Hazardous Noise Risk Management Guideline

Section 1 - Purpose and Scope

(1) The University of Queensland (UQ) is committed to managing hazardous noise in the workplace and its adverse effect on hearing. The purpose of this Guideline is to provide information on:

a. management and control of hazardous noise;
b. preventing the occurrence of noise induced hearing loss; and
c. the process for audiometric testing of new appointees, ongoing audiometric testing, and management of test results.

(2) This Guideline applies to all UQ workers – including staff, students, visitors, volunteers and contractors that work in areas exposed to hazardous noise. Persons engaging contractors should be aware of their risk management protocols around noise management and they should provide their own hearing protection if required, or if requested by UQ people, for the work they are undertaking.

(3) Further information about the identification, control and ongoing management of noise hazards is provided in the Managing Noise and Preventing Hearing Loss at Work Code of Practice 2021 (the Code) and Hazardous Noise Risk Management Procedure.

Section 2 - Hazardous Noise Exposure

(4) The Code defines hazardous noise in relation to hearing loss as noise that exceeds the exposure standard, for noise in the workplace, namely noise that is equal to or greater than an LAeq,8h of 85 dB(A) or an LC,peak of 140 dB(C). The Code also notes that the exposure standard protects most but not all people.

(5) The most significant health concern associated with hazardous noise exposure is noise-induced hearing loss (NIHL) or 'industrial deafness'. Managing the risks associated with noise will assist in protecting staff from hearing loss.

(6) Hazardous noise (including from construction and refurbishment work) may affect occupants in nearby buildings. This noise can exist across all UQ campuses and sites (including those occupied by Controlled Entities) and should be considered as part of a risk assessment. While it may not be possible to eliminate all noise hazards from workplaces, the implementation of control measures, such as engineering or substitution, should always be the preferred control option before relying on less effective control measures such as hearing protection (which requires continual staff compliance to be effective).

(7) This Guideline contains a 'hierarchy of noise controls' that should be considered when managing noise in the workplace.

(8) If potential sources of hazardous noise have been identified and the exposures cannot be reduced to below the standard immediately, a noise assessment should be carried out. A noise assessment can help:

a. identify which workers are at risk of hearing loss;
b. determine what noise sources and processes are causing that risk;

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c. identify if and what kind of noise control measures could be implemented; and
d. check the effectiveness of existing control measures.

(9) A noise assessment may involve taking noise level measurements to determine a worker's exposure to noise. Noise measurements should be completed by a competent person and in accordance with procedures in AS/NZS 1269.1:2005 Occupational Noise Management Part 1 - Measurement and Assessment of Noise Immission and Exposure (access via Standards Databases through UQ Library). To request noise level measurements, contact your local health, safety and wellness staff.

Nuisance Noise

(10) The risk to health and wellbeing from nuisance noise exposure is more subject to individual variation than other workplace hazards, but it is important that the absence of complaint from other workers does not diminish the significance of an affected worker's concerns. Noise at levels that do not damage hearing can have other adverse effects. Persistent noise that interferes with communication or concentration can result in an increased risk of fatigue and cardiovascular problems.

(11) It is recommended to reduce noise levels below:

a. 50dB(A) where work is being carried out that requires high concentration or effortless conversation.
b. 70dB(A) where more routine work is performed that requires speed or attentiveness or where it is important to carry on conversations.

Section 3 - Other Hearing Hazards

Ototoxic Substances

(12) Exposure to some chemicals can cause hearing loss, these chemicals are called ototoxic substances. Hearing loss is more likely to occur when a worker is exposed to ototoxic substances combined with exposure to noise. A list of commonly used ototoxic substances is available in Appendix B of the Managing Noise and Preventing Hearing Loss at Work Code of Practice 2021. Workers who are exposed to these substances may be required to attend regular audiometric testing. Specific audiometric testing requirements are outlined in this Guideline.

(13) Control measures such as substitution, isolation and local ventilation should be implemented to eliminate or minimise exposure to ototoxic chemicals. Personal protective equipment (PPE) should be employed to prevent skin or respiratory absorption when other controls do not provide sufficient protection.

Vibration

(14) Workers who use equipment that generates hand-arm vibration and noise are more likely to develop hearing loss. Tools that expose workers to both noise and hand-arm vibration include the following:

a. pneumatic and electrical rotary tools such as concrete breakers, sanders, grinders and drills;
b. percussive tools such as chippers and riveters; and
c. petrol-powered tools such as lawn mowers, brush cutters and chainsaws.

(15) Control measures to reduce hand-arm vibration includes exploring alternative methods of work to exclude the need to use vibrating equipment or purchasing tools that produce less vibration.

(16) Further information on vibration can be found in Controlling Risks From Exposure to Vibration Guideline.

Temporary Hazardous Noise

(17) Where the Head of Organisational Unit determines that temporary hazardous noise exists (e.g., construction or maintenance work) and the noise interferes with work performance:

a. all practicable measures to control the noise should be implemented; and
b. where the noise cannot be practicably controlled, occupants may be advised and assisted to relocate to other work areas.

Section 4 - Noise Control

(18) Effective control of risk from workplace noise can often involve more than one single control measure and may require a combination of two or more different controls.

Hierarchy of Noise Controls

(19) The most effective control measure is to eliminate the source of noise completely.

(20) For example:

a. cease use of a noisy machine/instrument/equipment;
b. change the way work is carried out so hazardous noise is not produced; or
c. do not introduce the noise hazard into the workplace.

(21) If noise cannot be eliminated, then controls should focus first on controlling the noise at the source (e.g. fitting noise mufflers), along the noise pathway (e.g. enclosure) and finally at the receiver (e.g. use of hearing protection devices).

(22) New workplaces and installation sites for new plant in existing workplaces should be designed and constructed in support of controlling the noise at the source and/or along the pathway to ensure that exposure to noise is as low as reasonably practicable.

(23) Purchase 'quiet' is one of the most cost-effective and long-term ways of reducing noise in the workplace. Therefore, consider the noise produced by the plant/equipment at the time of procurement and if possible, choose the equipment with the lowest noise output.

(24) Noise emission data should be obtained from suppliers to enable the plant/equipment with the lowest practicable* noise level to be selected. The Managing Noise and Preventing Hearing Loss at Work Code of Practice 2021 provides a structured format for the purchaser seeking information about noise emission values of plant/equipment.

(25) Refer to Safe Procurement and Acquisition of Plant and Equipment Procedure for a comprehensive pre-acquisition check, planning and Risk Assessment information prior to purchasing.

Controlling Noise at the Source – Existing Plant and Workplaces

(26) A good understanding of the operation of the plant or process is needed when considering ways of minimising noise at its source. Where practicable, engineering solutions should be implemented to reduce noise at its source and along the path of transmission.

(27) Examples of engineering control measures include:

a. Eliminating impacts between hard objects or surfaces;

b. Minimising the drop height of objects or the angle that they fall onto hard surfaces;
c. Using absorbent lining on surfaces to cushion the fall or impact of objects;
d. Fitting exhaust mufflers on internal combustion engines;
e. Fitting silencers to compressed air exhausts and blowing nozzles;
f. Isolating a vibrating noise source to separate it from the surface on which it is mounted using rubber mounts and flexible connections;
g. Ensuring gears mesh together better;
h. Fixing damping materials (such as rubber) or stiffening to panels to reduce vibration;
i. Fitting sound-absorbing materials to hard reflective surfaces;
j. Turning down volume controls;
k. Changing fan speeds or the speeds of particular components; and
l. Changing the type of material, the equipment or its parts are made of (change metal components to plastic components).

Controlling Noise Along its Pathway

(28) Examples of isolating the source of noise from workers include:

a. Building enclosures or sound-proof covers around noise sources;
b. Using barriers or screens to block the direct path of sound;
c. Locating noise sources further away from workers; and
d. Using remote controls to operate noisy plant from a distance.

Controlling Noise Exposure at the Receiver

(29) Administrative noise control measures reduce the time of exposure to a noisy hazard. Where practicable the following strategies should be implemented:

a. Hearing protection devices.
b. Staff rotation.
c. Organising schedules so that noisy work is done when no or only a few workers are present.
d. Notifying workers and others in advance of noisy work so they can limit their exposure.
e. Keeping workers out of noisy areas if their work does not require them to be there.
f. Sign-posting noisy areas and restricting access.
g. Providing quiet areas for rest breaks.
h. Equipment maintenance programs.
i. Redesign/refurbish of the work area to minimise noise exposure.

(30) Administrative controls for reducing noise exposure should be reviewed regularly to ensure they are being complied with and are effective.

Hearing Protection Areas

(31) Areas where workers may be exposed to hazardous noise should be designated ‘hearing protection areas’ and include signposting with a 'white on blue' earmuffs symbol.

(32) No staff member, student, or visitor should enter a hearing protection area while hazardous noise is present, even for brief periods, unless they wear appropriate personal hearing protection. Regular checks on worker compliance with the wearing of hearing protection should be undertaken.

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Provision of Personal Hearing Protection

(33) Personal hearing protection (PHP) (such as earmuffs or plugs) should be provided to workers and maintained by the relevant school or Organisational Unit.

(34) Contractors are to provide their own PHP, if PHP is required.

(35) If a worker chooses to use their own PHP, approval must be sought from their supervisor, Work Health and Safety Coordinator (WHSC) or HSW Manager as some may not be appropriate for the noise source. Protective equipment should be selected and maintained in accordance with AS/NZS 1269.3:2005 Occupational Noise Management Part 3 - Hearing Protector Program (access via Standards Databases through UQ Library).

(36) To get the full protection of PHP, workers must always wear their PHP whenever they are exposed to hazardous noise during their work. If the PHP is removed, even for a short time, the protection provided to the person will be substantially reduced.

(37) A target should be set for in-ear noise exposure level that is below the exposure standard for noise, e.g.: 80dB(A). An in-ear noise level is the noise level received in a person's ear when using PHP.

(38) Then, based on the workplace noise exposure levels and the target in-ear noise exposure level, the workplace risk assessment will determine what level of hearing protection will correctly reduce (attenuate) the noise intensity received in a staff member's ear.

(39) Once the hearing protection level has been determined by the noise assessment, there should be a suitable range of PHP for workers to choose from so they can select the type that suits them best.

(40) Workers should always be involved in the PHP selection process and offered a reasonable choice from a range of types. Where necessary, obtain professional advice from local health, safety and wellness staff and from the HSW Division when selecting PHP.

Select PHP Rated to the Appropriate Class or SLC80

(41) It is important that all PHP has the appropriate protection rating.

(42) There are two approved methods for testing hearing PHP in Australia, with the results stated as Class or SLC80.

(43) The class of hearing protection is determined by a testing regime prescribed by AS/NZS 1270:2002 Acoustics - Hearing Protectors (access via Standards Databases through UQ Library) and is marked on the packaging of the device.

(44) AS/NZS 1269.3:2005 Occupational Noise Management Part 3 - Hearing Protector Program (access via Standards Databases through UQ Library) recommends the class testing method is used in most circumstances,

(45) To identify the class of hearing protection, only an 8-hour average value is needed to which the person is exposed in dB(A) and then refer to Table 4 in the Managing Noise and Preventing Hearing Loss at Work Code of Practice 2021, which details the five classes of hearing PHP. These are:

Measured exposure dB(A)	Class
Less than 90	1
90 to less than 95	2
95 to less than 100	3
100 to less than 105	4

Measured exposure dB(A)	Class
105 to less than 110	5

(46) For information on the SLC80 (Sound Level Conversion valid for 80% of the wearers) measuring method, refer to the Managing Noise and Preventing Hearing Loss at Work Code of Practice 2021.

(47) Suppliers of hearing protectors should provide the full information on the attenuation likely to be provided including the SLC80 ratings, class and octave band attenuation values. The attenuation values should be derived from attenuation measurements made in accordance with AS/NZS 1270:2002 Acoustics - Hearing Protectors (access via Standards Databases through UQ Library).

(48) Providing or using PHP measured by the Noise Reduction Rating (NRR) system is not acceptable in Australia. The NRR system is used in the United States of America (USA) but cannot be used in Australia due the different testing method required by AS/NZS 1270:2002.

(49) PHP should not be provided that under-protects or over-protects a worker's hearing.

(50) It is important to note that providing PHP that over-protects a staff member (i.e. the PHP is rated higher than the protection level determined by the workplace noise assessment) cuts out too much sound and may cause staff to experience disadvantages, such as:

a. difficulty in communication, in hearing verbal instructions – even warning signals;
b. feelings of isolation; and
c. discomfort (e.g., heavy-duty earmuffs are heavier to wear and have a higher clamping force on the head).

(51) The effectiveness of PHP is reliant on:

a. its condition;
b. whether it fits the operator correctly;
c. the suitability of the hearing protectors for both the noise level and staff comfort;
d. the workplace environment (e.g. ear-plugs are difficult to use hygienically for work that requires them to be inserted with dirty hands and in these circumstances ear-muffs are more appropriate; however, ear-muffs can be uncomfortable to wear in hot environments and can make it difficult for the wearer to enter a confined space or to wear a helmet. Therefore, hearing proctors should be chosen taking into consideration the working environment); and
e. the PHP compatibility with other equipment used by the staff member (e.g. spectacles, eye protection, hard hats, respirators, etc.).

(52) Workers must be provided with training, information and instruction about their PHP including:

a. the proper use;
b. the proper fit; and
c. how to care for, maintain and store the PHP.

(53) Safe work procedures should be established, and workers trained to understand the importance of:

a. applying their PHP before entering any hazardous noise area;
b. always using their PHP when in identified hazardous noise areas;
c. how to report defects in hearing protectors and noise control equipment; and
d. how to raise any concerns regarding hazardous noise.

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(54) Supervisors should also:

a. appoint a person to issue and make sure replacements are readily available; and
b. carry out spot checks to ensure staff are using their hearing protectors where and when required, and using them correctly.

(55) All managers and supervisors should always set a good example and wear PHPs when required in hearing protection areas.

(56) In cases where students or contractors are required to work in hearing protection areas, the school or Organisational Unit should decide who should provide suitable hearing protection. Students and contractors should be provided with information regarding the noise levels and the requirement for hearing protection, which must be correctly fitted and worn throughout the duration of period of noise exposure.

(57) The provision of hearing protection should not be considered as an alternative to more effective controls (as outlined above). Hearing protection is poorly tolerated, especially in warm climates, and should therefore always be considered as a last choice or a supplementary measure.

Section 5 - Audiometric Testing Program

(58) Audiometric testing is an important part of managing risks from exposure to hazardous noise and ototoxins. Commencing audiometric testing before staff are exposed to hazardous noise and ototoxins provides a baseline as a reference for future audiometric tests. Supervisors must ensure that UQ workers (excluding students and contractors) routinely exposed to the following circumstances in the workplace, as identified through the risk assessment process, attend audiometric testing:

a. Exposure to workplace noise equal to or greater than an LAeq,8h of 82dB(A) or an LC,peak of 137 dB(C).[1]
b. Workers are exposed to any of the ototoxic substances listed in Appendix B of the Managing Noise and Preventing Hearing Loss at Work Code of Practice 2021 where the airborne exposure is greater than 50 per cent of the workplace exposure standard for the substance (without regard to respiratory protection worn), regardless of the noise level.
c. Ototoxic substances at any level and noise with LAeq,8h greater than 80dB(A) or LC,peak greater than 135dB(C).
d. Hand–arm vibration at any level and noise with LAeq,8h greater than 80dB(A) or LC,peak greater than 135dB(C).

(59) The UQ School of Health and Rehabilitation Sciences - Audiology Clinic will perform audiometric testing and assessment of audiograms at St Lucia and Gatton, in accordance with the procedures outlined in AS/NZS 1269.4:2014 Occupational Noise Management Part 4 - Auditory Assessment (access via Standards Databases through UQ Library).

(60) A copy of the audiometric testing results will be available to the worker via Workday following the assessment. The results of the audiometric test may need to be discussed with the UQ Occupational Physician and the UQ Occupational Hygienists. Records will be retained for 25 years and held in accordance with the Privacy Policy.

Ongoing Testing

(61) Ongoing audiometric testing is required at least two-yearly for UQ workers who continue to be exposed. However, more frequent audiometric testing may be needed if exposures are at a high $L_{Aeq,8h}$, which is equal or greater to 100dB(A). These tests should be undertaken well into the work shift so that any temporary hearing loss can be detected.

(62) A full reference assessment will be conducted every 10 years and workers must undergo an exit examination on leaving employment with UQ. Full review assessments may also be required if any significant changes in hearing thresholds are noted.

(63) Ongoing audiometric testing will be conducted at the School/Faculty/Institute's expense. It is the School/Faculty/Institute's responsibility to ensure compliance with this program and the HSW Division will follow-up with any non-compliance issues.

Referrals for Audiometry

(64) Referrals for audiometric testing is done via Workday by the worker's supervisor on the "UQ Health Monitoring (audiometry) Assessment Request Form – Hazardous Noise" (available on the Health Monitoring website) and must be completed:

a. For the initial request for audiometry.
b. At the time of repeat audiometry.

(65) A separate form is completed for each worker requiring audiometry. This form is submitted and initiated through the Workday Health Monitoring process. The Health, Safety and Wellness Division will then review the audiometry requirements based on the information provided.

(66) For information on the Workday health monitoring process refer to Health Monitoring website.

(67) Workers enrolled in the audiometry testing program will be offered an exit hearing test on leaving employment with UQ or shortly after.

Education and Training

(68) Schools and Organisational Units should inform relevant staff and students on hazardous noise risk management measures and the health and safety risks of noise exposure, including providing the information in this Guideline.

Section 6 - Appendix

Definitions

Term	Definition
dB	When you measure noise levels with a sound level meter, you measure the intensity of noise called decibel units (dB). The human ear does not respond equally to all frequencies. For this reason, sound meters are usually fitted with a filter whose response to frequency is a bit like that of the human ear. If the "A weighting filter" is used, the sound pressure level is given in units of dB(A) or dBA, and likewise if the If the "C weighting filter" is used, the sound pressure level is given in units of dB(C) or dBC.
Exit hearing test	Occurs when a worker is exiting employment. The reason for the Exit Hearing Test is to obtain a final assessment to show any changes from the baseline and any other routine hearing tests.
Nuisance noise	Includes high levels of background noise (e.g. from computers, scientific instrumentation or building works) and certain types of sound (e.g. high pitched, irregular, intermittent or rhythmic) that can interfere with verbal communication and affect work efficiency.

Term	Definition
UQ workers	For the purposes of this Guideline includes: • staff - continuing, fixed-term, research (contingent funded) and casual staff; • contractors, subcontractors and consultants (excluded from audiometry); • visiting academics and researchers; • academic title holders, visiting academics, emeritus professors, adjunct and honorary title holders, industry fellows and conjoint appointments; • higher degree by research students; and • volunteers and students undertaking work experience (excluded from audiometry).

[1] As the exposure standard for hazardous noise protects most but not all people, UQ has adopted a 3-decibel level lower than the exposure standard to trigger audiometry.

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