# Noise

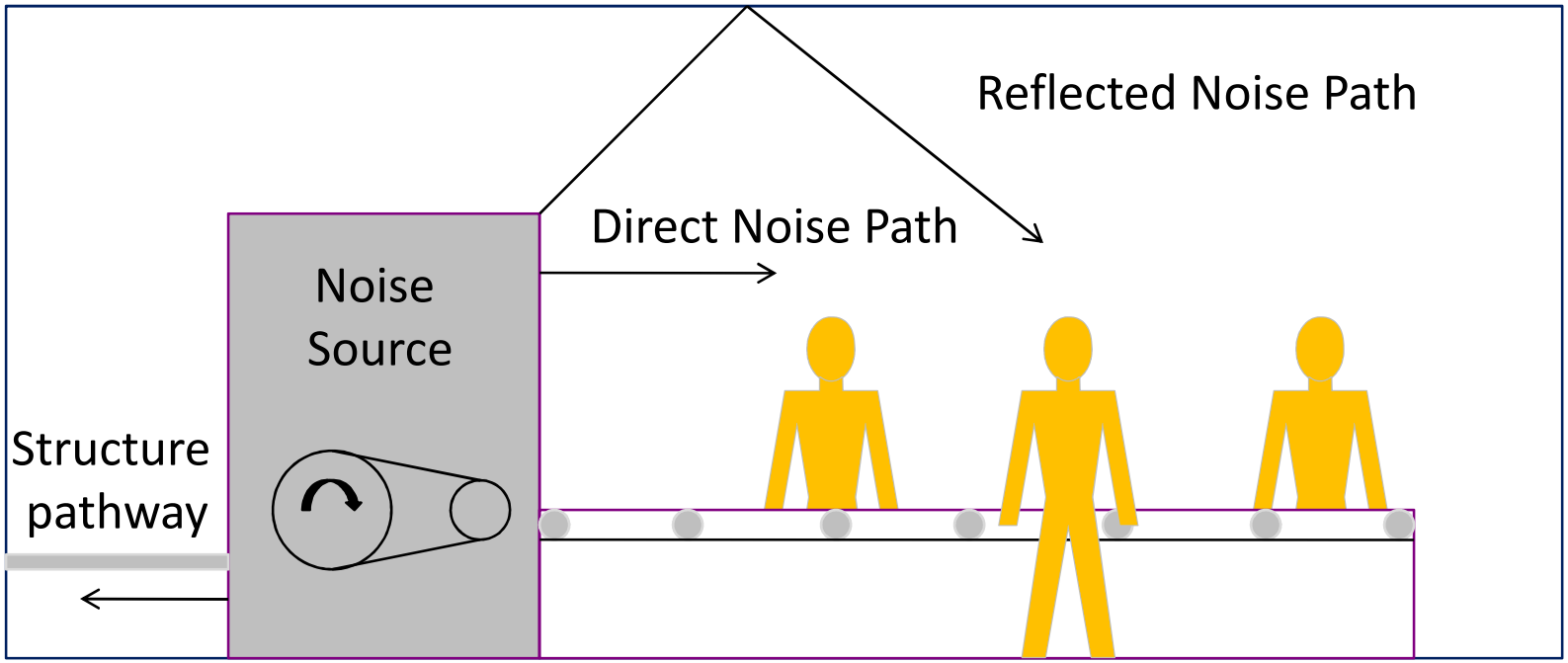
Health effects:

- Temporary:
  - reduction in hearing (Temporary threshold shift)
  - ringing in ears
  - Temporary tinnitus
- Permanent:
  - Permanent tinnitus
  - noise-induced hearing loss (Permanent threshold shift)
  - Physical damage to hearing mechanisms
- Stress
- Head ache

Safety issues:

- Inability to hear vehicles, warnings, conversations
- Concentration problems

# Noise Exposure Control

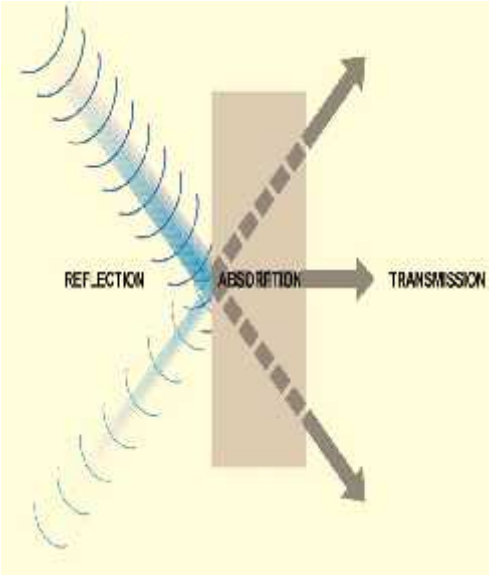



Noise: source, pathway, receiver

# Noise Exposure Control

**Source**: Design, maintenance/lubrication, reduce speed/energy

**Path**: location, enclosure, silencers, absorption, damping, isolation, lagging, screens

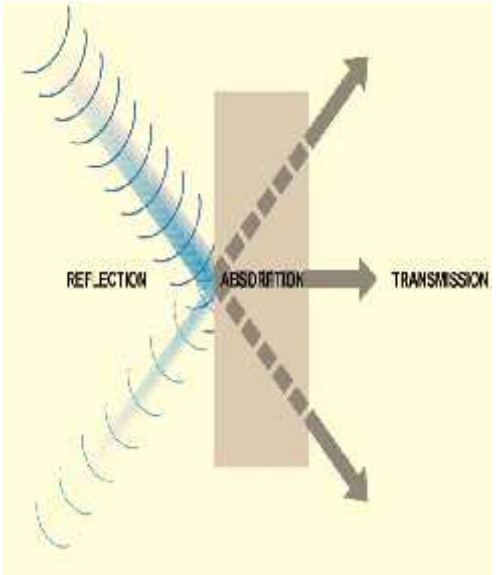



**Receiver**: ear protection, job rotation

# Noise Exposure Control

## Source:

- Tighten loose equipment
- Regular lubrication
- Eliminate unnecessary leaks
- Properly adjust machinery
- Padded containers for catching components
- Switch equipment off especially fans
- Use rubber or plastic bushes



# Noise Exposure Control

**Path**:

**Enclosure**

Surrounding the noise source with sound insulating material (care to be taken not to overheat machine)

**Silencers**

Reducing noise from exhaust pipes etc. using absorbent materials or baffles

**Absorption**

Surrounding/obstructing noise source with absorbent materials (e.g. foam)

**Damping**

Reduction in structure borne noise by the use of rubber/cork, springs etc.

**Isolation**

Protection of persons from sound source by distance or sound proofed rooms

# Noise Exposure Control

**Receiver:**

**Ear protection, Provision of Ear Plug and Ear Muff**

**Job rotation**

# Hearing Protection

Ear Defenders (muffs)

- Encase the ear and bones surrounding the ear

Ear plugs

- Fit into the ear canal

# Hearing Protection

## Ear defenders or muffs

| Advantages | Limitations |
|---|---|
| Easy to supervise and enforce use as visible | Uncomfortable |
| Less chance of ear infections | Efficiency affected by long hair, spectacles etc |
| Higher level of protection possible | Must inspected, cleaned and maintained |
| Can integrate with other PPE | |
| Reusable | |

# Hearing Protection

## Ear plugs

| Advantages | Limitations |
|---|---|
| Cheap and easy to use | Difficult to see when fitted, supervision and enforcement difficult |
| Disposable | Risk of infection if dirty or if cross-contaminated when inserted |
| More comfortable, range of designs | Need to be correctly sized for individual |
| Do not interfere with other PPE | Effectiveness decreases with usage |

# Effects of Exposure to Vibration

Hand-Arm Vibration Syndrome (HAVS)

- Vibration white finger (blanching)
- Nerve damage
- Muscle weakening
- Joint damage

- Whole-Body Vibration
- Damage to spinal discs
- Dizziness

*Typical vibration white finger*
*(Source: HSE Guidance)*
*(Reproduced under the terms of the Click-Use Licence)*

# Control of Vibration

Source:

- Eliminate
- Substitute
- Change work method
- Maintenance

Pathway:

- Isolate

Duration:

- Limit time exposed
- Job rotation

Person:

- PPE

# Radiation


Two types:

- Ionising
  - higher energy
  - can change the structure of atoms
- Non-ionising
  - lower energy
  - heating effects
  - does not change the structure of atoms

# Ionising Radiation

# Types of Ionising Radiation

Can penetrate the body and cause serious and permanent harm:

- Alpha particles
- Beta particles
- X-Rays
- Gamma rays
- Neutrons

# Health Effects

- Radiation sickness
- Nausea, vomiting and diarrhoea
- Blistering and ulceration of skin
- Hair loss
- Dermatitis
- Cataracts
- Anaemia
- Reduced immune system
- Infertility
- Cancer
- Genetic mutation
- Birth defects

**The larger the dose, the greater the risk**

# Protection from Ionising Radiation

**Time** Dose rate is directly proportional to exposure time

**Distance** Maintain safe distance

**Shielding** placing a physical barrier between the source and the individual

- Personal Protective Equipment
- Environmental and personal monitoring
- Training and supervision
- Good hygiene practices
- Correct disposal of radiation materials

# Non-Ionising Radiation

# Non-Ionising Radiation

| Types | Sources | Health Effects |
|---|---|---|
| Ultra-violet (UV) | Sunlight<br>Arc welding | Skin burns<br>Arc eye (photokeratitis)<br>Skin cancer |
| Visible light | lasers | Temporary blindness |
| Infra-red (IR) | Red hot steel<br>Glass manufacture | Redness and skin burns, retinal burns, cataracts |
| Microwaves | Food preparation<br>Telecommunications | Internal heating<br>Organ damage |
| Radiowaves | Radio, TV<br>radar | Internal heating<br>Organ damage |

Arc Eye

# Protection from Non-Ionising Radiation

- Shielding
- Distance between source and person
- Reducing duration of exposure
- Personal protective equipment
- Protective creams

# Stress

Stress is:

- An adverse reaction to excessive pressure
- Health effects:
  - psychological
  - physical
  - behavioural
  - serious ill-health if prolonged

# Causes of Stress

- Change - uncertainty
- Demands - excessive
- Control - weak
- Support - poor
- Relationship - difficult
- Role - undefined

# Effects of Stress

## Psychological

- Anxiety
- Low self-esteem
- Depression

## Physical

- Sweating
- Heart rate
- Blood pressure
- Skin rashes
- Muscle tension
- Headache
- Dizziness

## Behavioural

- Sleeplessness
- Poor concentration
- Poor decision-making
- Mood swings
- Irritability
- Alcohol consumption
- Drug misuse
- Absence from work

# Prevention Strategies for Stress

- Demand - reasonable demands, sufficient resources
- Control - given as much control as possible
- Support - information, instruction, training, additional support
- Relationships - clear anti-harassment and bullying policies
- Role - clear job descriptions, responsibilities and authority
- Change - planning and preparation for change, communication, timescales

# Violence

Work-related Violence:

Any incident in which a person is abused, threatened or assaulted in circumstances relating to their work

# Risk Factors for Violence

- Cash handling
- Lone working
- Representing authority
- Wearing a uniform
- Dealing with people under stress
- Dealing with people under the influence of alcohol or drugs
- Censuring or saying "no"

# Occupations at Risk

Not an exhaustive list!!

- Hospital A&E staff
- Police
- Social workers
- Bus and taxi drivers
- Firefighters and paramedics
- Traffic wardens
- Railway staff
- Estate agents

# Control Measures

1) Queue management and information
2) Less face to face contact
3) Use “cashless systems”
4) Employee survey
5) Avoid lone working in high risk areas
6) Call in systems for lone workers
7) Arrangements for Staff working late
8) Employee training
9) Change public waiting areas
10) Provide staff with escape routes
11) Video Cameras, alarms, visible security
12) Protective screens/security codes
13) Wider counters/higher floor staff side