



# Procedure: Noise management

## Purpose

The purpose of this procedure is to inform staff of noise and vibration management requirements within the Australian National University (ANU) to ensure compliance with the *Work Health and Safety Act 2011* (Cth), the *Work Health and Safety Regulations 2011* (Cth), and the University's Work Health & Safety (WHS) Management System.

## Definitions

**Control** is anything that is implemented to eliminate or reduce the risk associated with a hazard.

**Exposure** occurs when a person interacts with a hazard.

**Hazard** is a source or a situation with a potential for harm in terms of injury or ill-health, damage to property, damage to the environment, or a combination of these (e.g. noise above a certain level may have an impact on hearing).

**Health** is freedom from illness or disease.

**Health hazard** is anything that can cause illness or disease. Exposure may occur over a short or long period of time.

**Local area** refers to a College, Research School or Service Division of the University.

**Noise** is all sound in the workplace, whether wanted or unwanted.

**Ototoxic** is damage to the hearing caused by a toxin – possibly a workplace chemical or a prescribed medication.

**PPE** means personal protective equipment.

**Risk** is the likelihood and consequence of injury or harm occurring.

**Safe Work Method Statements (SWMS)** are a set of instructions designed to communicate definite or standardized procedures to workers. These are used to obtain consistency in results and increase safety and efficiency in the workplace. SWMS known as Safe Operating Procedures, or work method statements.

**Temporary Threshold Shift (TSS)** is an auditory fatigue after exposure to loud

noises. Noise levels in excess of 70 dB (for frequencies between 1 – 4 kHz) can cause a temporary threshold shift.

**Vibration** refers to mechanical motion/oscillations of solid objects and structures. Vibration can be undesirable, wasting energy and creating unwanted sound or noise. Because sound is generated by vibrating structures, trying to reduce noise is often a problem when trying to reduce vibration.

**WEG** is the Work Environment Group.

**WHS** means work health and safety.

**Worker** is defined as anyone who carries out work for the University. Workers include staff, volunteers, contractors, students and visitors at the University.

## Procedure

### Introduction

1. The University promotes a WHS risk management approach to minimise the risks to staff, students, contractors and visitors from noise sources associated with all tasks undertaken within the University.

2. This procedure also covers managing vibration associated with noise.

3. This procedure does not cover ultrasonic or infrasound. These frequencies need special assessment and consideration. Please contact [Work Environment Group](#) (WEG) for further information.

4. Noise associated with community events is managed through the [Functions on Campus procedure](#).

### Noise

5. Noise can be positive, for example, alert and warning signals and workplace conversations. It can also be harmful, with effects ranging from personal discomfort and irritation to acoustic trauma, with risks of longer term damage.

6. Noise-induced hearing loss can result from a single exposure to a loud noise or from prolonged exposure to excessive noise in the workplace. Such loss is additional to that experienced through normal ageing. Noise-induced hearing loss is irreversible. It can cause difficulties in communicating, and tinnitus (ringing in the ears), leading to other conditions such as depression.

7. Noise may also have non-auditory effects such as:

- increased stress levels;
- increased risk of accidents;

- when combined with certain chemicals, may lead to, or increase, ototoxic effects (see Table 1);
- interference with sleep and relaxation;
- prolonged constriction of blood vessels; and
- reduced work performance.

**Table 1: Ototoxic agents**

The table contains some common examples of agents known to increase the effects of noise on hearing.

Enhance the effects of noise	Increase temporary threshold shift	
Carbon disulphide	Trichloroethylene Toluene	Ethanol Ethyl benzene
Carbon monoxide *	n-Butanol * Lead *	n-heptane n-hexane
Carbon tetrachloride	Mercury	Perchloroethylene
Styrene *	Manganese *	Solvent mixtures and fuels, Stoddard solvent
Xylene *	Arsenic	
Methyl ethyl ketone (MEK)	Organic tin	Acrylonitrile Hydrogen Cyanide
Methyl isobutyl ketone (MIBK)		Organophosphates Paraquat
* May also result in hearing loss		

## Vibration

2. Exposure to vibration in the workplace may occur through contact with various pieces of equipment such as tools, machinery and vehicles. Vibration may exist as:

- whole body vibration, which transmits through the entire body, for example when driving a heavy vehicle. This can have negative health effects such as increased heart rate and digestive problems, through to pain and damage to the spine. These effects may be dependent on the vibration's frequency.
- hand–arm vibration, which occurs through the hand and arm, for example when using hand operated tools. This can cause problems with blood circulation in the hand and forearm, and potentially damage nerves and tendons. 'White finger syndrome' is one condition caused by excessive vibration to the hands.

3. Many of the factors relating to noise management apply to vibration management. For further information contact WEG via <https://services.anu.edu.au/human-resources/health-safety>.

## Legislative requirements

4. Under the *Work Health and Safety Act 2011* (Cth) and the *Work Health and Safety Regulations 2011* (Cth), to conserve hearing the University must manage all noise above 85 dB(A) over an 8–hour day, and 140 dB(C) peak exposure level. For further information on vibration exposure standards contact WEG at <https://services.anu.edu.au/human-resources/health-safety>.

5. As well as the statutory requirement to limit noise to 85 dB(A), the University recognises that there is a risk to employees exposed beyond 80 dB(A) over an 8–hour day. Where reasonably practicable, the noise level in University workplaces should be below this level.

6. Excessive ambient noise levels in offices and computer rooms can have harmful effects on work performance. University office and computer–based work environments should ideally be:

- less than 50 dB(A) where work is being carried out that requires continual high concentration; and
- less than 70 dB(A) where more routine work is carried out that requires speed, attentiveness, or sustained conversations.

## Responsibilities

7. Each Dean or Director, or their nominated representative, is responsible for:
- ensuring suitable facilities and resources are available to create a safe and healthy workplace;
  - encouraging workplace inspections that identify noise, vibration and other hazards;
  - developing processes that help reduce significant noise and vibration;
  - ensuring that workplace noise and vibration issues are highlighted at induction and that proper training of skills to manage noise and vibration is conducted;
  - supporting the University health monitoring program for those staff working in noisy areas;
  - ensuring [plant and equipment](#) is purchased that do not exceed the general 80dBA limit or 55dBA for office and computing equipment; and
  - ensuring [plant and equipment](#) is purchased that exposes the user to lower vibration levels.
8. The responsible person for the local area or nominated representative is responsible for:
- reporting any incidents, exposures, or hazards via [online incident reporting](#);
  - reporting any WHS concerns or matters within their jurisdiction to local WHS Officers;
  - helping to identify noisy areas or hearing protection zones;
  - signage for designated hearing protection zones;
  - supporting the University health monitoring program for those staff working in noisy areas;
  - ensuring that noise and vibration issues are considered in the design of new areas or the refurbishment of older areas;
  - giving buying preference to goods that do not exceed the general 80dBA noise limit or 55dBA for office and computing equipment; and
  - giving buying preference to equipment that exposes the user to lower vibration levels.
9. Supervisors are responsible for:
- reporting any incidents, exposures, or hazards via [online incident](#)

reporting;

- reporting any WHS concerns or matters within their jurisdiction to local WHS Officers;
- ensuring job descriptions accurately reflect potential noise and vibration exposure;
- telling people about significant workplace noise and vibration issues and the measures in place to reduce exposure;
- ensuring noise and vibration is included in local area induction, if applicable;
- regularly encouraging workers to reduce exposure to noise and vibration;
- helping to identify noisy areas or hearing protection zones, including actively looking for the signs of noise and vibration problems (See: Identification of Noisy Areas below);
- doing a risk assessment for noisy areas (consult WEG <https://services.anu.edu.au/human-resources/health-safety> if you need help or noise monitoring) and managing the associated risks; and
- providing hearing protectors (if required) and the supplies for maintaining them See: [Personal Protective Equipment \(PPE\) Procedure](#);
- encouraging the correct use of hearing protectors, where needed;
- ensuring that all workers working in noisy areas (hearing protection zones) are offered, and encouraged to undertake, baseline audiometric testing;

**Note** For new staff working in noisy areas, the baseline testing should occur as soon as possible after starting employment.

- encouraging staff working in designated hearing protection areas (that is, noise exposure above 80 dB(A) for an 8-hour day) to undertake regular audiometric screening in accordance with the University's [Health Monitoring Procedure](#);
- ensuring equipment is properly maintained to reduce noise and vibration;
- ensuring controls to reduce vibration exposure are in place and enforced, for example operating equipment at a speed recommended by manufacturer.

10. Workers of the University are responsible for:

- immediately reporting all incidents, injuries, hazards, near misses to

immediate supervisors;

- contributing to and complying with safe operating procedures and guidelines to ensure not only their safety, but also that of fellow staff, students, contractors and visitors;
- adopting safe work practices that minimise noise and vibration and their effects;
- using suitable facilities and resources to ensure a safe and healthy work environment;
- notifying supervision as soon as practicable when they become aware of any defect in noise or vibration control equipment;
- correctly wearing appropriate hearing protection in designated areas where or when the noise level is or exceeds 80 dB(A) See: [Personal Protective Equipment \(PPE\) Procedure](#);
- inspecting hearing protection regularly and reporting any damage or deterioration;
- maintaining their reusable hearing protection by cleaning and storing it correctly;
- actively taking part in any training;
- contributing to ongoing monitoring and evaluation of noise control measures; and
- where relevant, participating in the University's [health monitoring program](#).

## Managing noise at ANU

### *Purchasing*

11. Before buying any new equipment, consider the effects of noise and vibration on the equipment operators and the workplace. Refer to University [Plant \(equipment\) hazard management procedure](#) for further information.
12. Where possible, buy goods that have low noise emission. In cases where noise from the equipment is likely to exceed the University's general 80 dB(A) limit, or 55dB(A) for office and computing equipment, the manufacturer or supplier must provide acoustic treatment that reduces the noise to acceptable levels.
13. Consider how to reduce noise when planning areas that may contain noisy plant and equipment.

14. Consider buying new, quieter, smoother equipment to replace out-dated, noisy or vibrating equipment.

### *Design*

15. Noise reduction should be considered in the planning stages of areas that may contain noisy plant and equipment. Consult WEG via <https://services.anu.edu.au/human-resources/health-safety> or acoustic engineers for advice during the planning stage on engineering and structural solutions or equipment purchase.

16. When designing or building plant or equipment, consider how to minimise noise and vibration. Also consider how new equipment will add to the overall level of noise and vibration.

17. Information must be provided to users about plant and equipment noise emissions. WEG can assess noise levels of new equipment.

### *Identification of noisy areas*

18. Local area WHS inspections and audits may identify potential high noisy areas.

19. Some signs of a potentially noisy area may include:

- noting whether personnel a metre away from each other can communicate clearly without raising their voices; or
- staff concerns or complaints about noisy equipment reducing concentration and performance.

20. WEG can undertake area noise monitoring or personal dosimetry to aid in noise assessment and creating a noise management plan.

21. Re-assess noise levels or the risk assessment in an area if there is:

- a change of plant/equipment;
- a change in workload or equipment operating conditions;
- a change in building structure;
- a changed work arrangement causing employees to spend more time in noisy areas; or
- a request by a WHS committee member or worker.

22. Any area assessed as having excessive noise levels shall be clearly defined and signposted as a Hearing Protection Zone at all entrances. Hearing protection zones shall be marked wherever there is the potential for noise levels to exceed 80



dB(A) over an 8-hour day.

23. Signage should be clear, unambiguous and placed where they can be seen clearly.



**Figure 1** – Signage for designated Hearing Protection Zones

24. Noisy equipment (such as chainsaws, workshop equipment or powered hand tools) should have labels which remind workers of the need for hearing protection. The requirement for hearing protection must be included in the local area training and induction for these items.

### **Managing WHS risk**

25. Noise and vibration hazards should be managed in the same way as other hazards, by completing a risk assessment and implementing appropriate controls.

26. Workers must be made aware of the risks during induction, training and regular meetings (for example toolbox talks).

27. Hazard register must be re-assessed after any significant changes that may affect noise levels, or at least annually as a minimum.

28. Safe Work Method Statements or Safe Operating Procedures must include as a minimum an assessment of noise and vibration exposure risks and appropriate controls, including PPE requirements.

29. Where equipment exceeds noise limits, the best approach is to remove noise at the source by following the Hierarchy of Control. The following options should be considered:

- eliminating the source of the noise: buying new, quieter equipment to replace old noisy equipment;
- substituting or modifying the hazard: replacing it with another process or quieter equipment;
- isolating noisy equipment by physically removing it from the general work area;

- engineering methods and structural solutions: for example, enclosing the noisy equipment or the operator; applying absorbent gaskets, mufflers and cladding to reduce vibration and noise levels; regularly maintaining equipment; modifying processes if possible; reducing impact noise during handling processes; and using sound absorbing materials in the room, or in partitions, to separate the noisy area; and
- administrative controls such as limiting work time on noisy equipment, rotating employees, putting signage in high noise areas, using noisy equipment when fewer employees are present and providing quiet areas for rest breaks.

30. PPE should be used while other measures are being implemented.
31. Workers may still need hearing protectors to reduce residual noise level and increase comfort level.
32. Effective noise control improves efficiency, work quality, safety and wellbeing of workers.
33. Extra measures can be applied to reduce specific workplace noise and vibration in the workplace. Contact WEG at [whs@anu.edu.au](mailto:whs@anu.edu.au) for advice.

## Health monitoring

34. The University offers health monitoring to all staff exposed to significant noise requiring hearing protection. Monitoring includes a baseline assessment as soon as an employee commences work, or before commencing work if possible. This initial assessment is followed by another test within the first 12 months to check for a threshold shift. Assessments then continue, usually every 12 months or as required following medical advice.

**See:** [Health surveillance procedure](#)

35. The University recognises that PPE (hearing protectors) may be required as part of noise management, particularly:
- as an interim measure until alternate noise reduction measures are effective; or
  - where the equipment or task still exceeds the allowed noise level even after applying reasonable noise control measures; or
  - where the combined hazards of noise and ototoxic agents increases the risk of hearing damage (see Table 1). This risk may be reduced in part by wearing hearing protection.
36. The maintenance of hearing protectors includes the following requirements:

- Hearing protectors, like all personal protective equipment, must be cared for and maintained according to manufacturers' instructions.
- Cleaning is recommended prior to each use. A wipe with warm soapy water is all that is required once a day. Commercial wipes are also available.
- The protector should be stored in a clean, dry environment.
- The protector should be inspected for defects and damage.
- Any worn or damaged parts should be reported to a supervisor so the protectors can be repaired or replaced.

37. Hearing protection should be specifically prescribed according to noise levels and working conditions. Advice should be sought from WEG before purchase. WEG may conduct a noise assessment of the area before working with employees to decide on the most suitable hearing protection for the situation.

38. Where helmets or face shields are worn, hearing protection, if required, should be incorporated into the head gear.

39. Visitors to hearing protection zones should be provided with hearing protection to use while in the zone.

40. Employees must be given instructions on use, fit, care, maintenance and storage of their personal hearing protectors (see paragraph 42).

**Warning** Ear-buds and headphones are not hearing protection – listening to loud music through these devices can actually increase hearing loss. To ensure people remain in contact with their work environment, ear-buds and headphones may only be worn in one ear, enabling them to hear and understand conversations and warnings.

41. Ear-buds and headphones are not allowed to be worn under hearing muffs in hearing protection zones.

42. The use of (or consideration of the use of) PPE (for example gloves) for the control of vibration must be discussed with the WEG.

## Training

43. The University provides noise and vibration training to workers in at-risk areas, including managers and supervisors, health and safety representatives and staff responsible for buying plant and equipment. Training is included in the [Workshop and trade safety course](#) but can be arranged as necessary and shall be included in local area training matrix.

44. Noise management training and awareness covers:
- awareness of the effects of noise on the ear and hearing;
  - University requirements for noise management;
  - workplace noise assessment and monitoring;
  - reducing noise;
  - all aspects of personal protective equipment; and
  - the role of health monitoring (i.e. audiometry).
45. Vibration management training and awareness covers:
- awareness of the effects of vibration on the body; and
  - control measures for vibration.

## Sources

<p><b>Legal and other requirements</b></p> <p>Links are accessible at the WEG <a href="#">Health &amp; safety   Services</a> web page</p>
<p><i>Work Health And Safety Act 2011 (Cth)</i></p>
<p><i>Work Health And Safety Regulations 2011 (Cth)</i></p>
<p><i>AS/NZS 1269.0:2005- Occupational noise management – Overview and general requirements_</i></p>
<p><i>Safe Work Australia- Managing noise and preventing hearing loss – Code of Practice</i></p>

## Document information

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