYNOPSIS:

Regulations to the OHS Act require the Defence Organisation (as an employer) to create a safe workplace that is free from risks associated with plant. This is achieved through the risk management process.

In addition, the Regulations require employers to apply for a licence to operate certain types of plant. The Defence Organisation is exempt from this provision (through the granting of a Joint Special Licence (JSL) by the Safety Rehabilitation and Compensation Commission). However, the granting of the JSL is subject to a number of conditions being met by Defence.

The effective implementation of the requirements of this annex will ensure Defence meets its duty of care and joint special licence requirements.

REFERENCES

1. Defence

2. Other
   • Occupational Health and Safety (Commonwealth Employment) (National Standards) Regulations, Part 4—Plant

3. Cross Reference
   • Chapter 1, annex B—Regulations and Codes of Practice
   • Chapter 1, annex H—Risk Management
INTRODUCTION

1. The Occupational Health and Safety (Commonwealth Employment) (National Standards) Regulations, Part 4—Plant (the Regulations) came into effect on 1 July 1996. The Regulations require the Defence Organisation (as an employer) to create and maintain a safe workplace that is free from risks associated with plant. This is achieved through a process of systematically identifying hazards and assessing and controlling risks.

2. In addition to imposing duties on employers, the Regulations impose duties on manufacturers, suppliers, erectors, installers and commissioners of plant as outlined below:

a. Manufacturers. Manufacturers have a duty to identify hazards associated with the plant; assess the risks of identified hazards; eliminate the risks; notify the person who commissions the plant of the risks; and provide the employer with information concerning the safe use of the plant.

b. Suppliers. Suppliers have a duty to eliminate or minimise the identified risks arising from the use of plant; inform the employer of the safe use of the plant; inspect and test leased plant; keep records of such testing of leased plant; and provide the employer with those records.

c. Erectors and installers. Erectors and installers of plant have a duty to identify hazards associated with plant; assess the risk of identified hazards; and eliminate or minimise those risks.

d. Employers. Employers have a duty to identify hazards relating to the use, installation, erection, commissioning of plant; assess the risks associated with identified hazards; eliminate or minimise those risks; maintain control measures; implement safe systems of work; provide and maintain personal protective equipment; repair unsafe damaged plant; store and dispose of plant in a safe manner; provide training, information and instruction to employees exposed to risk; and to make available and keep records concerning tests, maintenance and inspection of plant.

3. The Regulations require employers to apply for a licence to operate the types of plant listed in Appendix 1. The Regulations make provisions for the Department of Defence (DoD) and the Australian Defence Force (ADF) as joint licensees, to apply separately for a joint special licence (JSL). If granted, the JSL exempts the Defence Organisation from the provisions of Regulations 4.41 to 4.54 inclusive. The granting of the JSL is subject to a number of conditions being placed upon, and met by, the Defence Organisation. When granted, a JSL is valid for four years. Appendix 2 provides details of the provisions of Regulations 4.41 to 4.54, which both the DoD and the ADF may be required to comply with should the joint JSL be cancelled, suspended or varied for any reason.

AIM

4. The aim of this annex is to provide guidance to Program Managers to ensure that the Defence Organisation meets its obligations under the Plant Regulations and in particular, fulfils the conditions imposed upon it for the granting of a JSL.
FINANCIAL CONSIDERATION

5. The fee for the JSL during its initial four years of operation will be met by Head Defence Personnel Executive (HDPE). Any other expense incurred in implementing this annex are the responsibility of the respective Programs.

DEFINITIONS

6. The following definitions are to apply for this annex:

   a. **Defence Organisation.** The ADF and the DoD;

   b. **Employee.** Refers to a member of the ADF or an Australian Public Service employee employed by the DoD;

   c. **Hazard.** A potential cause of injury or illness;

   d. **Plant.** Plant means any machinery, equipment, tools, and any component thereof. An item of plant includes items diverse as boilers, conveyors, lifts, cranes, ladders, power tools, lawn mowers, wheelbarrows, computers, freezers, and electric knives; and

   e. **Risk.** Risk means the probability against the consequences of occurrence of injury or illness.

RESPONSIBILITIES

Head Defence Personnel Executive

7. HDPE is responsible for:

   a. coordinating the application for the JSL;

   b. consulting with involved unions as required by the Regulations in relationship to the JSL;

   c. coordinating the collection of information from the Program required for the application, renewal, variation of an application, for a JSL;

   d. applying for any variation to the JSL;

   e. applying for renewal of the JSL. The application for renewal of a JSL is to include a list of the type of plant and the number of each type of plant held at the time of renewal;

   f. monitoring Program compliance with the provisions of the Regulations. (In accordance with the Joint Directive (No. 3/1993) by the Chief of the Defence Force and the Secretary of the DoD which tasked HDPE with the responsibility for performing the duties assigned to them as employing authorities under the Act).
8. The Director Defence Occupational Health and Safety (DDOHS) is responsible for:

a. the coordination of returns which are required under the Regulations, from Defence Estate Organisation (DEO) and Support Command Australia (SCAUST);
b. the coordination of any variations to the JSL;
c. provide information to the Safety Rehabilitation and Compensation Commission (SRCC) on plant covered by the JSL as required under the Regulations;
d. provide advice to the responsible program's time frames for the provision of information required under the conditions of the JSL.

9. Head Defence Estate Organisation (HDEO) is responsible for those items of plant included under the JSL arrangements which are 'Fixed Items of Plant' which form part of the essential building services of building fabric at all establishments, units and bases. HDEO is responsible for providing (for each establishment/unit/base) the following information for plant and equipment for which they have management responsibility to DDOHS every twelve months:

a. contact officer details (appointment, address and telephone number);
b. number of plant items held by each establishment/unit/base during the reporting periods;
c. number of new plant introduced into the workplace during the reporting period;
d. number of plant items modified during the reporting period;
e. number of plant items disposed of during the reporting period; and
f. number of plant registered during the reporting period (including details of the system of registration).

10. Commander Support Command Australia (COMDSCAUST) is responsible for those items of plant included under the JSL arrangements which are classed as being 'Mobile Items of Plant' at all ships, establishments, units and bases. SCAUST is responsible for providing (for each ship/establishment/unit/base) the following information for plant and equipment for which they have management responsibility to DDOHS every twelve months:

a. contact officer details (appointment, address and telephone number);
b. number of plant items held by each ship/establishment/unit/base during the reporting periods;
c. number of new plant introduced into the workplace during the reporting period;
d. number of plant items modified during the reporting period;
e. number of plant items disposed of during the reporting period; and
f. number of plant registered during the reporting period (including details of the system of registration).
Defence Estate Organisation and Commander Support Command Australia

11. DEO and SCAUST are responsible for establishing and implementing procedures that will ensure compliance with the Regulations and this annex. DEO and SCAUST are to ensure that procedures include the following:

a. **Plant subject to the JSL.** (Appendix 1 provides details of plant subject to JSL), DEO and SCAUST are responsible for:

   1) carrying out maintenance and testing inspections, in accordance with the manufacturer's requirements and relevant Australian Standards, on the licensed plant at least once a year, or sooner if a need is identified by following an assessment undertaken in accordance with sub-subparagraph 12.i;

   2) keeping records of maintenance inspections which are carried out on licensed plant. The records must include a statement to the effect that each item of plant has been maintained in a safe condition and is safe to operate;

   3) establishing and maintaining a system within each Program for registering in-house plant designs. The system for registering in-house plant designs is to make provisions for recording individual plant designs (including such things as technical specifications and drawings) and design alterations. Details of those items of plant requiring registration or notification of design are provided at appendix 3. As stated in subparagraph 12.g., HOPE is responsible for monitoring compliance with the Regulations, however, the programs are to ensure that the system, once established, is audited annually. In addition, as part of the conditions of the JSL, the SRCC may audit the plant design registration system at a mutually convenient time;

   4) keeping a register that contains records of how each item of licensed plant is used. Appendix 4 provides details of the register. The register must be updated at least every 12 months or whenever an item of plant is relocated, modified, etc;

   5) notifying HOPE whenever licensed plant is altered, relocated, disposed of, or if there is a change of ownership; and

   6) notifying HOPE whenever new plant, subject to the licensing provisions of the Regulations, is acquired.

Commanders/managers

12. **All plant.** With respect to all plant (ie as defined in paragraph 9 and including plant which is subject to a JSL) commanders/managers are responsible for:

   a. protecting the health and safety of employees and others operating the plant;

   b. protecting the health and safety of those involved in commissioning and installing all plant;

   c. ensuring that plant is decommissioned, dismantled and disposed of in a manner consistent with provisions under the Regulations;

   d. provide training for all those who:

      1) operate, maintain, inspect or audit plant; and

      2) train others to operate, maintain, inspect or audit plant;

   e. developing safety procedures for individual items of plant;
f. supplying suitable personal protective equipment, where applicable;

g. identifying hazards associated with plant, assessing any risk resulting from identified
hazards and implementing appropriate control measures for the elimination of the
hazard or reduction of risks. Appendix 5 provides guidance on hazard identification,
risk assessment and control.

Note

A record of the identification, assessment and control procedure must be maintained.
Examples of how these records may be kept are provided at the appendices to appendix 5.

h. provide information to employees, and other involved persons, about the hazards and
risks associated with the plant, including how to manage the risks associated with the
use or operation of the plant;

i. ensuring that, when purchasing plant, the manufacturer provides information on:

(1) the systems of work necessary for the safe use of the plant;
(2) the knowledge, training or skill needed by a person inspecting, maintaining or
testing the plant; and
(3) relevant emergency procedures;

j. ensuring that the supplier of plant provides records/information relating to the item of
plant; and

k. ensuring that the plant is installed in a manner that is safe and without risk to the
health and safety of employees.

POWERS OF THE SAFETY, REHABILITATION AND COMPENSATION
COMMISSION

13. In accordance with the Regulations, the SRCC (through Comcare Australia) may:

a. monitor the performance of the Defence Organisation’s obligations under the JSL.
Monitoring may be in the form of audits or requests for information; and

b. audit the system of registration of plant at a mutually agreed time.

14. If the Defence Organisation contravenes a condition to which the JSL is subject, the SRCC
may:

a. cancel the JSL;

b. suspend the JSL (for a period not exceeding 12 months); and

c. vary the conditions of the JSL.

15. The monitoring procedures for plant are at appendix 6.

Note

If the SRCC cancels, suspends or varies the JSL, Defence may be prohibited from operating a
particular item of plant to which the JSL applies or may be required to comply with the provisions
outlined at appendix 2).
Appendixes:
1. Plant requiring licence in accordance with schedule 6, part 2 of the plant regulations
2. Plant licensing and design registration requirements—employer responsibilities
3. Items of plant requiring registration or notification of design in accordance with schedule 6, part 1 of the regulations
4. Plant register
5. Occupational health and safety risk management—plant
6. Plant monitoring/audit plan
PLANT REQUIRING LICENCE IN ACCORDANCE WITH SCHEDULE 6 PART 2 OF THE REGULATIONS

<table>
<thead>
<tr>
<th>PLANT TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BOILERS</strong> categorised as hazard level A, B, C or D according to the criteria identified in: Australian Standards (AS) 3920.1—“Pressure Equipment Manufacture—Assurance of Product Quality”.</td>
</tr>
<tr>
<td><strong>PRESSURE VESSELS</strong> that have a hazard level of A, B or C according to the criteria identified in AS 3920.1, with the exception of gas cylinders covered by AS 2630, LP gas fuel vessels for automotive use covered by AS 3509; and serially produced pressure vessels covered by AS 2971.</td>
</tr>
<tr>
<td><strong>TOWER CRANES.</strong>[^a]</td>
</tr>
<tr>
<td><strong>BUILDING MAINTENANCE UNITS.</strong></td>
</tr>
<tr>
<td><strong>AMUSEMENT STRUCTURES</strong> covered by AS 3533, with the exception of Class 1 structures.</td>
</tr>
<tr>
<td><strong>TRUCK-MOUNTED CONCRETE PLACING UNITS WITH BOOMS.</strong>[^a]</td>
</tr>
<tr>
<td><strong>MOBILE CRANES</strong> with a safe working load greater than 10 tonnes.[^b]</td>
</tr>
</tbody>
</table>

**Note**

[^a]: For the purposes of licensing, any reference to cranes and hoists in the above table excludes those that are manually powered, elevating work platforms or tow trucks.

[^b]:
PLANT LICENSING AND DESIGN REGISTRATION REQUIREMENTS—EMPLOYER RESPONSIBILITIES

Note
This appendix does not apply to the Defence Organisation where a joint special license has been granted under the Regulations.

1. The Regulations require employers to notify and register designs of in-house plant listed in schedule 5, part 1 (refer to appendix 3) with the Safety, Rehabilitation and Compensation Commission (SRCC).

Licensing requirements

2. If plant listed at appendix 1 is to be operated by employees at work, employers are to:
   a. apply for a licence, using a form approved by the SRCC, to operate an item of plant.

Note
One application form is required for each item of plant and once granted, a licence is valid for a period of four years.

b. pay a licence fee on each item of plant.

Note
Half the licence fee is payable within 14 days of being granted a licence and the remainder is payable on the second anniversary of the date the licence was issued. As at September 1996 the licence fee is $90 per item of plant.

c. comply with the conditions of a licence, namely:
   (1) an employer must ensure that evidence of the licence is displayed on or near the plant to which the licence relates; and
   (2) if the licence is renewed, the application for renewal must be accompanied by a written statement to the effect that the item of plant has been maintained in a safe condition and is safe to operate;

d. notify the SRCC within 21 days for a variation of the licence if the plant that is licensed is altered, relocated, there is a change in ownership, or the name of the employer has changed;

e. carry out an annual maintenance inspection on licensed plant (other than a tower crane);

f. carry out maintenance inspections on tower cranes at least once every three years and each time the tower crane is relocated; and

g. provide information to the SRCC about the maintenance of licensed plant as soon as practicable after the maintenance inspection is completed.
ITEMS OF PLANT REQUIRING REGISTRATION OR NOTIFICATION OF DESIGN IN ACCORDANCE WITH SCHEDULE 6, PART 1 OF THE REGULATIONS

<table>
<thead>
<tr>
<th>Item No</th>
<th>Description of Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pressure equipment, other than pressure piping, that have a hazard level of A, B, C or D, determined in accordance with Australian Standards (AS) 3920, part 1 'Pressure Equipment Manufacture—Assurance of Product Quality (ME/1/21 Standard AMBSC)'.</td>
</tr>
<tr>
<td>2</td>
<td>Gas cylinders covered by AS 2030.</td>
</tr>
<tr>
<td>3</td>
<td>Tower Cranes.(^{(a)})</td>
</tr>
<tr>
<td>4</td>
<td>Building maintenance units.</td>
</tr>
<tr>
<td>5</td>
<td>Hoists, with a platform movement in excess of 2.4 metres, designed to lift people.(^{(a)})</td>
</tr>
<tr>
<td>6</td>
<td>Work boxes suspended from cranes.</td>
</tr>
<tr>
<td>7</td>
<td>Amusement structures covered by AS 3533 ('Amusement Rides and Devices') other than class 1 structures.</td>
</tr>
<tr>
<td>8</td>
<td>Prefabricated scaffolding.</td>
</tr>
<tr>
<td>9</td>
<td>Boom-type elevating work platforms.</td>
</tr>
<tr>
<td>10</td>
<td>Gantry Cranes;(^{(a)}) (a) with a safe working load greater than 5 tonnes, or (b) designed to handle molten metal or dangerous goods.(^{(b)})</td>
</tr>
<tr>
<td>11</td>
<td>Bridge cranes;(^{(a)}) (a) with a safe working load of 10 tonnes, or (b) designed to handle molten metal or dangerous goods.(^{(b)})</td>
</tr>
<tr>
<td>12</td>
<td>Vehicle hoists.(^{(a)})</td>
</tr>
<tr>
<td>13</td>
<td>Mast climbing work platforms.(^{(a)})</td>
</tr>
<tr>
<td>14</td>
<td>Mobile cranes with a safe working load greater than 10 tonnes.(^{(a)})</td>
</tr>
</tbody>
</table>

Notes

(a) For the purposes of licensing, any reference to cranes and hoists in schedule 6 exclude those that are manually powered, elevating work platforms or tow trucks.

Plant designs

1. Employers are not to use plant listed in this appendix unless that plant has a current registration number which is issued by the Safety, Rehabilitation and Compensation Commission (SRCC).

2. An employer may apply to the SRCC for registration of the design of plant listed in this appendix. This process involves the submission of a written application form, which includes a representational drawing of the plant design; a statement signed by or for the manufacturer of the plant to the effect that the design of the plant complies with the provisions of the regulations that apply to manufacturers of plant; and a statement, by a design verifier, which states that this has been done.

   Note
   A design verifier is a competent, independent person who is responsible for advising whether the design of a plant complies with the provisions of the regulations.

3. Registration of a plant design is subject to the following conditions:
   a. evidence of design registration is to be displayed on or near the plant to which the design registration relates, and
   b. the registration number must be provided to any person who deals with the employer in relation to the plant.

4. The SRCC is to be notified whenever there is an alteration to the plant design and employees are not to use the item of plant until the SRCC has been notified. However, the SRCC does not need to be notified of an alteration which has been carried out by a person administering a State/Territory law that corresponds to the Act or the Regulations.
OCCUPATIONAL HEALTH AND SAFETY RISK MANAGEMENT—PLANT

1. The Regulations place an obligation on the Defence Organisation (as an employer) to manage risks associated with the use of plant in the workplace. This is to be achieved through a risk management process which includes hazard identification, risk assessment and, where a risk to the health and safety of a person has been identified, implementation of appropriate control measures.

2. Records, including methods used to identify hazards and assess the risks, as well as details of risk control measures introduced, are to be maintained.

HAZARDS ASSOCIATED WITH PLANT

3. Hazards associated with plant include:
   a. injury due to entanglement, crushing, trapping, cutting, stabbing, puncturing, shearing, abrasion, tearing or stretching;
   b. hazardous conditions arising from pressurised content, electricity, noise, radiation, friction, vibration, fire, explosion, temperature, moisture, vapour, gases, dust, ice, hot or cold parts; and
   c. injury or ill health due to poor ergonomic design.

4. Possible sources of hazards associated with plant include:
   a. condition of the plant (ie age, use, poor service and maintenance history, etc);
   b. suitability of the plant (ie is the plant being used for its intended purpose? Are accessories suitable? Is the plant stable?);
   c. location of plant (impact on the workplace, the safety of employees and other persons);
   d. possible misuse of plant, poor systems of work;
   e. plant failure (possible explosion, fragmentation, collapse of parts);
   f. incompetent/untained operators; and
   g. ineffective control measures.

RISK MANAGEMENT—PROCESS

Step 1—hazard identification

5. Hazard identification involves identifying all the possible situations or events where plant or associated systems of work could harm people. This may be achieved by:
   a. preparing a list of the plant used in the workplace;
   b. examining records to determine whether these reveal any hazards associated with plant;
c. conducting a workplace audit using a plant hazard inspection worksheet (refer to enclosure 1). The audit should focus not only on hazards associated with the item of plant but also the system of work; and

d. seeking the views of employees who work with plant, as they are familiar with the hazards associated with the particular item of plant they operate.

Step 2—risk assessment

6. If during step 1 a potentially hazardous event or situation is identified which may arise from plant in the workplace, these are to be assessed to determine the risk posed by each hazard. This is achieved by:

a. gathering information about each hazard identified. Sources of information include:
   (1) observation of the workplace, system of work, etc;
   (2) consultation with employees;
   (3) accident/incident, compensation and first aid records;
   (4) reports (e.g., Hazard Reports) from employees or supervisors;
   (5) maintenance logs of plant;
   (6) manuals provided with plant;
   (7) articles in Occupational Health and Safety newsletters/magazines; and
   (8) other agencies (e.g., Worksafe Australia, Comcare Australia, manufacturer, etc);

b. determining how many people are exposed to each hazard and for how long;

c. assessing the likelihood that the hazard will occur within the life of the plant. The likelihood may be defined as:
   (1) very likely—could happen frequently;
   (2) likely—could happen occasionally;
   (3) unlikely—could happen, but only rarely; and
   (4) highly unlikely—could happen but probably never will.

d. assessing the consequence of a hazardous event or situation. The consequence may include any of the following:
   (1) fatality;
   (2) major injuries (normally irreversible injury or damage to health);
   (3) minor injuries (normally reversible injury or damage to health requiring several days off work);
   (4) negligible injuries (first aid); and
   (5) damage to assets (i.e., buildings, other plant and equipment).
e. determining the seriousness of the risk associated with the hazardous event or situation. This may be done with the assistance of the risk table which is in enclosure 2.

7. Following a risk assessment the hazards identified should be prioritised so that those with a high risk rating are tackled first, followed by hazards with a medium risk rating and then those with a low risk rating. An example of a risk assessment worksheet is contained in enclosure 3.

Step 3—risk control

8. Where a risk to health and safety has been identified the next step in the risk management process is to determine the appropriate strategy to effectively control the hazards. Risks are to be controlled using the following control hierarchy. In many cases a combination of controls will be necessary to reduce the risk to a safe level.

a. Elimination/substitution. The best way to eliminate the hazard is to completely remove the plant or system of work. If elimination is not possible then it may be possible to substitute the plant or parts of the plant for other types which present a lower level of risk.

b. Isolation. Isolating the hazard allows for the physical separation of the hazard from the workplace. If the hazard cannot be eliminated then the separation of the hazard from employees, by use of guards on plant, completely enclosing noisy plant in booths, relocating noisy portions of the plant or the use of remote handling devices should be considered.

c. Engineering. Engineering the hazard out through modifying the plant by installing cut-out switches, screens and/or machine guards and ventilation systems.

d. Administrative. Safe work practices must be encouraged and used at all times to minimise exposure to a hazard and thereby minimising the risk. Administrative control measures include:

(1) job rotation to reduce the exposure time to hazardous work processes or conditions,

(2) education and training of employees,

(3) adequate housekeeping procedures, and

(4) supervision of employees in safe work practices.

e. Personal Protective Equipment (PPE). This control measure is a means of covering and protecting an employee's body from hazards. This form of control should only be used in the following situations:

(1) as a temporary measure until a more effective control can be established,

(2) if other controls are impracticable or not as effective or efficient as PPE,

(3) during routine maintenance or emergency clean up procedures, and

(4) to supplement other control measures.
Step 4—monitoring and review

9. Monitoring and review is a necessary component of the risk management process as:
   a. it assists in determining how effective the control measures have been (ie whether or not they have had the intended effect and that no hazards have been created by the control measure itself); and
   b. not all hazards may have been identified and they may show up after a control measure is implemented.

10. Risk assessments must also be undertaken whenever circumstances change. For example when:
   a. information is obtained about a previously unknown design or manufacturing fault, or about a previously unidentified hazard;
   b. the design is revised or modified;
   c. there is a change to a risk control measure after a review of its effectiveness;
   d. the system of work associated with the plant is changed;
   e. the plant is moved;
   f. ownership of the plant changes;
   g. there is a change to the workplace environment; and
   h. there is any other change that makes the existing risk assessment irrelevant.

Enclosures:
1. Plant hazard identification work sheet
2. Risk table
3. Plant risk assessment work sheet
PLANT HAZARD IDENTIFICATION WORK SHEET
(Please use a separate form for each item of plant)

<table>
<thead>
<tr>
<th>Unit/Establishment/Branch:</th>
<th>Plant:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program:</td>
<td>Manufacturer:</td>
</tr>
<tr>
<td>Site/Location:</td>
<td>Model and Serial Number:</td>
</tr>
<tr>
<td>Inspected by:</td>
<td>Date:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hazard and Source</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>
RISK TABLE

1. A risk table is a tool that may be used to assess the degree of risk posed by a hazardous event or situation.

<table>
<thead>
<tr>
<th>Consequence</th>
<th>Very High</th>
<th>Likely</th>
<th>Unlikely</th>
<th>Highly Unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatality</td>
<td>HIGH</td>
<td>HIGH</td>
<td>HIGH</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>Major Injuries</td>
<td>HIGH</td>
<td>HIGH</td>
<td>MEDIUM</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>Minor Injuries</td>
<td>HIGH</td>
<td>MEDIUM</td>
<td>MEDIUM</td>
<td>LOW</td>
</tr>
<tr>
<td>Negligible Injuries</td>
<td>MEDIUM</td>
<td>MEDIUM</td>
<td>LOW</td>
<td>LOW</td>
</tr>
<tr>
<td>Other asset damage</td>
<td>MEDIUM</td>
<td>LOW</td>
<td>LOW</td>
<td>LOW</td>
</tr>
</tbody>
</table>

2. Events or situations assessed as very likely with fatal consequences are the most serious (i.e. HIGH risk rating); those assessed as highly unlikely with negligible injuries are the least serious (i.e. LOW risk rating). Control strategies are to ensure that those hazards with a HIGH risk rating are dealt with first.
<table>
<thead>
<tr>
<th>HAZARD IDENTIFICATION (See appendix 1)</th>
<th>LIKELIHOOD</th>
<th>CONSEQUENCE</th>
<th>RISK RATING (See appendix 2)</th>
<th>CONTROL ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vary Likely</td>
<td>Fatality</td>
<td>High</td>
<td>1. Initiated</td>
</tr>
<tr>
<td></td>
<td>Likely</td>
<td>Major Injuries</td>
<td>Medium</td>
<td>2. Implemented</td>
</tr>
<tr>
<td></td>
<td>Unlikely</td>
<td>Minor Injuries</td>
<td>Low</td>
<td>3. Reviewed</td>
</tr>
<tr>
<td></td>
<td>Highly Unlikely</td>
<td>Negligible Injuries</td>
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<td>Other Asset Damage</td>
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</tbody>
</table>

Compiled by: 
Date:

Unit/Establishment/Branch: 
Site/Location: 
Program: 
Plant: 
Manufacturer: 
Serial Number: 

HAZARD IDENTIFICATION: 
(See appendix 1)

LIKELIHOOD:
Vary Likely
Likely
Unlikely
Highly Unlikely

CONSEQUENCE:
Fatality
Major Injuries
Minor Injuries
Negligible Injuries
Other Asset Damage

RISK RATING:
High
Medium
Low

CONTROL ACTION:
1. Initiated
2. Implemented
3. Reviewed
PLANT MONITORING/AUDIT PLAN

1. The Defence Organisation applied for, and was granted, a special licence to jointly operate plant. The licence came into effect on 1 January 1997 and is valid for a four-year period.

INTERNAL MONITORING PROCEDURES

2. It is critical that responsible Programs are aware of the importance of retaining the JSL and as a consequence the need for regular monitoring.

3. In addition, responsible Programs are to provide evidence that:
   a. maintenance and testing inspections are being carried out, in accordance with the manufacturer’s requirements and relevant Australian Standards, on the licensed plant at least once a year; or sooner if a need is identified by an assessment undertaken in accordance with this annex; and
   b. records of maintenance inspections which are carried out on licensed plant are kept and that the records include a statement to the effect that each item of plant has been maintained in a safe condition and is safe to operate.

4. The requirements of paragraph 6 can be met by forwarding copies of completed Plant Registers for each ship/establishment/unit/base (as per this annex) to Director Defence Occupational Health and Safety (DDOHS) on an annual basis.

5. DDOHS, in consultation with Programs, may monitor ships, establishments, units, and bases compliance with the Special License if considered warranted or in conjunction with special purpose visits.

6. DDOHS is to initiate the reporting process by writing to Programs requesting the provision of information as follows:
   a. For the reporting period 1 July to 30 June:
      (1) DDOHS to write to Programs end February/early March for response by end June.

AL1
RESTRICTED WHEN COMPLETED

CONTACT OFFICERS DETAILS

APPOINTMENT:_________________  SHIP/ESTABLISHMENT/UNIT/BRANCH:_________________

PROGRAM:_________________  TELEPHONE NUMBER:_________________  POSTAL ADDRESS:_________________

REPORTING PERIOD:_________________

<table>
<thead>
<tr>
<th>ITEM</th>
<th>BOILERS</th>
<th>PRESSURE VESSELS</th>
<th>TOWER CRANES</th>
<th>BUILDING MAINTENANCE UNITS</th>
<th>AMUSEMENT STRUCTURES</th>
<th>TRUCK-MOUNTED CONCRETE PLACING UNITS WITH BOOMS</th>
<th>MOBILE CRANES</th>
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RESTRICTED WHEN COMPLETED
Notes

(a) Boilers categorised as hazard level A, B, C or D according to the criteria identified in: Australian Standard (AS) 3920.1—Pressure Equipment Manufacture—Assurance of Product Quality.

(b) Pressure vessels that have a hazard level of A, B, C, or D according to the criteria identified in AS 3920.1, with the exception of gas cylinders covered by AS 2030, LP gas fuel vessels for automotive use covered by AS 3509 and social produced vessels covered by AS 2071.

(c) Tower cranes.

(d) Railing maintenance units.

(e) Amusement structures covered by AS 3533, with the exception of class 1 structures.

(f) Truck mounted concrete placing units with booms.

(g) Mobile cranes with a safe working load greater than 10 tonnes.

(h) Provide details of the system of registration.

(i) Reference to cranes and hoists excluding those that are manually powered, elevating platforms or low trucks.
PLANT REQUIRING LICENCE

IN ACCORDANCE WITH SCHEDULE 6 PART 2 OF THE PLANT REGULATIONS

AUSTRALIAN DEFENCE FORCE AND DEPARTMENT OF DEFENCE

CORRECT AS AT

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<tr>
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<th>TOTAL NUMBER</th>
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<td>PRESSURE VESSELS that have a hazard level of A, B, or C, according to the criteria identified in AS 3920.1 with the exception of gas cylinders covered by AS 2030, LP gas fuel vessels for automotive use covered by AS 3509; and aerial produced vessels covered by AS 2971.</td>
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<tr>
<td>TOWER CRANES,¹</td>
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<tr>
<td>BUILDING MAINTENANCE UNITS.</td>
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<td>AMUSEMENT STRUCTURES covered by AS 3533, with the exception of class 1 structures.</td>
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</tr>
<tr>
<td>TRUCK MOUNTED CONCRETE PLACING UNITS WITH BOOMS.</td>
<td></td>
</tr>
<tr>
<td>MOBILE CRANES with a safe working load greater than 10 tonnes.¹</td>
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<tr>
<td>MODIFIED during the period.</td>
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¹ For the purpose of licensing, cranes and hoists in the above table excludes those that are manually powered, elevating work platforms or tow trucks.
OCCUPATIONAL NOISE MANAGEMENT IN THE DEFENCE ORGANISATION

SYNOPSIS: Defence employees may be exposed to noise emanating from a variety of sources in the work environment. However, through the adoption of appropriate preventive strategies Defence will ensure that it meets its duty of care to prevent noise injury at work.

This annex has been developed in accordance with the provisions of the Occupational Health and Safety (Commonwealth Employment) (National Standards) Regulations, Part 3—Occupational Noise.

REFERENCES

1. Defence
   - DI(G) PERS 19-4/CHSMAN 1 chapter 18—Occupational Noise Management in the Defence Organisation

2. Other
   - AS 1269-1989—Acoustics—Hearing Conservation parts 1 and 2, AS 1270
   - AS 1319-1994—Safety Signs for the Occupational Environment
   - Occupational Health and Safety (Commonwealth Employment) Regulations
   - NAL Publication—Attenuation of Hearing Protectors
   - Privacy Act 1988
   - Public Service Act 1922
   - WorkSafe Australia: Occupational Noise: Standards and National Code of Practice

3. Cross Reference
   - Chapter 1, annex B—Regulations and Codes of Practice
   - Chapter 7, annex K—Personal Protective Equipment
OCCUPATIONAL NOISE MANAGEMENT IN THE DEFENCE ORGANISATION

INTRODUCTION

1. Noise injury (NI) is an important issue in Australia and has affected many employees. Employees may be exposed in their work to noise emanating from a wide variety of sources such as aircraft engines, modern weapons, vehicles, workshop machinery and portable power tools. Under the Occupational Health and Safety (Commonwealth Employment) Act 1991 (OHS Act), Program Managers have a duty of care to prevent NI.

2. Noise may be annoying and interfere with concentration; if loud enough, it may cause hearing loss in an exposed person. Frequent exposure to even moderately high-levels of noise without suitable protective measures may cause permanent hearing loss. In addition, excessive noise can cause temporary loss of hearing, interfere with speech, and disrupt concentration, sleep and relaxation.

3. Hearing Protection Areas (HPA) cannot always be identified in operational, tactical or field situations. Individual items of plant or equipment may be designated as HPA for the protection of the operator/user (e.g. artillery weapons, vehicles, small arms etc.). For the remaining situations, Program Managers are to develop risk assessment techniques to quantify the degree of risk associated with managing these noise hazards.

4. The exposure limits to occupational noise are based on the assumption that an unacceptable risk of hearing damage exists in a noise environment which exceeds 85 decibels (dB) A-Weighting (A), as averaged over an eight hour working day. The exposure limits are also based on the assumption that during the remaining 16 hours of the day, a person's ears have a chance to recover, in a quiet environment, from any temporary threshold shift (TTS). Also implied is the concept of a seven-day cycle which comprises a five-day working week and a two-day break to aid recovery. Specialist advice should be sought where employees are required to undertake extended shift cycles in a HPA.

AIM

5. The aim of this annex is to enable Program Managers to implement a Noise Management Program (NMP).

HEARING CONSERVATION OBJECTIVES

6. The goal of a NMP is to prevent NI and the associated physiological and psychological effects of noise exposure.

7. The objectives of a NMP are the prevention of hearing loss and the maintenance of occupational effectiveness by means of:

a. the promotion of quiet work practices;

b. the removal or replacement of noise sources;

c. the reduction of noise by engineering means at the source or in the source to receiver path;

d. the reduction of exposure time to noise, to protect personnel from, and to prevent, NI and to protect previously affected personnel from further hearing loss;

e. the designation and signposting of HPA;
f. education at all levels regarding the effect of noise on hearing and the procedures to be followed to prevent NI;
g. the provision of personal Hearing Protection Devices (HPD) to all employees working in HPA as well as, operational, tactical and field areas; and
h. the identification of employees with NI, by comparing reference audiograms with monitoring audiograms performed during the period of employment.

8. Guidance on impulse noise is contained in appendix 1.

RESPONSIBILITIES

9. Head Defence Personnel Executive (HDPE) HDPE is responsible for the formulation of Defence Organisation policy regarding all aspects of noise management.

10. Program Managers. Program Managers are to plan and implement a NMP, incorporating the specific policies outlined in this annex. Any expenses incurred in implementing this chapter will be the responsibility of Program Management (Di(G) ADMIN 39-1—Program Management and Budgeting—Program Structure and Di(G) ADMIN 39-2—Program Management and Budgeting—Operating Framework refer).

11. Commanders/Managers. The prevention of occupational hearing loss due to exposure to noise hazards is the responsibility of all commanders/managers in accordance with the OHS Act.

12. Employees. Employees while at work are to take all reasonable practicable steps:
   a. not to create a risk, or increase an existing risk, to their health and safety or to other persons at or near the workplace;
   b. to cooperate with all persons who have obligations under the OHS Act to the extent necessary to enable them to fulfill those obligations; and
   c. to use equipment in accordance with any instruction issued by either management or the workplace supervisor consistent with its safe and proper use.

NOISE MANAGEMENT PRINCIPLES

13. The noise exposure of a person is determined by the level and duration of noise they are exposed to per working day. This noise exposure, in conjunction with other factors, can be used to develop noise management practices.

Engineering controls

14. Program Managers are to ensure that noise is controlled by engineering design methods such as elimination, enclosure and isolation. These methods are to be applied in the planning and design, and prior to the procurement stages, of new buildings, equipment and work processes.

15. For continuous noise, the occupational exposure limit is a maximum of 85 dB(A), as averaged over an eight hour working day. For impulse noise, the occupational exposure limit is a maximum of 140 dB linear (lin) Peak Sound Pressure Level (SPL) at any time.

16. Where practicable, appropriate engineering measures are to be taken to limit the noise levels to which personnel may be exposed. Engineering controls should also be applied to existing equipment, and processes, which create noise beyond the recommended limits contained in this chapter.
25. Occupational noise assessments are to be conducted by qualified Defence personnel (such as Environmental Health Officers) or appropriately qualified civilian consultants.

**Hearing Protection Areas**

26. Where engineering controls cannot reasonably reduce occupational noise exposure to below the prescribed limits of 85 dB(A) and 140 dB(Lin), the area is to be classified as a HPA. To ensure that appropriate HPD are prescribed, four discreet noise zones have been designated for use within the Defence Organisation. The noise zones are:

a. **Amber Zone.** An Amber Zone is designated where:
   
   1. continuous noise is at or above 85 dB(A) but below 100 dB(A) for a total of 15 minutes or more in a normal working day, or
   
   2. impulse noise is at or above 140 dB(Lin) but below 150 dB(Lin) at any time.

   A choice of suitably rated earmuffs or earplugs is to be worn in an Amber Zone.

b. **Red Zone.** A Red Zone is designated where:
   
   1. continuous noise is at or above 100 dB(A) but below 115 dB(A) for a total of 30 seconds or more in a normal working day, or
   
   2. impulse noise is at or above 150 dB(Lin) but below 160 dB(Lin) at any time.

   Suitably rated earmuffs are to be worn in a Red Zone.

c. **Black Zone.** A Black Zone is designated where, at any time:
   
   1. continuous noise is at or above either 115 dB(A) or 115 dB(C) but below both 120 dB(A) and 120 dB(C), or
   
   2. impulse noise is at or above 160 dB(Lin) but below 166 dB(Lin).

   A combination of suitably rated earmuffs and earplugs is to be worn in a Black Zone.

d. **Extreme Zone.** An Extreme Zone is designated where, at any time:
   
   1. continuous noise is at or above either 120 dB(A) or 120 dB(C), or
   
   2. impulse noise is at or above 166 dB(Lin).

   A combination of suitably rated earmuffs and earplugs is to be worn in an Extreme Zone. In addition, limitations on employee exposure time, as determined by qualified Defence personnel (such as Environmental Health Officer or Senior Medical Officers) or appropriately qualified civilian consultants, are to be applied.

27. The maximum SPL produced in the work area is to be used as the reference when determining noise zones. Advice on selection of suitable HPD should be obtained from qualified Defence personnel (such as Environmental Health Officers or Senior Medical Officers) or appropriately qualified civilian consultants.

**Warning signs**

28. Program Managers are to ensure that warning signs are posted and maintained at the entrance of HPA, informing personnel and third parties entering these areas that hearing protection is required.
29. The sign is to denote the colour code of the area and the type of hearing protection device(s) required. All signs are to be in English and supplemented with signs in any other language which is used as a primary language by personnel who normally work in the area.

30. The scale and design of HPA signs are detailed in appendixes 3, 4, 5 and 6. Consideration should be given to the material from which the HPA signs are constructed. Outdoor HPA signs should be robust, weather proof, fade proof, and produced on a suitable backing material such as aluminium or plastic. Indoor signs do not normally require an aluminium backing and, where appropriate, should be manufactured from less expensive cardboard or paper material. HPA signs should be of a size appropriate to their location and must be clearly visible from a distance of 25 metres.

Defence Science and Technology Organisation responsibility

31. Where it is not possible for Defence Science and Technology Organisation (DSTO) to implement the requirements of paragraphs 28-30, DSTO must, as a minimum, apply the provisions of AS 1319-1994.

Audiometric examinations

32. Program Managers are to ensure that the hearing of employees who work in areas where the steady state noise levels are above 85 dB(A) or where impulse noise is above 140 dB(peak) is monitored by regular audiometric examinations. The results of audiograms are to be analysed to determine the effectiveness of the NMP. Types of audiograms are as follows:

a. Reference audiogram. This is either the original audiogram performed on ADF members, either at the recruiting medical examination or shortly after enlistment or appointment; or the initial audiogram performed on civilians, conducted either prior to or within 90 days of commencement of employment. The reference audiogram will be updated on direction by a medical officer/audiologist should there be a significant and permanent threshold shift in hearing detected on the monitoring audiogram. The monitoring audiogram will then become the reference audiogram.

b. Monitoring audiogram. This is the term given to all other survey audiograms performed on employees during their employment. A monitoring audiogram is usually valid for a period of 12 months.

33. Where the steady state noise levels exceed 85 dB(A) or where impulse noise exceeds 140 dB(peak), Program Managers are to ensure that, as a minimum, audiometric examinations are performed as follows:

a. On Commencement of Service. ADF members are to have an audiometric examination performed at the recruiting medical examination or shortly after enlistment or appointment. Civilian employees are to have an examination prior to or within 90 days of commencement of employment but this testing is only necessary when it is known that the employee is to work in a noise hazardous job/work area.

b. Annually. All employees working in an Amber, Red or Black HPA are to have an audiometric examination annually.

c. Six-monthly. Employees working in an Extreme Noise HPA are to have an audiometric examination at least once every six months.

d. Requests. Audiometric examinations should be provided to any employee who requests such an examination, or to any employee who (during the course of their employment) has been deemed to be exposed to occupational noise.

e. On Termination of Service. All employees are to have an audiometric examination performed during the last three months before their termination of employment.
34. Procedures for the conduct of audiometric examinations are in appendix 7.

Compensation

35. Audiometric surveillance may identify hearing loss or other impairments which may be attributed to the working environment. Program Managers are to ensure that affected employees are informed of their entitlement to compensation. The audiometric report will form part of the medical documentation in relation to compensation claims.

Education

36. Education on NI is an important strategy for hearing conservation. Program Managers are to provide, to personnel who are likely to be exposed to noise levels above 85 dB(A) or 140 dB(lin), instruction on the effects of noise, NI and prevention strategies, prior to such exposure.

37. Program Managers are to ensure that employees responsible for designing or purchasing equipment, processes and facilities are aware of and receive this chapter on NI and methods for controlling noise at the source. Such instruction is to be provided prior to, or as soon as possible after, being posted to a position with such responsibility.

Operational areas

38. Units in operational areas are to establish a NMP. Areas declared as provisional HPA should be surveyed within one month. Tarmac areas, engine rooms, workshops and research facilities are to be regarded as provisional HPA until they have been surveyed.

Documentation

39. Form PM 139—Hearing Conservation Report, or equivalent for civilian employees, is part of an individual's occupational health record and is to be managed as such in accordance with section 16 of the OHS Act, the Privacy Act 1988 and the Public Service Act 1922. Program Managers are to issue administrative details and reporting procedures for Form PM 139 and civilian audiometric reports.

Appendices:
1. Impulse Noise
2. Warning Sign—Amber Zone
3. Warning Sign—Red Zone
4. Warning Sign—Black Zone
5. Warning Sign—Extreme Noise Zone
6. Form PM 139—Hearing Conservation Report
7. Method for Audiometric Examination (for Australian Defence Force Personnel)
8. The 3 Decibel Rule
IMPULSE NOISE

1. This appendix contains guidance on impulse noise. The following arrangements are to apply to firearm training:

   a. As a component of all initial training courses, the correct use of hearing protectors shall be demonstrated to all personnel required to participate in firearm training. Such personnel shall receive proper instruction regarding the workings of hearing protectors, causes of hearing damage and the associated consequences.

   b. Before each firearm practice, the Range Supervisor shall include refresher training on the correct wearing of hearing protectors.

   c. Personnel participating in static range practices shall wear earmuffs. Personnel participating in field firing practices may wear appropriately rated ear plugs, however, sufficient earmuffs must be available for those personnel who cannot wear ear plugs due to a medical condition.

   d. All personnel employed within a radius of 25 metres of a firing mound shall wear earmuffs when firing is in progress.
WARNING SIGN—AMBER ZONE

HEARING PROTECTION AREA

MUST BE WORN

AMBER ZONE

EAR MUFFS

OR

EAR PLUGS
WARNING SIGN—BLACKZONE

HEARING PROTECTION AREA

EAR MUFFS AND EAR PLUGS

MUST BE WORN
BLACK ZONE
WARNING SIGN—EXTREME NOISE ZONE

HEARING PROTECTION AREA

EAR MUFFS AND EAR PLUGS
MUST BE WORN
EXTREME ZONE
APPLY TIME-LIMIT ON EXPOSURE
# FORM PM 139—HEARING CONSERVATION REPORT

## Medical—in—Confidence

**Department of Defence**

**HEARING CONSERVATION REPORT**

### PM 139

**Revised May 82**

#### Use only black pen and/or stamps

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### Reason for Audiogram

- Initial
- Other
- Annual
- Temporary

#### HPA Employed

- Black
- Amber
- Red

#### Type of Ear Protection Worn

- Noise Reduction
- Muff
- Other

#### Area of Employment

- Factory
- Workshop
- Other

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<td>3000</td>
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<td>Day</td>
<td>Month</td>
<td>Year</td>
<td>500</td>
<td>1000</td>
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</table>

#### 1. Today's Audiogram

#### 2. Reference Audiogram

#### 3. Threshold Shift (Frequency compared with references: + = poorer; — = better)

#### 4. Is there a significant threshold shift of 15dB or greater?

- Yes
- No

- Requires Clinical assessment (Go to section 6)
- Conclude Report (Complete section 5)

#### 5. Signature of Reporting Authority

- Printed Name
- Hand
- Date

#### 6. Clinical Assessment

- Any evidence of eustachian tube dysfunction?
- Any wax in ear canals?
- Any exposure to excessive noise in preceding 16 hours?

- Yes
- No

- Treat as appropriate then refer for repeat audiogram when condition is resolved
- Treat for removal of wax then repeat audiogram
- Repeat audiogram with minimum noise free period of 16 hours prior to procedure

#### 7. Repeat Audiogram

#### 8. Reference Audiogram

#### 9. Threshold Shift (Frequency compared with references: + = poorer; — = better)

#### 10. Is there a significant threshold shift of 15dB or greater?

- Yes
- No

- Requires Form AB 696 — Occupational Hygiene Report
- Reinforce hearing protection advice

#### 11. Medical Officer's Report

- Refer to ENT specialist
- Form AB 696 — Occupational Hygiene Report sighted
- Employment standard review required
- Referral for hearing conservation lectures
- Amend reference audiogram

#### Comments (Audiometer Operator)

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(Back No 7pec-88-715amoto)

Medical—in—Confidence
METHOD FOR AUDIOMETRIC EXAMINATION
(FOR AUSTRALIAN DEFENCE FORCE PERSONNEL)

1. Wherever possible, audiograms are to be performed in automatic mode. Where an audiometer does not have an automatic function, the audiogram is to be performed manually. Manual testing is to follow the method detailed in AS 1269-1989, and in addition, 8000 Hz is to be tested. Automatic testing is to be performed on all frequencies 500 Hz to 8000 Hz. The testing procedure is as follows:

   a. Inform the employees being tested that they are going to hear a series of sounds through the earphones and instruct them to listen carefully and signal by pressing and releasing the response button each time they hear one of these sounds, no matter how faint it is.

   b. The earphones are placed firmly over the ears, with the red phone over the right ear and blue phone over the left. The earphones should be level with the entrance to the ear canal, and the headset should be secure.

   c. Where one ear is known to be significantly better than the other, the test is commenced with the better ear. If there is no significant difference between the ears, begin with the right ear.

   d. The audiometer will perform the test automatically, and the manufacturer's instructions must be followed. All frequencies from 500 to 8000 Hz are to be tested and recorded on the member's Form PM 139—Hearing Conservation Report or equivalent civilian form.

2. The respective Programs are to ensure that personnel conducting procedures are trained in audiometric testing. Each employee attending for an audiometric assessment is to take their HPD for examination by appropriately trained health personnel during that attendance.

3. The respective Director-Generals of Health Services are to ensure that, when employees are found to have a significant threshold shift compared to their most recent reference audiogram, standard review procedures and actions are undertaken as defined by Program Managers. Recommended procedures are as follows:

   a. Ensure that no transient condition exists that could account for the hearing loss, such as a cold, earache or recent noise exposure. If such a condition exists, defer action and retest as soon as possible after remission of the symptoms.

   b. If no condition exists, repeat the audiogram within 24 hours or as soon as possible thereafter, after 16 hours in quiet conditions. Average the results from the two audiograms. If the average loss from the reference audiogram is 15 dB or less, in all frequencies 500–8000 Hz, take no further action.

   c. Should there be, at any frequency 500–8000 Hz, a threshold shift of 15 dB or greater from the reference audiogram:

      (1) advise the employee of the test results;

      (2) check the employee's noise exposure history since the last audiogram was performed;

      (3) check the suitability and condition of the employee's hearing protection equipment, the technique of fitting and frequency of use; and

      (4) take appropriate corrective action, eg reissue of PPE, relocation to a quiet work area.
d. Should any of the medical referral criteria, detailed in paragraph 4, be met:
   (1) ADF personnel are to be referred to a medical officer for review and advice, or
   (2) civilian employees are to be referred to an audiologist for review and advice.

e. Retest the employee in six months.

4. The medical/audiologist referral criteria are:
   a. a significant threshold shift of 15 dB or more at any frequency 500–8000 Hz;
   b. if the hearing loss difference between both ears is 15 dB or more at any frequency
      500–8000 Hz;
   c. discharge from an ear, occlusion of the ear canal by wax or if there is a foreign body
      in the canal; or
   d. any other reason that the tester considers appropriate for medical officer/audiologist
      review.

5. The results of the recruiting audiogram will be included on the recruiting medical form.
   Monitoring and termination audiograms are to be annotated on Form PM 139 or an equivalent
   civilian document.
1. The 3 dB rule provides a guide for the length of time personnel may be exposed to steady state noise hazards (assuming a normal recovery period below 75 dB each day). In essence, for every 3 dB(A) increase in the sound level the exposure time is halved. This means that a 3 dB(A) increase is a doubling of the sound intensity. The table below illustrates the 3 dB rule.

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<td>85</td>
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<td>97</td>
<td>30 minutes</td>
</tr>
<tr>
<td>100</td>
<td>15 minutes</td>
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ELECTRONIC AND ELECTRICAL HAZARDS

SYNOPSIS: This annex contains the safety measures applicable to electronic and electrical hazards. The electrical safety of plant and equipment is inherent in its design, manufacture, installation and maintenance and where these are properly carried out there is little risk to property or employees.

REFERENCES

1. Defence
   • MOHS-A, chapter 39, Electronic and Electrical Hazards
2. Other
3. Cross Reference
   • Chapter 4, annex A—Ionising Radiation Hazards
   • Chapter 4, annex B—Non-Ionising Radiation
SAFE TECHNIQUES FOR WELDING, BRAZING AND SOLDERING

SYNOPSIS: Welding and allied processes present a broad range of hazards: fire, electric shock, toxic fumes and radiation are the most common dangers for which precautions must be taken. Only trained operators and trainee operators under supervision are permitted to operate welding equipment. This annex provides guidance on the safety measures applicable to welding and allied processes.

REFERENCES

1. Defence
   • MOHS-A chapter 51—Welding

2. Other
   • Approved Code of Practice on Welding (incorporating AS 1338 Parts 1-3—Filters for eye protectors and AS 1674—Safety in Welding and Allied Processes Part 1—Fire Precautions and Part 2—Electrical)
   • AS 1558—Protective clothing for welders
   • AS 3853—Fume from welding and allied processes
   • AS 3957—Light-transmitting screens and curtains for welding operations
   • AS 4278—Oxygen and Acetylene Gas reticulation systems
   • Worksafe Australia Guide—Welding Fumes and Gases

3. Cross Reference
   • Chapter 1, annex 8—Regulations and Codes of Practice
   • Chapter 5, annex A—Hazardous Substances
   • Chapter 7, annex K—Personal Protective Equipment
FIRE SAFETY

SYNOPSIS: This annex directs Defence Programs to implement the administrative procedures outlined in MFPE—Manual of Fire Protection Engineering which is the primary source of policy on emergency procedures within the Defence Organisation.

REFERENCES

1. Defence
   • MOHS—A chapter 43—Fire Prevention
   • DCM No 79/92—Fire Safety
   • MFPE chapter 2—Fire and Emergency Training

2. Other
   • AS 1266—Fire Control Plans for Ships
   • AS 1603.1—Fire Detection, Automatic
   • AS 1841.1—Fire Extinguishers, Portable
   • AS 3504—Fire Blankets
   • AS 4067—Firefighters Helmets—Specification
   • AS 4067—Fire Prevention
   • AS 1851—Fire Protection Equipment, Maintenance of
   • AS 2375—Guide to Selection, Care and Use of Clothing for Protection Against Heat and Fire

3. Cross Reference
   • Chapter 7, annex J—Emergency Procedures
Administrative controls

17. Where the application of engineering controls is not reasonably practicable, Program Managers are to ensure that administrative controls are to be applied to reduce the noise exposure of personnel and third parties, so that noise exposure limits are not exceeded. Administrative controls include the scheduling of work, job rotation, observance of quiet work practices and limiting the entry of personnel and third parties to work areas.

Personal protective equipment

18. Personal hearing protection is required when engineering and administrative controls have failed, or where it is not practicable (eg some weapon systems) to reduce noise exposure to recommended levels. Guidance in selecting and fitting of Personal Protective Equipment (PPE) can be obtained from Australian Standard (AS) 1269 or the National Acoustic Laboratories (NAL) publication ‘Attenuation of Hearing Protectors’.

19. The use of PPE must be supported by a comprehensive program which includes:
   a. guidelines and instruction on equipment selection, use and maintenance;
   b. education of employees (education is to be provided prior to employees commencing work in a HPA or the introduction of new types of PPE); and
   c. regular audiometric examinations (refer to paragraph 32).

20. HPD can be passive or active. Passive HPD (eg normal earmuffs or earplugs) are to have Standards Australia approval. Active HPD are devices in the form of earmuffs which include electronic circuitry to reduce the noise at the ear of the wearer.

21. Personnel are to wear appropriate personal HPD while working in or visiting a HPA. Each employee who is issued with a HPD has a personal responsibility for ensuring that the HPD fits properly, is clean and is fully serviceable. The wearing of HPD in HPA is mandatory. Employees who wilfully fail to wear issued HPD may be liable to disciplinary or appropriate administrative action being taken against them. If employees have any medical or other impairment that would interfere with their use of a particular type of HPD, they are to advise their supervisor so that alternative HPD may be provided.

22. Commanders/managers are to ensure that visitors are provided with clean and fully serviceable HPD.

Noise assessments

23. Noise assessments involve the measurement and analysis of noise sources. Program Managers are to ensure that noise assessments are performed at regular intervals, but not less than once every five years, at all Defence establishments where noise levels are expected to exceed 85 dB(A). Also, noise assessments are to be conducted when changes are made to equipment or processes within the working area.

24. Program Managers are to ensure that noise assessments of Defence establishments and facilities are conducted where noise levels are expected to exceed 85 dB(A) for continuous noise or 140 dB(lin) for impulse noise. The objectives of noise assessments are to:
   a. identify areas where personnel and third parties are likely to be exposed to noise levels above the specified limits,
   b. obtain information on the characteristics of the noise to determine appropriate control measures,
   c. evaluate the effectiveness of noise control measures, and
   d. provide information for the selection of appropriate hearing protection measures.
THERMAL CONDITIONS

SYNOPSIS: Many factors determine whether thermal extremes will adversely affect safety and health at work. This annex provides general guidance on how environmental conditions should be managed to provide a healthy and safe workplace so that personal discomfort or thermal stress from adverse environmental conditions can be eliminated or minimised.

REFERENCES

1. Defence
   • DI(G) PERS 16-9—Prevention of Heat Related Illness and Injuries
   • OHSMAN 1 chapter 10, Thermal Conditions
   • DCM No 4/96—Working in Hot Conditions, 17 January 1995
   • DCM No 5/95—Airconditioning and Thermal Comfort in Australian Public Service Offices, 17 January 1995

2. Other
   • Air Conditioning and Thermal Comfort in Australian Public Service Offices—An information booklet for health and safety representatives, CPSU/Conicare, 1994

3. Cross Reference
   • Chapter 8, annex A—Prevention of Heat Related Illness and Injuries
Defence has a ‘duty of care’ under the Occupational Health and Safety Act 1991 (OHS Act) and Occupational Health and Safety Standards (Safety Standards) Regulations 1994 – Part 3 – Occupational Noise (Safety Standards Regulations), to ensure employees (ADF and APS), contractors and other affected persons, are not subjected to noise in excess of the mandated exposure standard. See section 10 for references.

Additionally, Defence (as an employer) must take all reasonably practicable steps to ensure that employees, contractors and other affected persons, do not suffer Noise Induced Hearing Loss (NIHL) as a result of Defence work or activities.

Employees may be exposed in their work to noise emanating from a wide variety of sources such as aircraft engines, modern weapons, vehicles, workshop machinery and portable power tools. Under the OHS Act, Groups and Services have a ‘duty of care’ to prevent NIHL.

Noise may be annoying and interfere with concentration, and if loud enough, it may cause hearing loss in an exposed person. Frequent exposure to even moderately high-levels of noise without suitable protective measures may cause permanent hearing loss. In addition, excessive noise can cause temporary loss of hearing, interfere with speech, and disrupt concentration, sleep and relaxation.

Occupational NIHL is a major health risk for employees in the workplace. The condition is irreversible and can lead to degradation of an employee’s quality of life due to communication difficulties. Exposure to excessive noise can also result in costs to Defence including:

- increased employee absenteeism and turnover;
- lowered performance and increased accidents; and
- increased health care and compensation.

Hearing Protection Areas (HPA) cannot always be identified in operational, tactical or field situations. Individual items of plant or equipment may be designated as HPA for the protection of the operator/user (eg artillery weapons, vehicles, small arms etc). For the remaining situations, Groups and Services are to develop risk assessment techniques to quantify the degree of risk associated with managing these noise hazards.

For the purposes of the Safety Standards Regulations, the exposure standard for noise in the occupational environment is an eight hour equivalent continuous A-weighted sound pressure level, $L_{Aeq,8h}$, of 85 dB(A). For peak noise, the exposure standard is a C-weighted peak sound pressure level, $L_{C,peak}$, of 140 dB(C). The exposure to noise is measured at the employee’s ear position without taking into account any hearing protection. Repeated exposure to noise between 75 and 85 dB(A) over long periods may be a small risk to some people. The risk becomes greater with progressively increasing levels. Therefore, workplace noise levels lower than the National Standard for Occupational Noise [NOHSC: 1007(2000)] are desirable, section 10, references refers.
Introduction

The occupational noise exposure limits are based on the assumption that an unacceptable risk of hearing damage exists in a noise environment which exceeds 85 decibels (dB) A-Weighting (A), as averaged over an eight-hour working day. Additionally, it is assumed that during the remaining 16 hours of the day, a person’s ears have a chance to recover, in a quiet environment, from any temporary threshold shift (TTS).

Also implied is the concept of a seven-day cycle which comprises a five-day working week and a two-day break to aid recovery. Specialist advice should be sought where employees are required to undertake extended shift cycles in an HPA.

Definitions

1.1.4

The Occupational Health and Safety Code of Practice 2008 (OHS Code 2008) - Part 3 - Noise, contains the following definitions, which apply to this policy. Section 10, references refers.

Occupational noise induced hearing loss (NIHL) - means hearing impairment arising from exposure to excessive noise at work. Occupational noise induced hearing loss is also commonly known as industrial deafness.

Exposure standard - means the maximum level for noise exposure in the workplace as set out in 3.03(1) of the Safety Standards Regulations.

Hearing protection areas (HPA) - means areas where persons may be exposed to excessive noise. During normal operations, no person should enter such an area without wearing appropriate personal hearing protectors. Hearing protection areas should be clearly defined and sign-posted according to AS 1319:1994 - Safety signs for the occupational environment.

Note: For links to Australian Standards (AS) see section 10, references. The AS referred to in the policy are those mandated in the Safety Standards Regulations or as stated in the OHS Code 2008. The Standards Australia website may have updated versions of these.

Decibel - is the unit used to indicate the relative magnitude of sound pressure level and other acoustical quantities. The range of sound pressures commonly encountered is very large so a logarithmic scale is used. The decibel is the unit used on this scale and is abbreviated to dB. On the decibel scale, the threshold of hearing occurs at a sound pressure level of about 0dB and the threshold of pain occurs in the 110dB to 130dB range. As the decibel is also used to describe the level of other quantities, such as sound power and vibration acceleration, it is always necessary to refer to the specific quantity being measured, for example, L_{Aeq,8h} or LC, peak.


dB (C) - means C-weighted sound pressure level in decibels. C-weighting - refers to a standardised frequency response used in sound measuring instruments as specified in AS IEC 61672.1:2004 - Electroacoustics - Sound level meters - Specifications.

L_{Aeq,8h} - eight-hour equivalent continuous A-weighted sound pressure level in dB(A) referenced to 20 micro Pascals means that steady noise level which would, in the course of an eight-hour period, cause the same A-weighted sound energy as that due to the actual noise over an actual working day. This is determined in accordance with AS/NZS 1220.1:2008 - Occupational noise management - Measurement and assessment of noise immission and exposure.

LC, peak - peak noise level means C-weighted peak sound pressure level in decibels (dB(C)) referenced to 20 micro Pascals determined in accordance with AS/NZS 1220.1:2008 - Occupational noise management - Measurement and assessment of noise immission and exposure.

Continued on next page
Definitions

1.1.4 (continued)

Noise emission – is defined in AS/NZS 1269.0:2005 – Occupational noise management – Overview as the sound radiated into the environment or to a defined position from a defined source such as a machine or equipment.

Noise immersion – Describes the influx of sound at a particular location from all sources such as machines, equipment, activities and the environment.

Personal hearing protectors – mean a device, or pair of devices, worn by a person or inserted in the ears of a person to protect that person's hearing.

Personal hearing protector program – means a program for personal hearing protection and, when required, regular hearing testing, which is adopted when technical or economic problems delay, or make impracticable, the reduction of exposure to excessive noise by engineering or administrative noise control measures.

Authority

1.1.5

The OHS Act, Section 23, provides the authority for the Safety Standards Regulations. Defence policy on Noise management in Defence requires compliance with the Safety Standards Regulations objectives:

- ensuring employees are not subjected to noise in excess of the mandated exposure standard, by identifying noise related hazards;
- eliminating risks (or if it is not reasonably practicable to eliminate those risks, minimise the risks) to ensure employees do not suffer NIHL; and
- implementing risk control measures to manage the risks to NIHL.

Scope

1.1.6

This policy provides information and guidance to Groups and Services in relation to effective noise management, enabling Defence to meet its 'duty of care' obligation under the OHS Act and Safety Standards Regulations, Part 3 – Occupational noise. It also assists Commanders/Executives and Managers/Supervisors to eliminate, or if not reasonably practicable, minimise the risks applicable to all work situations where noise levels are in excess of the mandated exposure standard.

Policy principles

1.1.7

The principles of this policy are to:

- implement a Noise Management Program (NMP), based on the requirements of the Safety Standards Regulations, Part 3 – Occupational noise and the relevant OHS Code 2008 and applicable Australian Standards;

- prevent NIHL and the associated physiological and psychological effects of noise exposure;

- prevent hearing loss and maintain occupational effectiveness by means of:
  - promoting quiet work practices;
  - removing and replacing noise sources;
  - reducing noise by engineering means at the source, or in the source to receiver path;
  - reducing exposure time to noise, to protect personnel and to prevent NIHL, and to protect previously affected personnel from further hearing loss;
  - designation and signposting of HPA;
  - education at all levels regarding the effect of noise on hearing and the procedures to be followed to prevent NIHL;

Continued on next page
Policy principles
1.1.7 (continued)

- providing personal Hearing Protection Devices (HPD) to all employees working in HPA as well as, operational, tactical and field areas; and
- identifying employees with NIHL, by comparing reference audiograms with monitoring audiograms performed during the period of employment.

Noise management principles and guidance on impulse noise is contained in sections 3 and 4.

Contents
1.1.8

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Section 2 – Specific responsibilities

Apart from the responsibilities in chapter 1 of this manual that apply to all OHS policies, the following requirements apply to this policy.

Assurance

1.2.1 For Defence to assure continued improvement in OHS performance and compliance with legislative requirements, it must establish and maintain an effective Noise Management Program (NMP) that complies with Part 3 of the Safety Standards Regulations, the OHS Code 2008 and this policy.

In Defence, as part of the assurance process, OHS audits are to be conducted at various levels. An OHS audit is a systematic examination against defined criteria to validate Defence OHS systems, structures, policies, instructions and guidelines. Section 10, references - Assurance of Defence occupational health and safety provides further information on the various types of audits.

Reporting

1.2.2 To assess Defence’s level of safety performance regarding effective noise management in Defence, records and audits need to be documented and reported to management or the Chain of Command.

Where (in accordance with legislation) a risk assessment needs to be undertaken regarding noise exposure levels in the workplace, information on any hazards needs to be reported to any person who is likely to be exposed to the risk and any person supervising.

OHS risk management is considered by Defence to be the most practical way of finding and fixing workplace health and safety problems. Further information on this is available at section 10, references - Risk management in Defence occupational health and safety.

Defence (as an employer), is obliged under the OHS Act, to notify Comcare of certain accidents or dangerous occurrences in the workplace and maintain a record of OHS incidents in Defence. This is achieved through the lodgement of form AC 563 - Defence OHS incident report (note: this is a supervisor responsibility). For further information on OHS incident reporting see section 10, references.

A summary of form AC 563 should be kept with local records, but should exclude personal information which may identify the person. The summary may be used for the purpose of providing and considering relevant information when implementing risk control measures.

Organisational responsibilities

The following table describes the responsibilities for Defence organisations.

<table>
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<th>Organisation</th>
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</thead>
<tbody>
<tr>
<td>Head People Capability (HPC)</td>
<td>HPC (delegated to OHS Branch) is responsible for the formulation of corporate Defence policy regarding all aspects of noise management.</td>
</tr>
</tbody>
</table>
The following table describes the responsibilities for Defence individuals.

<table>
<thead>
<tr>
<th>Individual</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Service Chiefs and Group Heads</strong></td>
<td>Service Chiefs and Group Heads are to plan and establish a NMP incorporating the requirements of this policy, to ensure compliance with legislative requirements. When conducting annual OHS audits, activities in relation to noise management should be considered, and the audit reports forwarded to Director General OHS by 30 March each year.</td>
</tr>
<tr>
<td><strong>Commanders and Executives</strong></td>
<td>Commanders and Executives are responsible for ensuring: - employees are aware of this policy and their obligations under it; - employees are not subjected to noise in excess of the mandated exposure standard; and - risk management processes are implemented to eliminate (or if it is not reasonably practicable minimise) the risks, to ensure employees do not suffer Noise Induced Hearing Loss (NIHL). When conducting annual OHS internal audits, the responsible Commanders and Executives are to ensure noise management related activities are included.</td>
</tr>
<tr>
<td><strong>Managers and Supervisors</strong></td>
<td>Managers and Supervisors are responsible for ensuring the requirements provided in the sections of this policy are implemented and maintained. Managers and Supervisors are required to conduct workplace inspections periodically to identify OHS hazards, assess the associated risks and apply appropriate risk control measures, in relation to noise management.</td>
</tr>
<tr>
<td><strong>Employees</strong></td>
<td>Employees are responsible for: - not creating a risk, or increasing an existing risk, to their health and safety or to other persons at or near the workplace; - complying with workplace instructions and requirements related to the prevention of NIHL; and - complying with workplace safety instructions in relation to noise management and using the safety equipment provided.</td>
</tr>
</tbody>
</table>

**Training and skillling**

Groups and Services are responsible for ensuring all personnel who are likely to be exposed to noise in excess of the mandated exposure standard, are provided with information on the effects of NIHL and appropriate prevention strategies.

The Defence OHS website provides information on the Defence occupational noise officer (DONO) course and the Noise awareness program (see section 10, references).

Defence’s mandatory OHS awareness training requirements and OHS skills development training can be located in section 10, references.

**Financial implications**

In accordance with The Defence occupational health and safety policy framework (see section 10, references), Groups and Services are responsible for the financial costs and expenditure in relation to the implementation of this policy.
Section 3 - Noise management principles

Noise exposure

1.3.1 The noise exposure of a person is determined by the level and duration of noise they are exposed to per working day. This noise exposure, in conjunction with other factors, can be used to develop noise management practices.

Engineering controls

1.3.2 Groups and Services are to ensure that noise is controlled by engineering design methods such as elimination, enclosure and isolation. These methods are to be applied in the planning and design, and prior to the procurement stages, of new buildings, equipment and work processes.

For continuous noise, the occupational exposure limit is a maximum of 85 dB(A), as averaged over an eight hour working day. For impulse noise, the occupational exposure limit is a maximum of 140 dB(C) Peak Sound Pressure Level (SPL) at any time.

Where practicable, appropriate engineering measures are to be taken to limit the noise levels to which personnel may be exposed. Engineering controls should also be applied to existing equipment, and processes, which create noise beyond the recommended limits contained in this policy.

Administrative controls

1.3.3 Where the application of engineering controls is not reasonably practicable, Groups and Services are to ensure that administrative controls are to be applied to reduce the noise exposure of personnel and third parties, so that noise exposure limits are not exceeded. Administrative controls include the scheduling of work, job rotation, observance of quiet work practices and limiting the entry of personnel and third parties to work areas.

Personal Protective Equipment

1.3.4 Personal hearing protection is required when engineering and administrative controls have failed, or where it is not practicable (eg some weapon systems), to reduce noise exposure to recommended levels. Guidance in selecting and fitting of Personal Protective Equipment (PPE) can be obtained from AS 1269:2005 - Occupational Noise Management or the National Acoustic Laboratories (NAL) publication Attenuation of hearing protectors.

The use of PPE must be supported by a comprehensive program which includes:

- guidelines and instruction on equipment selection, use and maintenance;
- education of employees (education is to be provided prior to employees commencing work in a Hearing Protection Area (HPA) or the introduction of new types of PPE); and
- regular audiometric examinations.

Hearing Protection Devices (HPD) can be passive or active. Passive HPD (eg normal earmuffs or earplugs) are to have Standards Australia approval. Active HPD are devices in the form of earmuffs, which include electronic circuitry to reduce the noise at the ear of the wearer.

Personnel are to wear appropriate personal HPD while working in or visiting a HPA. Each employee who is issued with a HPD has a personal responsibility for ensuring that the HPD fits properly, is clean and is fully serviceable. The wearing of HPD in HPA is mandatory. Employees who wilfully fail to wear issued HPD may be liable to disciplinary or appropriate administrative action being taken against them. If employees have any medical or other impairment that would interfere with their use of a particular type of HPD, they are to advise their supervisor so that alternative HPD may be provided.

Commanders and Executives are to ensure that visitors are provided with clean and fully serviceable HPD.
Noise assessments involve the measurement and analysis of noise sources. Groups and Services are to ensure that noise assessments are performed at regular intervals, but not less than once every five years, at all Defence establishments where noise levels are expected to exceed 85 dB(A). Also, noise assessments are to be conducted when changes are made to equipment or processes within the working area.

Groups and Services are to ensure that noise assessments of Defence establishments and facilities are conducted where noise levels are expected to exceed 85 dB(A) for continuous noise or 140 dB(C) for impulse noise. The objectives of noise assessments are to:

- identify areas where personnel and third parties are likely to be exposed to noise levels above the specified limits;
- obtain information on the characteristics of the noise to determine appropriate control measures;
- evaluate the effectiveness of noise control measures; and
- provide information for the selection of appropriate hearing protection measures.

Occupational noise assessments are to be conducted by qualified Defence personnel such as Environmental Health Officers, or Australian Defence Force Academy (ADFA) ‘Noise’ course graduates, or appropriately qualified civilian consultants.

Where engineering controls cannot reasonably reduce occupational noise exposure to below the prescribed limits of 85 dB(A) and 140 dB(C), the area is to be classified as a HPA. To ensure that appropriate HPD are prescribed, four discreet noise zones have been designated for use within the Defence. The octave band method is to be used for assessing HPD used in Red, Black and Extreme noise zones. The noise zones are:

- **Amber Zone.** An Amber Zone is designated where:
  - continuous noise is at or above 85 dB(A) but below 100 dB(A) for a total of 15 minutes or more in a normal working day; or
  - impulse noise is at or above 140 dB(C) but below 150 dB(C) at any time.

A choice of suitably rated earmuffs or earplugs is to be worn in an Amber Zone. The correct class of HPD is to be selected by referring to the table in appendix A of AS/NZS 1269.3:2005 – *Occupational noise management – Hearing protector program*, depending on the level of noise encountered.

- **Red Zone.** A Red Zone is designated where:
  - continuous noise is at or above 100 dB(A) but below 115 dB(A) for a total of 30 seconds or more in a normal working day; or
  - impulse noise is at or above 150 dB(C) but below 160 dB(C) at any time.

Suitably rated earmuffs are to be worn in a Red Zone. For guidance on how to use the octave band method to select the most appropriate HPD refer to appendix A of AS/NZS 1269.3:2005.

- **Black Zone.** A Black Zone is designated where, at any time:
  - continuous noise is at or above either 115 dB(A) or 115 dB(C) but below both 120 dB(A) and 120 dB(C); or
  - impulse noise is at or above 160 dB(C) but below 166 dB(C).

Continued on next page
1.3.7 Hearing protection areas

A combination of suitably rated earmuffs and earplugs is to be worn in a Black Zone. For guidance on how to use the octave band method to select the most appropriate HPD refer to Appendix A of AS/NZS 1269.3:2005.

- **Extreme Zone.** An Extreme Zone is designated where, at any time:
  - continuous noise is at or above either 120 dB(A) or 120 dB(C); or
  - impulse noise is at or above 166 dB(C).

A combination of suitably rated earmuffs and earplugs is to be worn in an Extreme Zone. For guidance on how to use the octave band method to select the most appropriate HPD refer to Appendix A of AS/NZS 1269.3:2005. In addition, limitations on employee exposure-time, as defined by qualified Defence personnel (see 1.3.5) or appropriately qualified civilian consultants, are to be applied.

The maximum SPL produced in the work area is to be used as the reference when determining noise zones. Advice on selection of suitable HPD should be obtained from qualified Defence personnel (see 1.3.5) or appropriately qualified civilian consultants.

Warning signs

1.3.7

Groups and Services are to ensure that warning signs are posted and maintained at the entrance of HPA, informing personnel and third parties entering these areas that hearing protection is required.

The sign is to denote the colour code of the area and the type of hearing protection device(s) required. All signs are to be in English and supplemented with signs in any other language which is used as a primary language by personnel who normally work in the area.

The design of HPA signs are detailed in section 5. Consideration should be given to the material from which the HPA signs are constructed. Outdoor HPA signs should be robust, weather proof, fade proof, and produced on a suitable backing material such as aluminium or plastic. Indoor signs do not normally require an aluminium backing and, where appropriate, should be manufactured from less expensive cardboard or paper material. HPA signs should be of a size appropriate to their location and must be clearly visible from a distance of 25 metres. For additional information on the use of Safety Signs, see section 10, references.

Audiometric examinations

1.3.8

Groups and Services are to ensure that the hearing of employees who work in areas where the steady state noise levels are above 85 dB(A) or where impulse noise is above 140 dB(C) is monitored by regular audiometric examinations. The results of audiograms are to be analysed to determine the effectiveness of the Noise Management Program (NMP). Types of audiograms are as follows:

- **Reference audiogram.** This is either the original audiogram performed on ADF members, either at the recruiting medical examination or shortly after enlistment or appointment; or the initial audiogram performed on civilians, conducted either prior to or within 90 days of commencement of employment. The reference audiogram will be updated on direction by a medical officer/audiologist should there be a significant and permanent threshold shift in hearing detected on the monitoring audiogram. The monitoring audiogram will then become the reference audiogram; and

- **Monitoring audiogram.** This is the term given to all other survey audiograms performed on employees during their employment. A monitoring audiogram is usually valid for a period of 12 months.

Where the steady state noise levels exceed 85 dB(A) or where impulse noise exceeds 140 dB(C), Groups and Services are to ensure that, as a minimum, audiometric examinations are performed as follows:

Continued on next page
Audiometric examinations
1.3.8 (continued)

- **On commencement of Service.** ADF members are to have an audiometric examination performed at the recruiting medical examination or shortly after enlistment or appointment. Civilian employees are to have an examination prior to or within 90 days of commencement of employment but this testing is only necessary when it is known that the employee is to work in a noise hazardous job/work area;

- **Annually.** All employees working in an Amber, Red or Black HPA are to have an audiometric examination annually;

- **Six-monthly.** Employees working in an Extreme Noise HPA are to have an audiometric examination at least once every six months;

- **Requests.** Audiometric examinations should be provided to any employee who requests such an examination, or to any employee who (during the course of their employment) has been deemed to be exposed to occupational noise; and

- **On termination of Service.** All employees are to have an audiometric examination performed during the last three months before their termination of employment.

Procedures for the conduct of audiometric examinations are in section 8.

Compensation
1.3.9

Audiometric surveillance may identify hearing loss or other impairments which may be attributed to the working environment. Groups and Services are to ensure that affected employees are informed of their entitlement to compensation. The audiometric report will form part of the medical documentation in relation to compensation claims.

Education
1.3.10

Education on Noise Induced Hearing Loss (NIHL) is an important strategy for hearing conservation. Groups and Services are to provide, to personnel who are likely to be exposed to noise levels above 85 dB(A) or 140 dB(C), instruction on the effects of noise, NIHL and prevention strategies, prior to such exposure.

Groups and Services are to ensure that employees responsible for designing or purchasing equipment, processes and facilities are informed of this policy and methods for controlling noise at the source. Such instruction is to be provided prior to, or as soon as possible after, being posted to a position with such responsibility.

Operational areas
1.3.11

Units in operational areas are to establish a NMP. Areas declared as provisional HPA should be surveyed within one month. Tarmac areas, engine rooms, workshops and research facilities are to be regarded as provisional HPA until they have been surveyed.

Documentation
1.3.12

Form PM 139 - Hearing conservation report (see section 7), or equivalent for civilian employees, is part of an individual's occupational health record and is to be managed as such in accordance with section 16 of the OHS Act, the Privacy Act 1988 and the Public Service Act 1999. Groups and services are to issue administrative details and reporting procedures for Form PM 139 and civilian audiometric reports.
Section 4 – Impulse noise

This section contains guidance on impulse noise. The following arrangements are to apply to firearm training:

- as a component of all initial training courses, the correct use of Hearing Protection Devices (HPD) shall be demonstrated to all personnel required to participate in firearm training. Such personnel shall receive proper instruction regarding the workings of HPD, causes of hearing damage and the associated consequences;

- before each firearm practice, the Range Supervisor shall include refresher training on the correct wearing of HPD;

- personnel participating in static range practices shall wear earmuffs. Personnel participating in field firing practices are to wear HPD appropriately rated to the levels of noise generated by the nature of the firearm training. The Range Supervisor is responsible for ensuring there are sufficient appropriately rated HPD available for all participants; and

- all personnel employed within a radius of 25 metres of a firing mound shall wear earmuffs when firing is in progress.
Section 5 - Warning signs

Diagrams of noise zone warning signs are provided below.

1.5.1
Section 6 – The use of foam earplugs

Use of foam earplugs
1.6.1

When using foam earplugs, to provide the level of noise protection specified by the manufacturer, foam earplugs must be inserted correctly. Failing to insert the earplugs deep enough, or not creating an adequate seal, may result in the earplugs providing a level of attenuation below the specified Noise Reduction Rating.

Training for correct insertion of foam earplugs
1.6.2

Where personal hearing protection (or PPE) is required to reduce noise exposure to recommended levels (where engineering and administrative controls have failed or are not practicable), the use of PPE must be supported by adequate training.

Formal training such as small-group training provided by a recognised subject matter expert or instructional DVD, are recommended. However, where this is impractical, earmuffs should be used.

Note: Groups and Services are responsible for arranging and funding training.

Recommendations
1.6.3

To mitigate the potential increased risks to health and safety, managers and supervisors are to ensure that all personnel who use foam earplugs:

- are provided with the manufacturers written instructions;
- are provided with formal training to ensure correct fitting; and
- use double hearing protection (earplugs with over-the-head earmuffs), if possible or where required, to reduce noise exposure to recommended levels.
The following instructions for correctly inserting foam earplugs are provided by the Institute of Aviation Medicine.

INSTRUCTIONS FOR INSERTING FOAM EARPLUGS

1. Roll

Roll the ear plugs into a narrow, crease-free cylinder.

2. Pull Back

Rolling the foam into a thin cylinder reduces its size, allowing it to fit into the ear canal and expand evenly. It also stiffens the foam, allowing the ear plug to be inserted easily into the ear canal. The ear plug should be crease free, because creases can allow noise energy to bypass the ear plugs and leak into the ear canal.

3. Insert

Pull the ear back.

The ear canal is not straight; it must be straightened to easily insert an ear plug deeply into the ear canal. The ear canal can be straightened by reaching around the back of the head with the free hand, holding the ear and gently pulling it up and back. Failure to straighten the ear canal may result in the ear plug not being inserted deeply enough into the ear canal.

4. Hold

Insert the ear plug into the ear canal.

Ear plugs must be deeply inserted into the ear canal to provide effective protection from noise. Noise energy is attenuated only by the proportion of the foam ear plug that lies within the ear canal; therefore, it is important for a wearer to insert as much of the foam ear plug into the ear canal as practical.

3. Insert

Hold the ear plug until it expands.

This allows the ear plug to expand and lock into place deep within the ear canal. This could take as long as 40 seconds. If the ear plug is not held in place as it expands, the expansion can cause the ear plug to be extruded from the ear canal—reducing the amount of energy it can attenuate (because less foam is in the ear canal), or allowing the ear plugs to become displaced.

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Continued on next page
After inserting ear plugs, the user must check that they have been inserted correctly.

5. VISUAL CHECK
The earplug should sit deep inside the ear canal. It should not stick out beyond the tragus, and should not be visible from the front.

Visual check.
The end of the earplugs should not be visible to someone looking at you from the front (or looking at yourself front-on in a mirror). An earplug that can be seen from the front is a warning sign of poor insertion.

6. ACOUSTIC CHECK
Earplugs should block enough noise so that covering your ears with hands should not result in a significant noise difference.

Acoustic check.
An earplug is only useful when it achieves an acoustic seal in the ear canal. To check the acoustic seal, wearers should cup their hands firmly over their ears - the earplugs should be blocking enough noise that covering their ears with their hands results in no significant change in noise level.

For more information, please contact:
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Ph: (08) 87283 3109

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Section 7 – Form PM 139 – Hearing conservation report

Form PM 139 – Hearing conservation report, is also available on the Defence Web Forms System.
Form PM 139
1.7.1 (continued)

Hearing Conservation Report
Instructions for completion

General notes
- This form is to be completed in duplicate.
- This form must be completed carefully for effective implementation of the Hearing Conservation Program.
- Audiograms which do not have a significant threshold shift only require completion of the form to Section 5. A medical officer's signature is required before the form can be filed.

Reference audiogram
- The purpose of routine audiometric screening is to check whether there has been any significant change in the member's hearing compared with a reference audiogram. The reference audiogram will be the entry audiogram.
- If a significant hearing loss, ie 15 dB or greater, is determined at routine audiometry, the member is to be referred for assessment as determined by the medical officer. If a permanent change in the member's hearing is confirmed, a new reference audiogram will be allocated in accordance with Safetyman Volume 1, Part 3, Chapter 2. This then becomes the reference audiogram for future care of this patient.
- The dB values for the reference audiogram are to be recorded at Section 2 and, if required, again at Section 8.
- If the reference audiogram is not available, the details are to be obtained from the unit or establishment holding the member's health records.
Section 8 – Method for audiometric examination (for Australian Defence Force members)

Audiograms

1.8.1

Wherever possible, audiograms are to be performed in automatic mode. Where an audiometer does not have an automatic function, the audiogram is to be performed manually. Manual testing is to follow the method detailed in Australian Standards AS/NZS 1269.4.2005 – Occupational noise management – Auditory assessment, and in addition, 8000 Hz is to be tested. Automatic testing is to be performed on all frequencies 500 Hz to 8000 Hz. The testing procedure is as follows:

- inform the employees being tested that they are going to hear a series of sounds through the earphones and instruct them to listen carefully and signal by pressing and releasing the response button each time they hear one of these sounds, no matter how faint it is;
- the earphones are placed firmly over the ears, with the red phone over the right ear and blue phone over the left. The earphones should be level with the entrance to the ear canal, and the headset should be secure;
- where one ear is known to be significantly better than the other, the test is commenced with the better ear. If there is no significant difference between the ears, begin with the right ear; and
- the audiometer will perform the test automatically, and the manufacturer’s instructions must be followed. All frequencies from 500 to 8000 Hz are to be tested and recorded on the member’s Form PM 139—Hearing conservation report or equivalent civilian form.

The respective Groups and Services are to ensure that personnel conducting procedures are trained in audiometric testing. Each employee attending for an audiometric assessment is to take their HPD for examination by appropriately trained health personnel during that attendance.

The respective Directors General of Health Services are to ensure that, when employees are found to have a significant threshold shift compared to their most recent reference audiogram, standard review procedures and actions are undertaken as defined by Group and Service managers. Recommended procedures are as follows:

- ensure that no transient condition exists that could account for the hearing loss, such as a cold, earache or recent noise exposure. If such a condition exists, defer action and retest as soon as possible after remission of the symptoms;
- if no condition exists, repeat the audiogram within 24 hours or as soon as possible thereafter, after 16 hours in quiet conditions. Average the results from the two audiograms. If the average loss from the reference audiogram is 15 dB or less, in all frequencies 500–8000 Hz, take no further action;
- should there be, at any frequency 500–8000 Hz, a threshold shift of 15 dB or greater from the reference audiogram:
  - advise the employee of the test results;
  - check the employee’s noise exposure history since the last audiogram was performed;
  - check the suitability and condition of the employee’s hearing protection equipment, the technique of fitting and frequency of use; and
  - take appropriate corrective action, eg reissue of PPE, relocation to a quiet work area;

Continued on next page
Audiograms

1.6.1 (continued)

- should any of the medical referral criteria be met:
  - ADF personnel are to be referred to a medical officer for review and advice;
  - civilian employees are to be referred to an audiologist for review and advice;
- retest the employee in six months.

The medical/audiologist referral criteria are:

- a significant threshold shift of 15 dB or more at any frequency 500–8000 Hz;
- if the hearing loss difference between both ears is 15 dB or more at any frequency 500–8000 Hz;
- discharge from an ear, occlusion of the ear canal by wax or if there is a foreign body in the canal; or
- any other reason that the tester considers appropriate for medical officer/audiologist review.

The results of the recruiting audiogram will be included on the recruiting medical form. Monitoring and termination audiograms are to be annotated on Form PM 139 or an equivalent civilian document.
Section 9 – The three decibel rule

Three decibel rule

The 3 dB rule provides a guide for the length of time personnel may be exposed to steady state noise hazards (assuming a normal recovery period below 75 dB each day). In essence, for every 3 dB(A) increase in the sound level the exposure time is halved. This means that a 3 dB(A) increase is a doubling of the sound intensity. The table below illustrates the 3 dB rule.

<table>
<thead>
<tr>
<th>SPL dB(A)</th>
<th>Length of Exposure</th>
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<tbody>
<tr>
<td>85</td>
<td>8 hours</td>
</tr>
<tr>
<td>88</td>
<td>4 hours</td>
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<tr>
<td>91</td>
<td>2 hours</td>
</tr>
<tr>
<td>94</td>
<td>1 hour</td>
</tr>
<tr>
<td>97</td>
<td>30 minutes</td>
</tr>
<tr>
<td>100</td>
<td>15 minutes</td>
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### Section 10 – Reference material

#### References

<table>
<thead>
<tr>
<th>References</th>
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<tbody>
<tr>
<td>2.</td>
<td>Occupational Health and Safety (Safety Standards) Regulations 1994</td>
</tr>
<tr>
<td>5.</td>
<td>AS 1319:1994 - Safety signs for the occupational environment</td>
</tr>
<tr>
<td>6.</td>
<td>AS IEC 61672.1:2004 - Electroacoustics - Sound level meters - Specifications</td>
</tr>
<tr>
<td>7.</td>
<td>AS/NZS 1266.0:2005 - Occupational noise management - Overview and general requirements</td>
</tr>
<tr>
<td>12.</td>
<td>Safety signs</td>
</tr>
<tr>
<td>13.</td>
<td>SAFETYMAN, volume 1, part 1, chapter 10 - Assurance of Defence occupational health and safety</td>
</tr>
<tr>
<td>14.</td>
<td>SAFETYMAN, volume 1, part 1, chapter 7 - Risk management in Defence occupational health and safety</td>
</tr>
<tr>
<td>15.</td>
<td>AC 563 - OHS incident reporting</td>
</tr>
<tr>
<td>16.</td>
<td>Defence occupational noise officer (DONO) course</td>
</tr>
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<td>17.</td>
<td>Noise awareness program</td>
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<td>18.</td>
<td>OHS awareness training (Defence online Campus)</td>
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<tr>
<td>19.</td>
<td>OHS skills development training</td>
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<tr>
<td>20.</td>
<td>SAFETYMAN, volume 1, part 1, chapter 1 - Defence occupational health and safety policy framework</td>
</tr>
<tr>
<td>21.</td>
<td>Form PM 139 – Hearing conservation report (Defence Web Forms System)</td>
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#### Related material

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<tr>
<td></td>
<td>AS 1259.1:1990 – Acoustics – Sound Level meters – Non-integrating</td>
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Related material

1.10.2 (continued)

AS 1259.2.1990 – Acoustics – Sound level meters – Integrating-averaging

AS/NZS 1270:2002 – Acoustics – Hearing protectors

AS/NZS 2399 - Acoustics – Specifications for personal sound exposure meters

AS/NZS 4476 - Acoustics - Octave band and fractional octave band filters

National Acoustic Laboratories - Attenuation and use of hearing protectors (publication)

Comcare - Frequently asked questions on Noise