WORKSAFE

Health Risk Management

The Regulator's perspective

NZOHS Conference

Jim Napier, Kerry Cheung, Philippa Gibson
Health & Technical Services
May 2019

A typical worker is

10 TIMES

more likely to die from work-related ill-health than a workplace safety incident

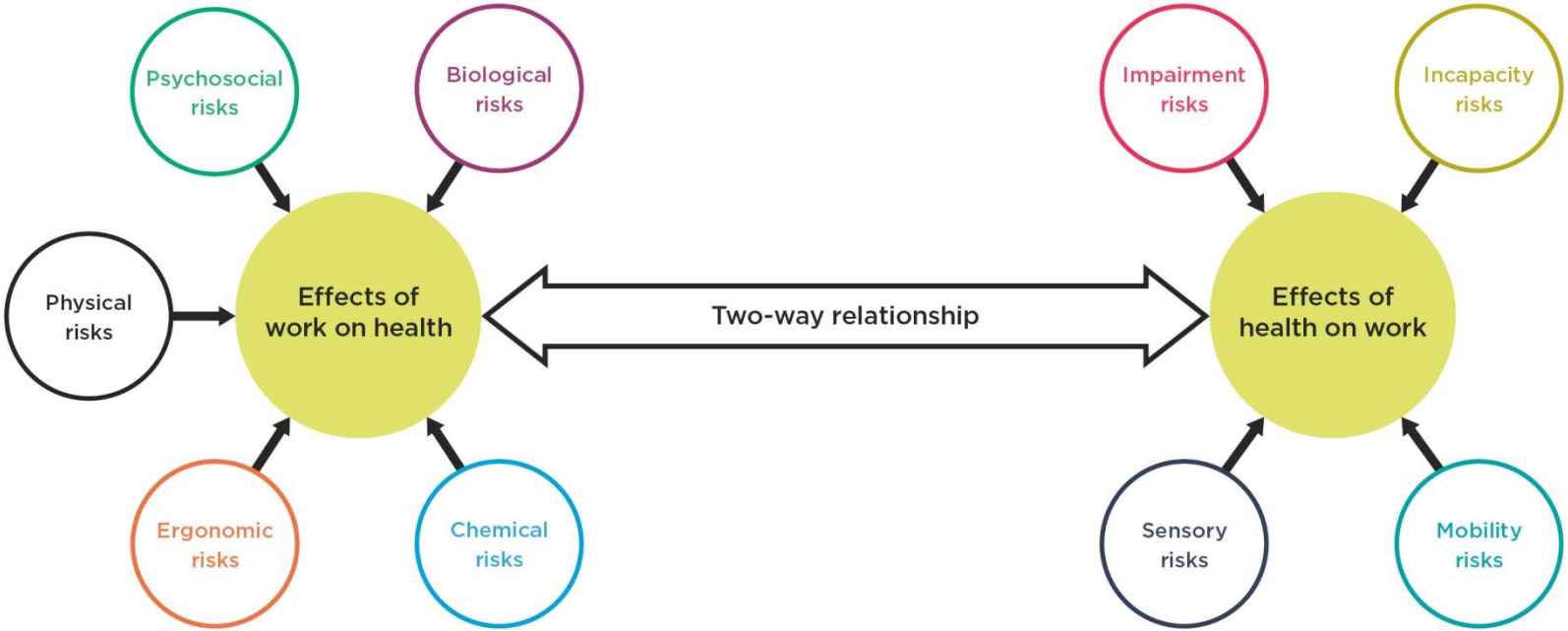
Our strategic approach to delivering the vision

VISION AND OUTCOMES

- Vision: EVERYONE WHO GOES TO WORK COMES HOME HEALTHY AND SAFE
- System target: Fewer people experience work-related ill-health
- Substantive impacts: Work-related health risks managed better. Exposures to health hazards are reduced
- Immediate impacts: Awareness, attitudes and behaviours related to work-related health improve

STRATEGIC PLAN

- Work-related health strategic themes:
  - THEME 1: INDUSTRY LEADERSHIP
  - THEME 2: REGULATORY EFFECTIVENESS
  - THEME 3: STEP CHANGE

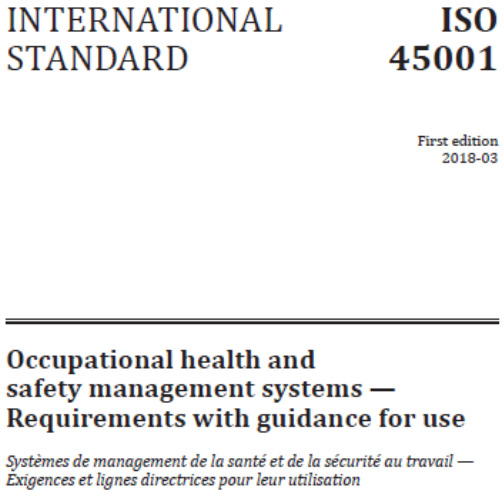

Psychosocial risks
Biological risks
Physical risks
Effects of work on health
Ergonomic risks
Chemical risks
Two-way relationship
Impairment risks
Incapacity risks
Effects of health on work
Sensory risks
Mobility risks

1 WHAT IS RISK?

AS/NZS 31000:2009 – Risk Management Principles and Guidelines

ISO 31000:2018 – Risk Management Guidelines

ISO 45001:2018 – Occupational health and safety management systems



ISO 31000

Risk = the effect of uncertainty on objectives

- an effect is a deviation from the expected outcome/objectives
- uncertainty is a deficiency or shortfall in information
- objectives could relate to financial, environmental, or health and safety

can be positive, negative, can result in an opportunity or threat

Risk = the effect of uncertainty on objectives

Work related health objectives

Any ideas?

Work Related Health objectives

- ✓ **No-one gets work related disease from our workplace**
- ✓ **No one suffers adverse health effects**
- ✓ **No worker develops cancer from working here**
- ✓ **No one develops hearing loss**
- ✓ **Exposure managed to <25% of exposure standards**

RISK = the EFFECT of UNCERTAINTY on OBJECTIVES

Risk = the effect of uncertainty on objectives

Uncertainties in meeting our objectives

What uncertainties you can think of for these two objectives:

- ✓ **No worker develops cancer from working here**
- ✓ **No one develops hearing loss**

Uncertainties in meeting our objectives

Uncertainties for the two objectives:

No worker develops cancer from working here

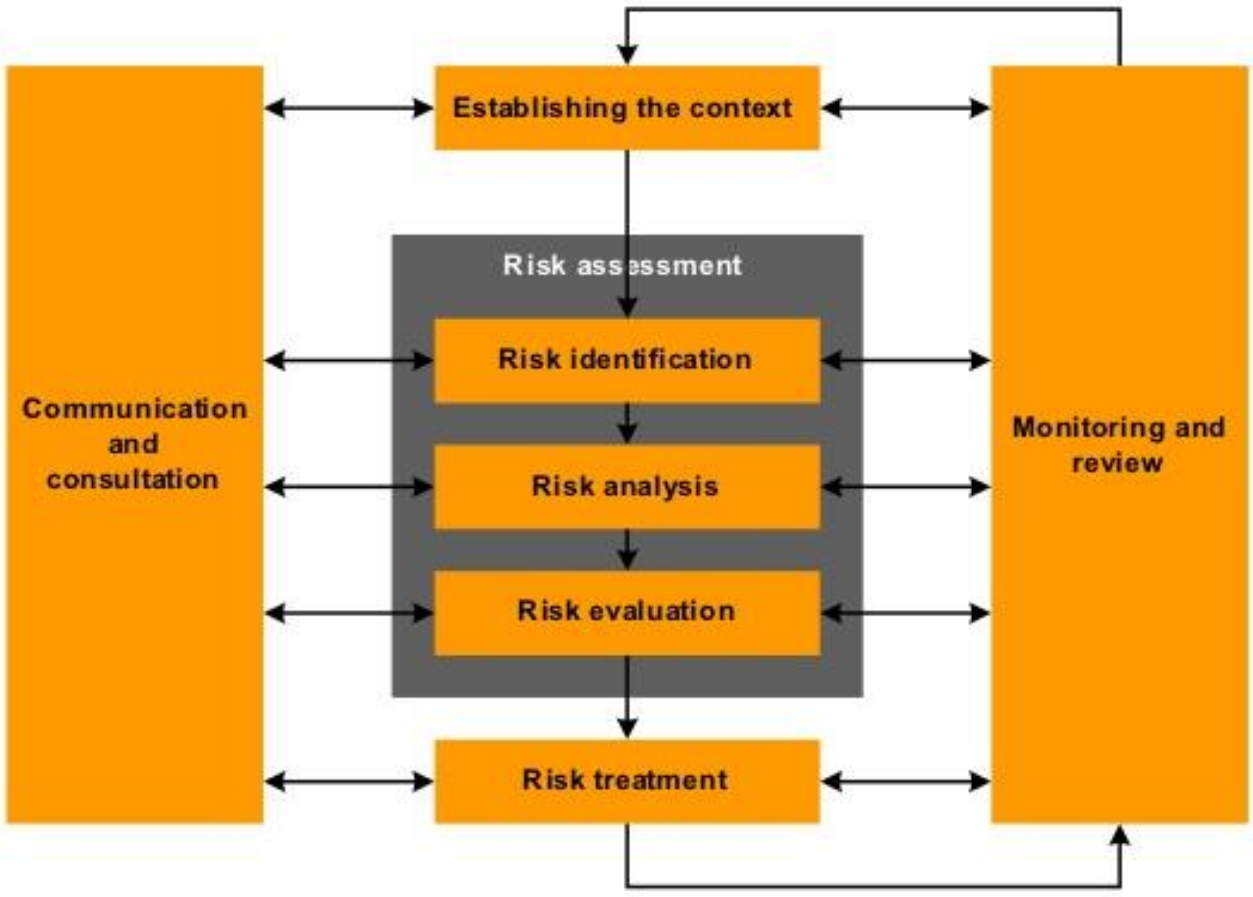
- Don’t know all sources of carcinogen
- We know sources but not routes of exposure
- We don’t know effectiveness of controls (LEV, RPE etc)
- We don’t know the exposure levels in the workplace
- If a cancer develops, was it from working here?

No one develops hearing loss

- We don’t know the real exposure levels
- We don’t know the effectiveness of controls (enclosures, HPE etc)
- Individual susceptibility
- Are there any non-work exposures?
- How about exposure to ototoxic agents?

2 HEALTH RISK MANAGEMENT

31000 MODEL


Establishing the context
Risk assessment
Risk identification
Risk analysis
Risk evaluation
Risk treatment
Communication and consultation
Monitoring and review

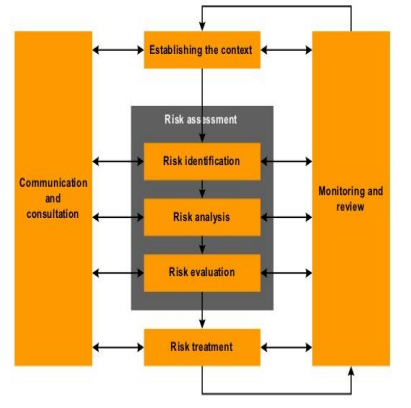
Establish context

i.e. defining the external and internal environment within which the organisation seeks to achieve its objectives in managing risk.

Lets establish the context for our two objectives:

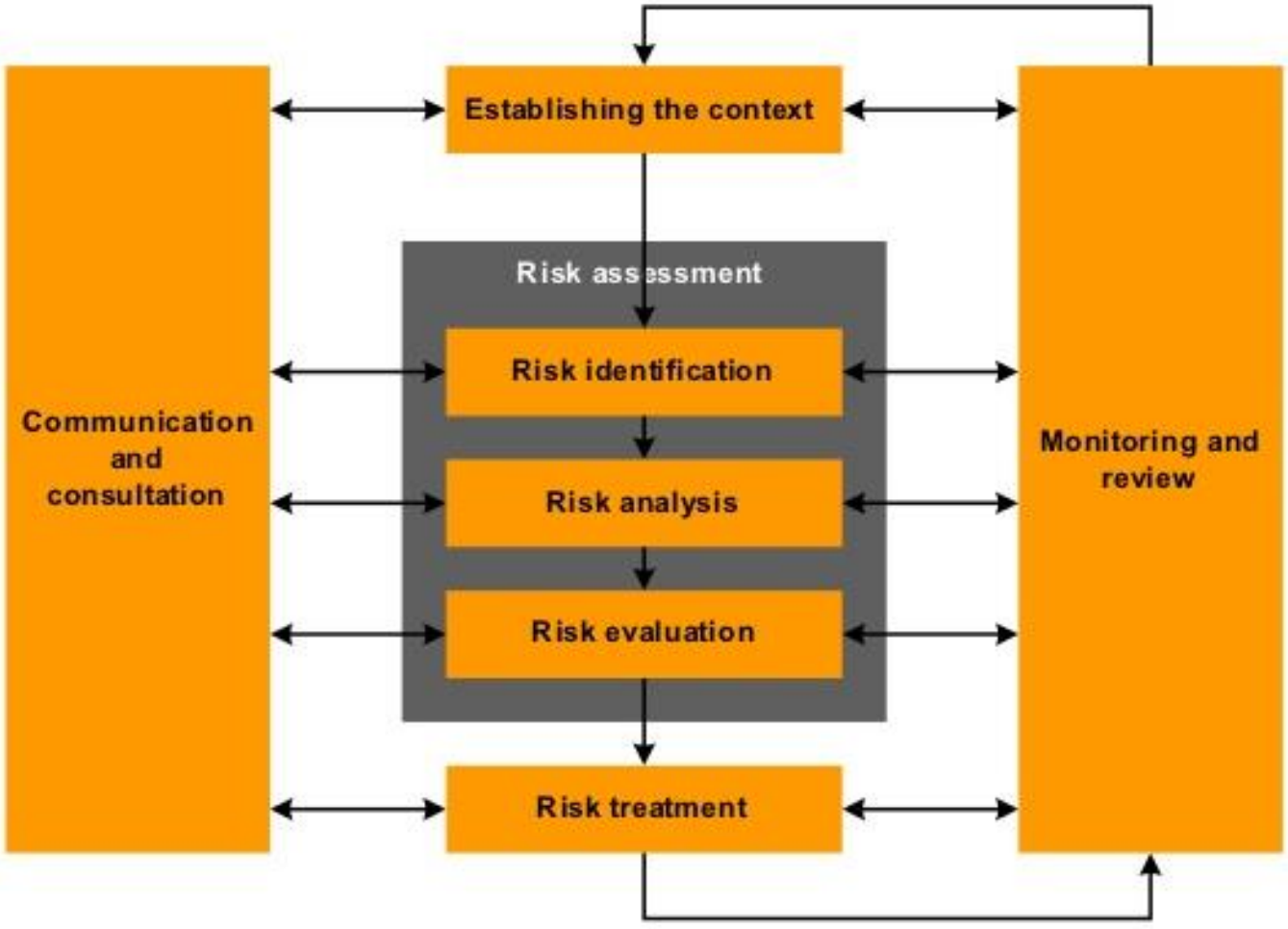
- ✓ **No worker develops cancer from working here**
- ✓ **No one develops hearing loss**

What are the parameters (variables)
? What is the scope
? What are our risk criteria



3 HEALTH RISK ASSESSMENT

31000 MODEL


Establishing the context
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Monitoring and review

Risk identification = Describing risks
(Occ Hyg pillars: Anticipation and Recognition)

Risk analysis= Level of risk
(Occ hyg pillar: Evaluation)

Risk evaluation = Acceptable/tolerable
(Occ Hyg pillar: Evaluation)

RISK IDENTIFICATION (describe risks)

We need to know -

- sources of risk
- what is the harm?
- routes of exposure – does it change?
- who is exposed?
- are there sensitive individuals ?
- what task or jobs cause exposure?
- what variations in exposure can occur?
- what controls are currently mitigating risk?

EXERCISE

- **Identify risks relating to noise in a engineering workshop**
- **Identify risks relating to carcinogens in a welding workshop**
- **Are there any uncertainties to consider?**

Risk identification = Describing risks

Risk analysis= Level of risk

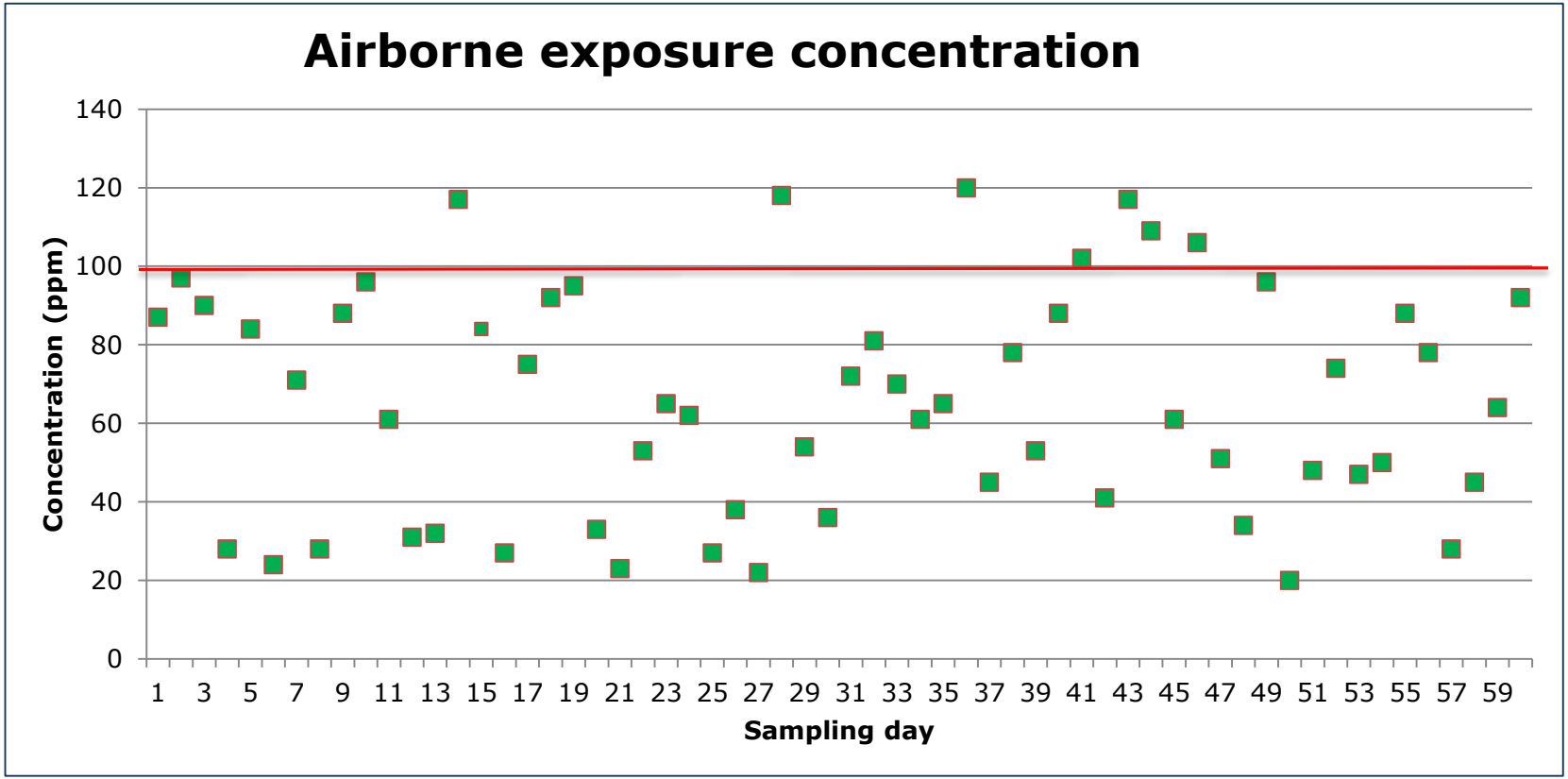
Risk evaluation = Acceptable/tolerable

RISK ANALYSIS (determine level of risk)

- can exposure be measured?
- what is the best method to measure exposure?
- is there potential for error in measurements?
- whose exposure should be measured?
- how do we account for variation in exposure?
- are there controls that affect the risk?

- **How might the level of risk for noise be determined?**
- **How might the level of risk from carcinogens in a welding workshop be determined?**
- **How might the effectiveness of controls be assessed?**
- **Are there any uncertainties to consider?**

EXPOSURE MONITORING UNCERTAINTIES – VARIATION IN EXPOSURE



EXPOSURE MONITORING UNCERTAINTIES

- Computer simulation of 100,000's randomly generated exposure profiles show that using a single sample to 'assess compliance' is highly unlikely to detect clearly unacceptable worker exposure profiles*

- Often a PCBU will only use one sample to assess health risk. For a person working 10 years with exposure every day, 1 day's data is being used to represent the exposure over 2290 days. <0.1% of all exposures is used to determine health risk for this worker

- Reduce uncertainty in exposure assessment with good sampling strategy

*Hewitt (2005) Performance-based exposure assessment Strategies for WES exposure limits.

Risk identification = Describing risks

Risk analysis= Level of risk

Risk evaluation = Acceptable/tolerable

RISK EVALUATION (this is where we compare risk analysis to risk criteria)

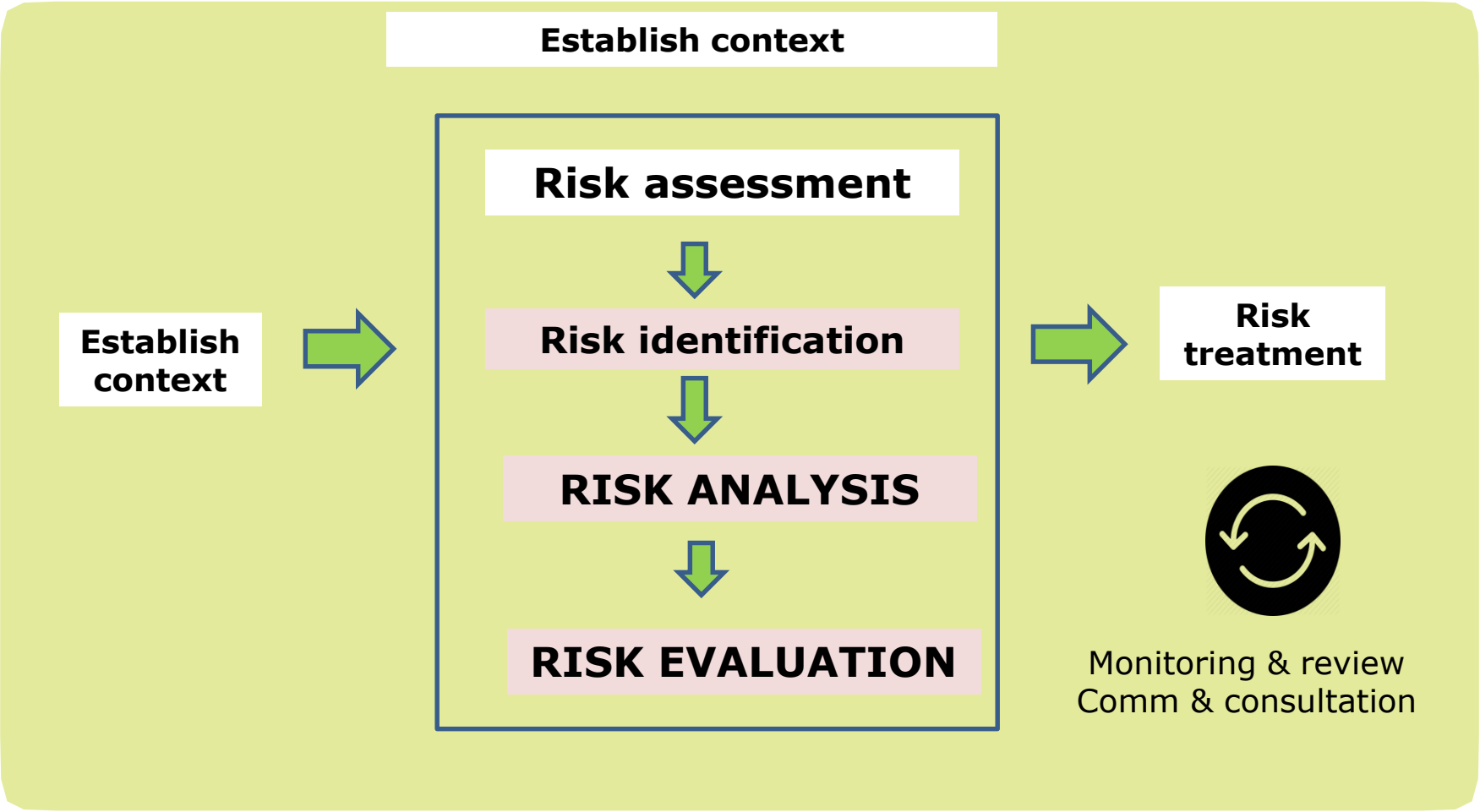
- what are our criteria – WES, noise standards, ventilation flow rates?
- What is an acceptable level of risk for carcinogens? Is 1/10,000 people dying from cancer acceptable?
- Are there any uncertainties to consider? – always think about this

1. **If noise levels are 83 dBA for 8 hours, is that acceptable?**

2. **If airborne exposure levels to carcinogen are 95% of WES, is that acceptable?**

3. **If a respirator with a protection factor of 10, used in an air concentration of 50ppm, for a substance with a WES of 4 ppm, is that acceptable?**

31000 MODEL


Establish context
Establish context
Risk assessment
Risk identification
RISK ANALYSIS
RISK EVALUATION
Risk treatment
Monitoring & review
Comm & consultation

4 WORKPLACE EXPOSURE STANDARDS

Their use in informing health risk assessments

WES

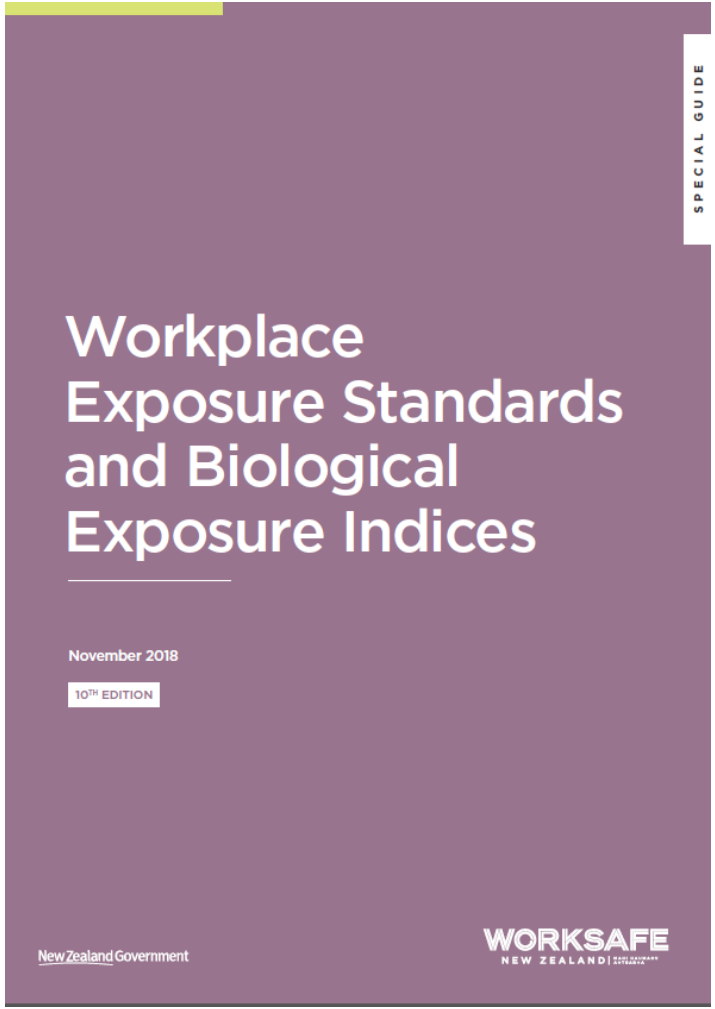
- **Airborne exposure standard**
- **~700 WES. All need to be individually derived**
- **Level at which it is believed that nearly all* workers can be repeatedly exposed to, day after day, without coming to harm.**
- **Set by WorkSafe (except where set by EPA under HSNO S77, 77A or 77B)**
- **To be used as guidelines for risk assessment and used by people qualified in occupational health practice**
- **It is not recommended that untrained persons use WES to determine whether the risk is being adequately managed. Professional judgement and knowledge of limitations are required in making decisions regarding safe levels of exposure to chemical and physical agents found in the workplace.**

***'nearly all' because of individual susceptibility, limitations in tox data**

2018 WES reviews

Purpose of review process:

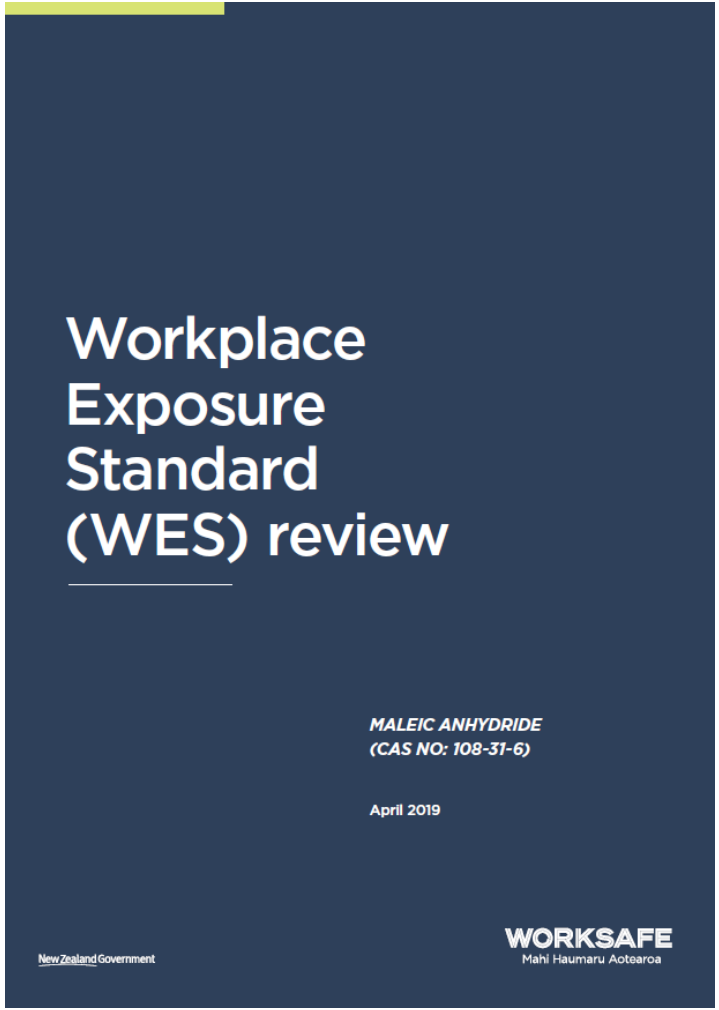
- **To begin to update WorkSafe WES that are out of line with overseas WES**
- **Many WorkSafe WES not been updated since 1994 (>20 years ago)**
- **To review <u>current</u> knowledge**
- **To decide if current knowledge indicates current WES is not protective of health**
- **To propose new WES value where necessary**



2019 WES reviews

What's in a review

- Synonyms
- Chemical and physical properties
- HSNO health-related classifications (6.7A etc)
- Uses & ways in which exposure may occur
- Health effects
- Absorption, distribution, metabolism, excretion
- Exposure standards in other jurisdictions and rationale
- Analytical methods
- Discussion & recommendations
- Glossary
- References


Workplace Exposure Standard (WES) review

MALEIC ANHYDRIDE
(CAS NO: 108-31-6)

April 2019

New Zealand Government

WORKSAFE
Mahi Haumaru Aotearoa

2019 WES reviews

Acetaldehyde
Acrylamide
Acrylonitrile
Antimony trioxide
1,3-Butadiene
n-Butyl acrylate
n-Butyl glycidyl ether
Carbon disulphide
1,2-Dibromoethane
P-Dichlorobenzene
Dichlorvos
Dimethyl sulphate
Epichlorohydrin
Ethyl chloride
Ethylene oxide
Furfural
Glutarldehyde
Glycidol
Hydrazine
Malathion
Maleic anhydride
2-Methoxyethanol
2-Methoxyethylacetate
4,4'-Methylenedianiline
Naphthalene
Phenyl glycidyl ether
Phthalic anhydride
Propylene dichloride
Pyridine
Silica (resp crystalline)
Sulphur dioxide
Thiram
Vinyl cyclohexene dioxide
Wood dust
Styrene (BEI only)

To download Proposal Documents and consider if you want to make a submission go to:

www. TBA

LEGAL DUTIES

HEALTH AND SAFETY AT WORK ACT 2015

Section 17 meaning of PCBU

PCBU means a person* conducting a business or undertaking—
(i) whether the person conducts a business or undertaking alone or with others; and

(ii) whether or not the business or undertaking is conducted for profit or gain.

*Person = a business, a partnership, or a natural person
(A worker is not a PCBU)

LEGAL DUTIES of a PCBU

Section 36 Primary duty of care

A PCBU must ensure, so far as is reasonably practicable, the health and safety of workers working for them, influenced or directed by them, and

A PCBU must ensure, so far as is reasonably practicable, that the health and safety of other persons is not put at risk from work carried out as part of the conduct of the business or undertaking

Health risk management and the law

HSWA - Primary Duty of Care (Section 36(3)(g))

- The PCBU must ensure so far as is reasonably practicable, that the health of workers and the **conditions at the workplace** are monitored for the purpose of preventing injury or illness of workers arising from the conduct of the business or undertaking

General risk and workplace management regulations (reg 29, 30)

- PCBU must ensure that no person at the workplace is exposed to a substance hazardous to health in a concentration that exceeds the prescribed exposure standard

- If PCBU is not certain on reasonable grounds whether the concentration exceeds the relevant prescribed exposure standard, the PCBU must ensure that exposure monitoring is carried out in accordance with regulation 32* to determine the concentration.

* Reg 32 – **exposure monitoring must be carried out by or under the supervision of, a competent person** who has sufficient knowledge, skills, and experience in the appropriate techniques and procedures, including the interpretation of results.

DEFINITIONS

EXPOSURE MONITORING -

means the measurement and evaluation of exposure to a health hazard experienced by a person; and includes
(i) monitoring of the conditions at the workplace; and
(ii) biological monitoring of people (biological monitoring is **NOT** health monitoring – its monitoring for the presence of a substance in the body)

HEALTH MONITORING -

in relation to an individual, means monitoring of the individual **to identify any changes in his or her health status** because of exposure to certain health hazards

Source: Health and Safety at Work (General Risk and Workplace Management) Regulations 2016

Prescribed Exposure Standard – Reg 3 GRWM Regs

Means a workplace exposure standard or a biological exposure index that has the purpose of protecting persons in a workplace from harm to health and that is prescribed in—

- X regulations; or
- X a safe work instrument; or
- ✔ a control under section 77 or 77A, or an exposure limit under section 77B of HSNO Act 1996
- X or a group standard approval issued under section 96B of HSNO

*** WorkSafe WES Book not a Safe Work Instrument**

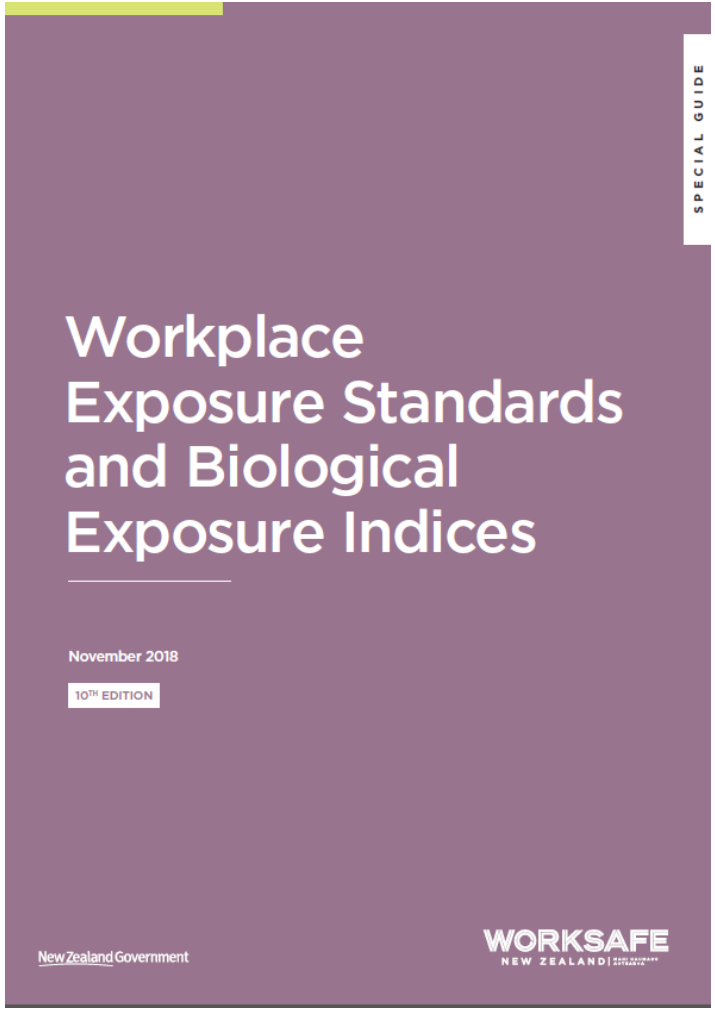
Prescribed Exposure Standard

WES book NOT a Safe Work Instrument

- Reg 29 - no person is exposed to a concentration exceeding the prescribed exposure standard and the WES in the WES book are (mostly) not PES.

So, what is the value in having a WES book?

- Levels at which it is believed that nearly all workers can be repeatedly exposed to, day after day, without coming to harm
- To be used as guidelines for risk assessment and used by people qualified in occ health practice
- It is not recommended that untrained persons use WES to determine whether the risk is being adequately managed. Professional judgement is required in making decisions regarding safe levels of exposure to chemical and physical agents found in the workplace.



Exposure monitoring and application of WES

- Exposure levels are almost always variable even in work that is regular and consistent.
- Variability in exposure occurs due to variation in work activities, control methods and environmental conditions.
- **Due to this variability, exposure measured on a single day will not reflect exposure on other days – recall the slide on white spirits exposure on 60 consecutive workdays.**
- Even samples from multiple days may not reflect the true variation in exposure that may occur over the long term.
- Monitoring strategy must be designed to provide sufficient measurements to reflect the risk to the worker from the variation in exposure.
- Various methods are available to determine appropriate number of samples to account for variation. Professional experience and judgement needed.
- To account for variability, the AIHA suggests that 6-10 samples should be sufficient to give a picture of an exposure profile.

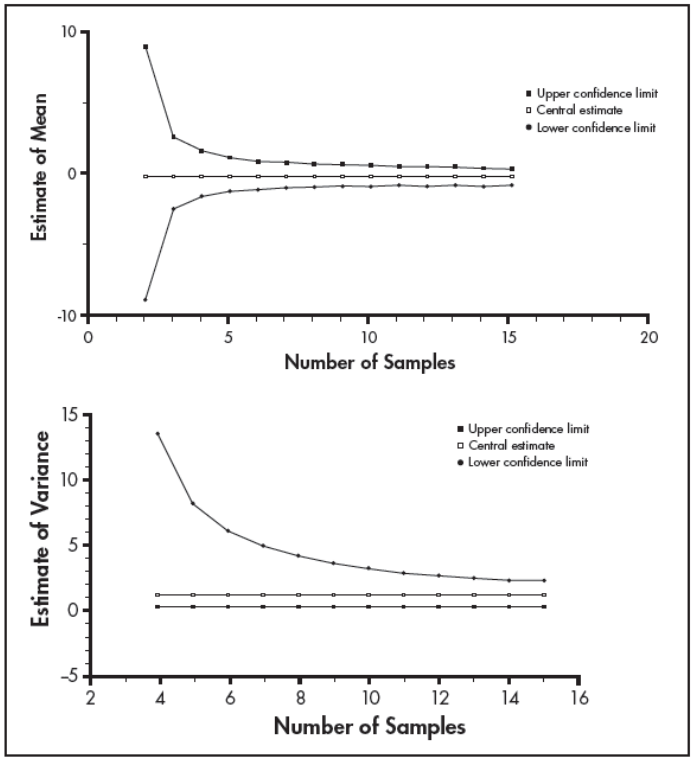
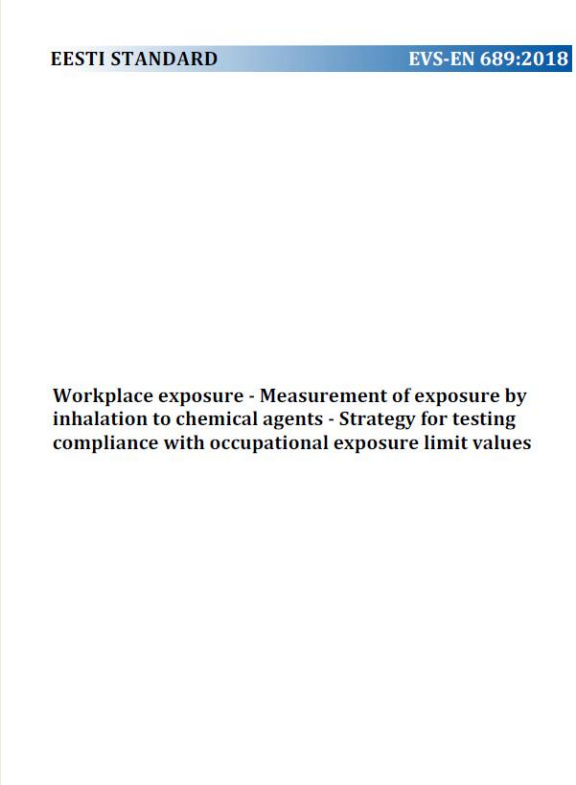


Figure 7.11 – Effect of sample size on estimating population mean and standard deviation.

Health Risk Assessment

- **Cannot determine from one sample**
- **Sampling must take account of variation in exposure**
- **Sampling must be personal sampling** (exposure experienced by a person)
- **Various methodologies e.g. European Standard 689 (2018)** – 'compliant' if <10% OEL from 3 samples, <15% OEL from 4 samples or <20% OEL from 5 samples. AND Non-compliant if 1 result >OEL. If something different, then additional monitoring required.
- Others: AIOH Occ Hygiene Monitoring and Compliance Strategies, NIOSH Occ Exposure Sampling Strategy Manual, IHStats from AIHA.


EESTI STANDARD EVS-EN 689:2018

Workplace exposure - Measurement of exposure by inhalation to chemical agents - Strategy for testing compliance with occupational exposure limit values

COMPETENCY & EXPOSURE MONITORING

1 Legal duties

2 Legal consequences

3 Competency in exposure monitoring

4 Exposure monitoring reports

LEGAL DUTIES of a PCBU

1. Is a consultancy company carrying out exposure monitoring a PCBU?
2. Is an individual HS consultant working as a self-employed person a PCBU?
3. Could the exposure monitoring work a consultant (PCBU) does put 'other persons' at risk?
4. What are the consequences of poor exposure monitoring, or interpretation of data?

LEGAL CONSEQUENCES

Section 47 - Offence of reckless conduct in respect of duty

If a PCBU fails in their primary duty of care, and

- **without reasonable excuse, engages in conduct that exposes any individual to whom that duty is owed to a risk of death or serious injury or serious illness; and**
- **is reckless as to the risk to an individual of death or serious injury or serious illness,**

Then they have committed an offence and are liable on conviction to:

- **imprisonment <5 years or a fine < $600,000, or both (for an individual who is a PCBU or an officer), or**

- **a fine < $3 million (for a consultancy business)**

LEGAL CONSEQUENCES

Section 48 - Offence of failing to comply with duty that exposes individual to risk of death or serious injury or serious illness

If a PCBU fails in their primary duty of care, and that failure exposes any individual to a risk of death or serious injury or serious illness,

Then they have committed an offence and are liable on conviction to:

- **a fine < $300,000 (for an individual who is a PCBU or an officer), or**
- **a fine < $1.5 million (for a consultancy business)**

LEGAL CONSEQUENCES

Section 49 - Offence of failing to comply with duty

If a PCBU fails in their primary duty of care

Then they have committed an offence and are liable on conviction,

- **a fine < $100,000 (for an individual who is a PCBU or an officer), or**
- **a fine < $500,000 (for a consultancy business)**

GRWM Reg 32 (1)(b) Duties relating to exposure monitoring

- **Exposure monitoring required by regulations must be carried out by or under the supervision of, a competent person who has sufficient knowledge, skills, and experience in the appropriate techniques and procedures, including the interpretation of results.**

- **The duty to ensure that happens lies with the PCBU with management or control of the workplace**

- **If the consultant is not competent, how are they to ensure they are not putting other persons at risk? (primary duty of care)**

- **If the PCBU of the workplace contravenes that requirement, they commit an offence and are liable on conviction to a fine of $10,000/$50,000.**

NOISE MONITORING

Health and Safety in Employment Regulations 1995

- a noise exposure level, $L_{Aeq,8h}$, of 85 dB(A); and
- a peak noise level, L_{peak}, of 140 dB, and
- L_{Aeq} must be normalised to 8 hours

NOISE MONITORING

- **Noise must be assessed in accordance with Australian Standard AS 1269–1989**
- **(* best practice says to use the current AS/NZS 1269: 2005, Occupational Noise Management standards)**

- **1269.0 Overview**
- **1269.1 Measurement and assessment of Noise Immission and Exposure**
- **1269.2 Noise control management**
- **1269.3 Hearing protector program**
- **1269.4 Audiometry assessment (2014)**
- **Competency requirements for noise monitoring in Appendix A of 1269.1:2005**

NOISE MONITORING

GRWM 32(1)(b) - Exposure monitoring required by regulations must be carried out by or under the supervision of, a competent person who has sufficient knowledge, skills, and experience in the appropriate techniques and procedures, including the interpretation of results.

- **Noise regulations require employer to ensure no one exposed above specified levels that require measurement to ascertain – in effect noise exposure monitoring is required by Regulations.**

- **If the PCBU of the workplace contravenes that requirement they commit an offence and are liable on conviction to a fine of $10,000/$50,000.**

NOISE MONITORING

Competency requirements 1269.1:2005

A thorough understanding of:

- **The objectives of the assessment**
- **The basic physics of sound**
- **The correct usage and limitations of sound measuring instruments**
- **The methods to determine occupational noise exposures**
- **How to record results and explain them**
- **The correct method for evaluating hearing protection**
- **The statutory requirements (the law)**
- **Basic understanding of the principals of engineering noise control and noise management**

COMPETENCY, HASANZ AND THE NZOHS

HASANZ

- **To be on the Register for occupational hygiene, consultant must be a full member of the NZOHS**
- **To be a full member of the NZOHS must:**
  - have a degree or diploma in science or equivalent (and provide academic record)
  - have 5 years experience and currently work in the field
  - demonstrate professional level* of hygiene work by providing 2 reports/surveys/papers/lectures
  - provide reference testifying to professional competence
  - sit an oral exam at Council's discretion to demonstrate satisfactory level of professional competence
  - maintain CPD points to keep MNZOHS

* Prof level – covering anticipation, recognition, evaluation and control aspects

WORKSAFE'S APPROACH WHEN CONSULTED

- **<u>In the past</u> we have directed callers to professional body websites**
- **Now we direct them to HASANZ**

WRH Reports and Limitations

DESCRIPTIVE INFORMATION & LIMITATIONS

WRH reports seen by Worksafe

Many lack adequate descriptive information

- **Business activity – what does the workplace actually do?**
- **Number of workers – knowledge informs sampling strategy**
- **Length of shifts – knowledge informs need for adjusted WES**
- **Job process or task**
- **How workers were selected for monitoring**
- **Existing controls**

Guidance on report writing:
NZOHS website https://nzohs.org.nz/wp-content/uploads/2019/01/NZOHS-Report-Writing-Guide-V1.pdf
AIOH website www.aioh.org.au/resources/aioh-library
Or BOHS website http://www.bohs.org/wp-content/uploads/BOHS-Guide-to-Report-Writing-Final-Version-18-December-2011.pdf

DESCRIPTIVE INFORMATION & LIMITATIONS

- **Why only 2 or 3 personal exposure measurements?**
- **No reference to any standards.**
- **Description of methodology is too short or lacking, e.g. only says "Noise measurements were performed according to ASNZS 1269.1:2005"**
- **No statistical analysis performed.**
- **No evaluation of risk, e.g. "Measured levels were below the NZ WES" and nothing more said. The reader is provided with no appreciation of what the risk to health is for workers.**
- **Inappropriate evaluation of risk, e.g. 2 samples were below the NZ WES and the report concluded "the risk to workers' health is low".**

WRH PROSECUTION

Prosecution June 2018 – guilty plea
Section 48 - Offence of failing to comply with duty that exposes individual to risk of serious illness*

Failures – not having

- Developed, documented, implemented and communicated an adequate safe system of work for worker exposure or potential exposure to substances hazardous to health;
- (ii) Provided and maintained a safe work environment that minimised the exposure of workers to substances hazardous to health;
- (iii) Adequately monitored the on-going health of workers to identify any changes in their health status due to exposure to substances hazardous to health

* Serious illness as determined by our HSMP

Consultant

? Failure under primary duty of care S36(2)

Getting you home healthy and safe.
That's what we're working for.

WORKSAFE
NEW ZEALAND | MAHI HAUMARU AOTEAROA