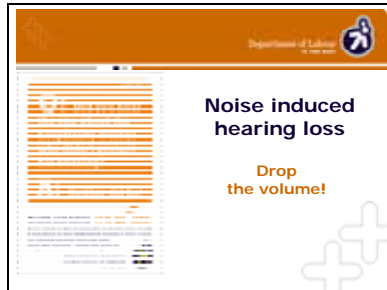
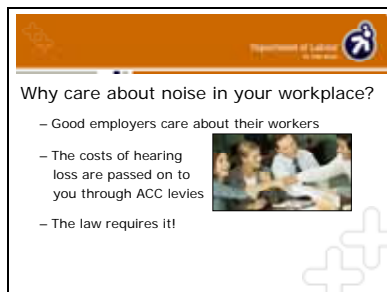


TALKING NOTES TO ACCOMPANY POWERPOINT PRESENTATION ON NOISE INDUCED HEARING LOSS:

Slide 1: Cover



Slide 2:



Accompanying notes for Slide 2:

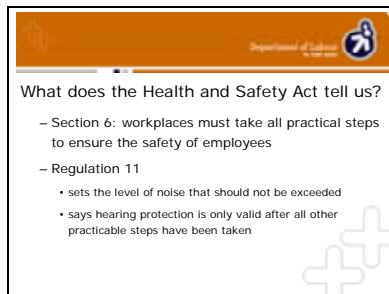
Good employers care about their workers. Exposure to any noise that is sufficiently loud can damage a person's hearing. We depend on hearing to communicate, to socialise, to learn, to be warned, to be entertained, and to interact with our environment.

Hearing loss from noise destroys a person's ability to hear some higher pitched sounds, so it can be harder to understand what people are saying. This can affect how people communicate at work, with loved ones, and with friends.

Hearing loss also costs businesses dearly. Noise Induced Hearing Loss is of major concern to organisations like ACC. ACC data reveals a substantial increase in the number of new claims annually, rising from 2823 in the year to June 1996, to 5580 in the year to June 2006. Together with ongoing claims, the overall costs of hearing loss claims increased by an average of 20 percent each year (a six-fold increase over the decade). Under the ACC system, these costs are in turn levied on industry.

And the Health and Safety in Employment Act (HSE) requires workers provide a safe workplace.

Slide 3:

A presentation slide with an orange header containing the Department of Labour logo. The main text asks 'What does the Health and Safety Act tell us?' and lists: '- Section 6: workplaces must take all practical steps to ensure the safety of employees', '- Regulation 11' with sub-points: '• sets the level of noise that should not be exceeded' and '• says hearing protection is only valid after all other practicable steps have been taken'. A white staircase graphic is in the bottom right corner.

What does the Health and Safety Act tell us?

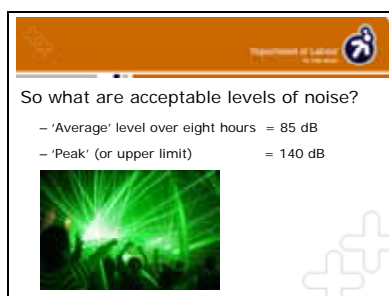
- Section 6: workplaces must take all practical steps to ensure the safety of employees
- Regulation 11
 - sets the level of noise that should not be exceeded
 - says hearing protection is only valid after all other practicable steps have been taken

Accompanying notes for slide 3:

Section 6 of the HSE Act requires employers to take all practicable steps to ensure the safety of employees at work, and to provide a safe working environment.

Regulation 11 of the Health and Safety in Employment Regulations 1995 states the levels of noise exposure that should not be exceeded. The regulation further states that hearing protection is only a valid means of control when all other practicable steps have been taken to reduce noise below acceptable levels.

Slide 4:

A presentation slide with an orange header containing the Department of Labour logo. The main text asks 'So what are acceptable levels of noise?' and lists: '- 'Average' level over eight hours = 85 dB' and '- 'Peak' (or upper limit) = 140 dB'. There is a small image of green laser light. A white staircase graphic is in the bottom right corner.

So what are acceptable levels of noise?

- 'Average' level over eight hours = 85 dB
- 'Peak' (or upper limit) = 140 dB

Accompanying notes for slide 4:

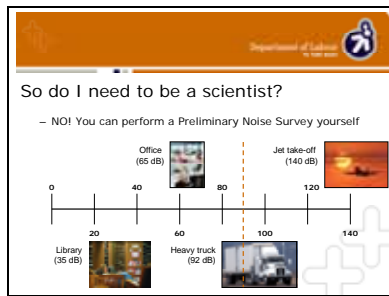
Regulation 11(1) sets the exposure criteria for noise. There are two exposure limits – an “average” level (over 8 hours) of 85dBA, and a “peak” level of 140dB.

Peaks are very loud sounds of very short duration, like impact noise, or a gun firing. Peak levels are very important because at 140dB, a person can be exposed to the same amount of sound energy in less than one second as they would be at an average of 85dBA for 8 hours. Because of the short duration, the damage may be done before a person has a chance to move away or protect themselves in other ways.

Regulation 11(1) states clearly that “all practicable steps” must be taken to reduce an employee’s exposure to noise so that it does not exceed the exposure standards. The regulation states that using hearing protectors does not remove the requirement for the reduction in noise exposure.

Regulation 11(3) states that use of hearing protectors can only be used as a permanent solution to protect peoples hearing if all the practicable steps taken in Regulation 11(1) failed to reduce workers exposure to below the exposure limits.

Slide 5:



Accompanying notes for slide 5:

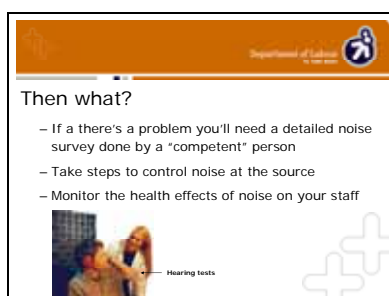
There is a lot that businesses can do, before they need to think about calling in experts.

A preliminary assessment is often called a walkthrough survey. It is done to identify the areas in a place of work where noise levels are likely to, or actually, exceed the exposure limits. The results of the preliminary assessment should determine which tasks, processes or areas in the workplace require detailed assessment.

Preliminary assessments usually do not require sophisticated equipment or highly trained personnel. The emphasis is on identification of potential noise hazards, rather than full assessment of that noise. Preliminary assessments should be carried out when there has been no previous assessment, or when previous assessments are 5 or more years old.

Preliminary assessments often find noise sources or processes where simple noise control measures may be introduced before conducting a detailed assessment. For example, fastening down a loose vibrating panel on a machine. Employers should consider whether the preliminary assessment provides enough information to implement noise control measures. A subsequent detailed assessment would then be performed to evaluate the effectiveness of the controls in place.

Slide 6:



Accompanying notes for slide 6:

The aim of a noise hazard assessment is to assess the noise environment and to establish whether or not the workplace contains noise that exceeds the exposure limits. A detailed assessment is required:

- Where complex noise sources are present;
- If there is doubt about whether the noise levels exceed the exposure

- limits; or
- If there is any reason to believe, (such as from preliminary assessment results), that noise levels are, or may exceed the exposure limits.

Detailed assessments will provide information that will:

- Quantify the amount of noise to which employees are exposed;
- Help identify sources of noise;
- Assist in developing noise control strategies; and
- Determine appropriate hearing protector needs.

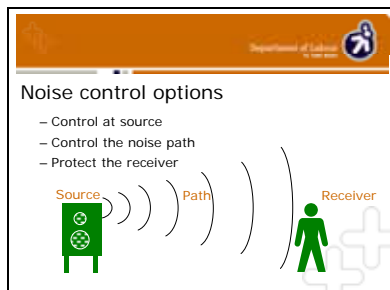
Detailed noise assessments must be carried out by a competent person.

Most permanent hearing loss does not happen immediately – loss occurs over time. Hearing loss can be temporary at first. Any temporary loss of hearing should be taken as a warning that the person is at risk of permanent hearing loss.

Where a detailed noise assessment shows noise levels to be above the exposure limits, or for any reason it is assumed the noise level exceeds the exposure limits:

- An employer must gain the informed consent of employees exposed to noise that exceeds the exposure limits to carry out audiometric tests; and
- An employer must arrange for those audiometric tests to be carried out.
- (This is required by Section 10 of the Health and Safety in Employment Act 1992.)

Slide 7:



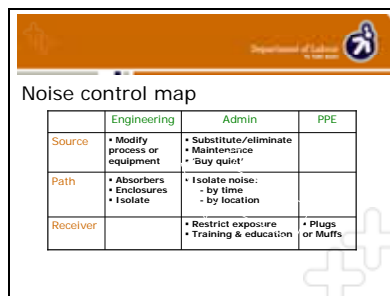
Accompanying notes for slide 7:

Every noise problem (and every airborne health and safety problem) has three basic elements:

- **A source:** from which the noise originates and radiates;
- **A path:** along which the noise travels. The noise path includes passage through the air, or along or through an object such as a wall or pipe;
- **A receiver:** the ears of the person hearing the sound.

Noise can be controlled at the point of **source**, by blocking the **noise path**, or protecting the **receiver**. Noise control options centred on the noise source are the most effective, while noise control options centred on protecting the receiver are the least effective. Receiver-based options control exposure to noise rather than the noise itself.

Slide 8:



The slide features a header with the Department of Labour logo and the text 'Department of Labour'. Below the header is a table titled 'Noise control map'. The table has four columns: 'Engineering', 'Admin', and 'PPE'. The rows are 'Source', 'Path', and 'Receiver'. The 'Source' row lists 'Modify process or equipment' under Engineering and 'Substitute/eliminate', 'Maintenance', and 'Buy quiet!' under Admin. The 'Path' row lists 'Absorbers', 'Enclosures', and 'Isolate' under Engineering; 'Isolate noise: - by time - by location' under Admin; and 'Plugs or Muffs' under PPE. The 'Receiver' row lists 'Restrict exposure' and 'Training & education' under Admin, and 'Plugs or Muffs' under PPE.

	Engineering	Admin	PPE
Source	<ul style="list-style-type: none">• Modify process or equipment	<ul style="list-style-type: none">• Substitute/eliminate• Maintenance• Buy quiet!	
Path	<ul style="list-style-type: none">• Absorbers• Enclosures• Isolate	<ul style="list-style-type: none">• Isolate noise:<ul style="list-style-type: none">- by time- by location	
Receiver		<ul style="list-style-type: none">• Restrict exposure• Training & education	<ul style="list-style-type: none">• Plugs or Muffs

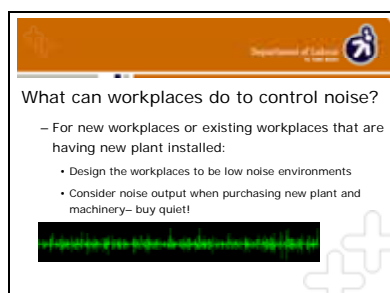
Accompanying notes for slide 8:

It is not expected that employers will become experts in noise reduction techniques. The employers' role is to ensure that noise reduction techniques are used where possible, and that "all practicable steps" are taken to reduce noise at source. We'll look at some tips about doing this in a few moments.

The noise control map highlights the need to think about controlling noise at the source, or the path. There may be engineering solutions, or administration solutions – how we organise the way people work. Personal protective equipment like ear-plugs or muffs should be seen as a last resort.

Let's look at what workplaces can do to control noise.

Slide 9:



The slide features a header with the Department of Labour logo and the text 'Department of Labour'. Below the header is the text 'What can workplaces do to control noise?' followed by a list of bullet points: '- For new workplaces or existing workplaces that are having new plant installed: • Design the workplaces to be low noise environments • Consider noise output when purchasing new plant and machinery- buy quiet!'. At the bottom of the slide is a small image of a sound wave.

Accompanying notes for slide 9:

There may be simple engineering solutions that may help you reduce the levels of noise. Examples of particular engineering measures which may be implemented include:

- Eliminate or replace the plant or its operation by a quieter operation with equal or better efficiency;
- Replace the noisy plant by installing newer equipment designed for operating at lower noise levels;
- Correct the specific noise source by minor design changes;
- Maintain plant properly. Badly worn bearings and gears, poor lubrication, loose parts, slapping belts, unbalanced rotating parts and steam or air leaks all create noise which can be reduced by good maintenance;
- Correct the specific plant elements causing the noise by a local source approach, rather than by consideration of the entire plant as a noise source. For example, noise may be reduced by adding noise barriers, noise enclosures, vibration isolation mountings, lagging to dampen vibrating

surfaces, mufflers or silencers for air and gas flows, or reducing air velocity or free jets. These may be considered as a solution for the individual noise-producing elements of the total operation.

- Move the noisy elements which need not be an integral part of the basic plant. For example, move pumps, fans and air compressors that service the basic machine. NOTE: Separation is only effective where room surfaces tend to absorb sound;
- Isolate the vibrating plant parts to reduce airborne noise from vibrating panels or guards.

Slide 10:

For existing workplaces

- Write a noise control plan and set priorities
- Identify where noise cannot be controlled
- Consider how to reduce noise

Noise Exposure dB(A)	Duration per day before damage occurs
85	8 hours
88	4
91	2
94	1
97	30 mins
100	15
103	8
106	4
109	2
115	30 secs

Accompanying notes for slide 10:

It must be stressed that the best and most cost-effective time to consider noise reduction is at the design stage. But there are a lot of easy and practical steps that can help reduce noise:

- Maintain machinery so blunt, worn, or loose parts don't make the job noisier than it has to be
- Modify plant or machinery so it is quieter
- Substitute a noisy way of doing a job for a quieter way

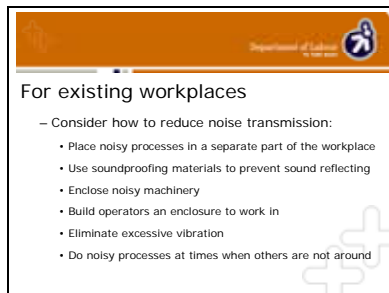
Turning the sound level down in the hospitality industry:

The human ear is not particularly good at detecting the differences in volume, particularly at higher sound levels. By way of example, a sound level of 97dB(A) – not unusual in nightclubs – delivers twice as much energy to the ear as one of 94dB(A), yet it doesn't appear twice as loud.

While turning the sound level down may not be a practicable way to completely eliminate hazardous exposures, consideration must be given to at least partial elimination before moving on to consider isolation.

Accepted exposure times for noise before damage occurs	
Noise Exposure dB(A)	Duration per day before damage occurs
85	8 hours
88	4
91	2
94	1
97	30 min
100	15
103	8
106	4
109	2
115	30 secs

Slide 11:



For existing workplaces

- Consider how to reduce noise transmission:
 - Place noisy processes in a separate part of the workplace
 - Use soundproofing materials to prevent sound reflecting
 - Enclose noisy machinery
 - Build operators an enclosure to work in
 - Eliminate excessive vibration
 - Do noisy processes at times when others are not around


Accompanying notes for slide 11:

If it is not possible to change or modify the noise-generating equipment or processes by engineering noise reduction procedures, treatment of the noise transmission path between the source and the exposed employee should be investigated.

Methods include isolating the noise-emitting object(s) in an enclosure or placing them in a room or building away from the largest number of employees and then acoustically treating the area to reduce noise to the lowest levels practicable.

As an alternative, it may be desirable to protect the employee(s) instead of enclosing the sound sources. In this case, design of the soundproof room or sound-reducing enclosures should still follow the same principles.

Slide 12:



Thinking about enclosures

The diagram illustrates a person working at a machine. A sound enclosure is shown around the machine, with an arrow indicating sound waves being blocked by the enclosure. The person is standing outside the enclosure, and the machine is inside it.

Accompanying notes for slide 12:

For noise, isolation generally involves creating a sound enclosure, or a partition to provide a level of protection to employees and others. It may also involve isolation in time, using the “administrative” control of job rotation, which limits exposure time.

It may be desirable to protect the employee(s) instead of enclosing the sound sources. Materials which are good noise barriers, for example lead, steel, brick and concrete, are poor absorbers of sound. The denser and heavier the material, the better the noise barrier. However, the material will also reflect sound well. To reduce the reflection of sound, a good sound absorber is needed.

Sound absorption works by reducing noise reflection by eliminating or reducing the sound pressure wave, or allowing noise to pass through material. Good sound absorbers — for example, some polyurethane foams, dacron, fibreglass, rock-

wool and thick pile carpet — are also very poor barriers to the transmission of sound.

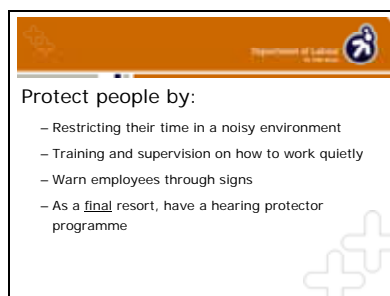
The two types of material (barriers and absorbers) should therefore be used in combination to obtain the best effect.

Isolation strategies specific to hospitality industry:

Particularly at the time of design, or re-design, options for isolation include:

- fitting of an acoustic screen to shield bar staff from direct sound from a band or speakers
- fitting of acoustic absorption behind the bar to reduce reverberation
- fitting of acoustic doors and acoustic double glazing between the entertainment area and kitchen/office areas
- screening off of foyer areas with acoustic doors, to shield door staff from noise levels
- lining of walls with acoustic absorption to reduce reverberation
- in the case of discos/clubs, fitting of a 'sound ceiling' above the dance floor, with speakers directed downwards which can lower the sideways propagation by as much as 10dB.

Slide 13:



Accompanying notes for slide 13:

The most effective and reliable way to prevent and control this significant hazard is to eliminate, or at least quieten the sources of noise to which employees are exposed. Measures such as job rotation and the use of hearing protectors are only acceptable as control options if:

- They are used as short-term measures while a more permanent noise reduction or isolation solution is being implemented; or
- All practicable steps have been taken to eliminate or reduce the noise output of a noise source, but this has not reduced noise exposure of employees to a level lower than the exposure limits; or
- All practicable steps have been taken to isolate employees from the noise source, but this has not been achievable, and they are still exposed to noise in excess of the exposure limits.

Use of hearing protectors in many situations is the only means of control that is left for employers. However, hearing protection in the form of earmuffs or plugs is often a misused control option. Its effectiveness in protecting employees' hearing depends on:

- Selecting the correct device;

- Having the device fit an individual properly; and
- The amount of time the hearing protector is actually worn while an individual is exposed to hazardous noise.

For these reasons, an employer is not meeting their responsibilities under Section 6 of the Act, or Regulation 11 if they provide hearing protection without taking all practicable steps to reduce noise exposure to a level below the hazard criteria.