Health and Safety
Executive

HSE

EU Vibration and Noise Directives - Implications

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Noise & Vibration

Health and Safety
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Controlling Hand-arm Vibration (HAV) at work

HSE guidance and expectations

Hand-arm Vibration Syndrome (HAVS)

- White finger and gangrene
- Clumsiness
- Crooked fingers and weak muscles

- PREVENTABLE

Exposure criteria

- Exposure Action Value (EAV) **2.5 m/s^2 *A*(8)**
  - lower than the old HSE recommended action level
  - but still not a “safe” level of exposure

- Exposure Limit Value (ELV) **5 m/s^2 *A*(8)**
  - higher than the old HSE recommended action level
  - a difficult challenge in some jobs (e.g. masons)
  - should prevent the worst exposures
  - transitional arrangements until 2010, but only where not reasonably practicable to comply

Rules of thumb – using good tools

- Rotary tools
  - EAV exceeded within 1 hour
  - ELV exceeded within 4 hours
    - Some older tools exceed ELV within 1 hour
- Percussive tools
  - EAV exceeded within ¼ hour
  - ELV exceeded within 1 hour
    - Some older tools exceed ELV within 2 or 3 minutes

- Note: These are ‘trigger times’

Managing HAV risk

- Change the process
  - eliminating or reducing vibration exposure at source;
  - often essential where exposures are very high.
- Select suitable (reduced-vibration) equipment
  - purchasing policies
- Operator training
- Maintenance of equipment
- Time limits, job rotation
  - Consider exposure points system
- Health surveillance

Health surveillance

- Required when the EAV is likely to be exceeded
  - or where risk assessment shows the need
  - Should prevent progression …..
- Important for HAVS because:
  - Some high exposures are unavoidable;
  - there is no effective personal protective equipment

HSE's guidance on HAV

- New employees' pocket card
- New employers' leaflet
- New Handbook:

  Hand-arm vibration: Control of Vibration at Work Regulations 2005. Guidance on Regulations (L140)

- Plus existing video and case studies book

HAV – Implications for quarries

- Not a huge problem except, for example:
  - Hand drilling
  - Stone masons shops
- Maintenance crews may be at risk
  - Some risk from engineering activities
  - Powered hand tools
    - Nut runners, Grinders, Etc.

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Controlling Noise at Work

HSE guidance and expectations

Effects of noise exposure

- Hearing loss
- Tinnitus
- Other hearing problems (e.g. localisation of sounds)
- Safety risks
  - warning signals
  - essential communications

New Action & Limit Values
for daily exposure and peak noise

- Lower Exposure Action Values
  - $L_{EP,d}$ of 80 dB, L_{Cpeak} of 135 dB
- Upper Exposure Action Values
  - $L_{EP,d}$ of 85 dB, L_{Cpeak} of 137 dB
- Exposure Limit Values
  - $L_{EP,d}$ of 87 dB, L_{Cpeak} of 140 dB
    - Can take account of hearing protection

Our Challenge

Away from…

- Noise assessment as the end point
- Excessive quantification of exposure
- Reliance on hearing protection

Towards

- Control of noise risks
- Managed through risk assessment and prioritised action plans

With

- New ‘tools’ and guidance to encourage rapid risk identification and decision making

Managing noise risk

- **Investigate** and **implement** good practice and industry standards for control of noise
- **Minimise** risks (sfairp) for all employees
- Ensure **legal limits** are **not exceeded**
- Use **ear protection** to control residual risks
- Provide **information, instruction and training**
  - get workers and their representatives involved
- Use **health surveillance** to ensure control measures are preventing hearing damage

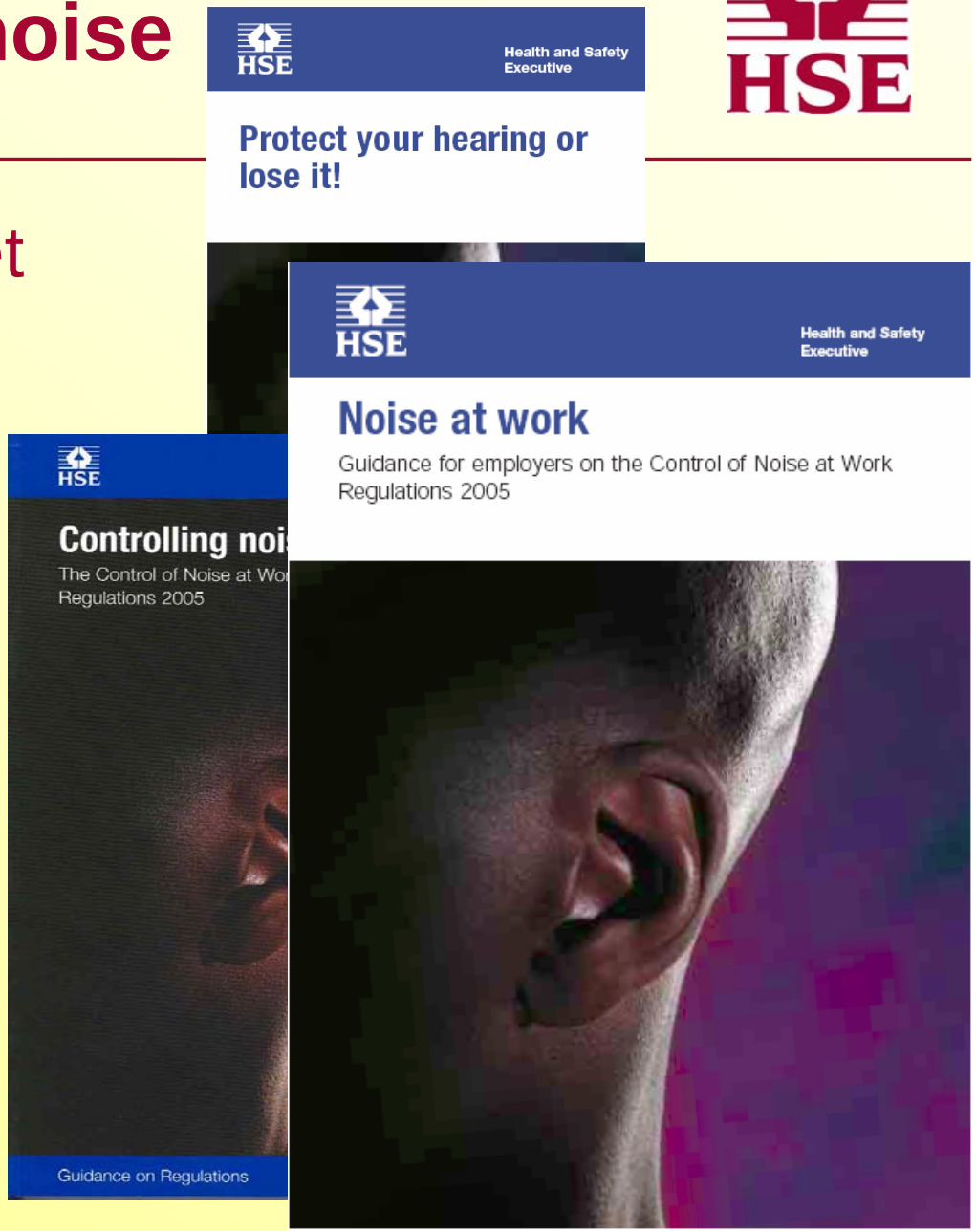
Noise Control - Examples

- Problem: Internal cab noise of 95 dB. Vehicles have long working life.
- Solution: Damping pads to resonant surfaces, sound barrier mat to floor and engine bulkhead, line cab with absorptive foam
- Result: 11 dB reduction
  - Below 85 dB
  - Above 80 dB

HSE's guidance on noise

- New employees' pocket card
- New employers' leaflet
- New Handbook:

  Controlling noise at work: Control of Noise at Work Regulations 2005. Guidance on Regulations (L108)



Noise - Implications for quarries

- Identify people covered by new lower 80dB action level
  - Operators of mobile machinery
- Additional engineering noise control at workstations in mobile and static plant
- More mandatory use of ear protection
  - Wider availability of ear protection > 80 dB
  - Operators of mobile machinery > 85 dB
- More rigorous health surveillance (audiometry)
- Comply with 87dB and peak 140dB limits
  - Using ear protection as necessary

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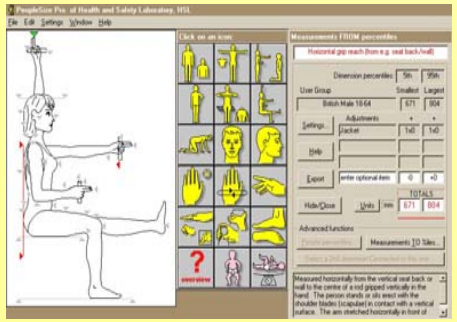
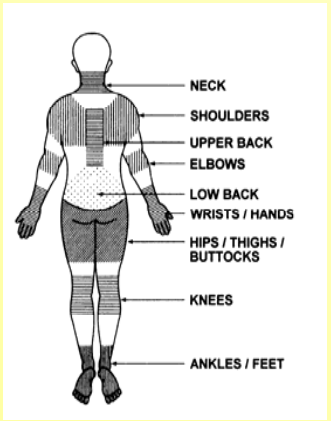
Controlling Whole-body Vibration (WBV) at work

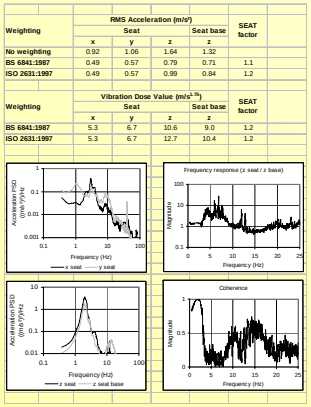
HSE guidance and expectations

An holistic approach to back pain

- WBV is not the only source of back pain
- Check sources and prioritise controls
  - Is WBV aggravating existing back injuries?
  - Assess posture, access or sitting for long periods
  - Assess manual handling of loads
  - Monitor health and analyse for trends and source







Weighting	RMS Acceleration (m/s^2) Seat x	Seat y	Seat z	Seat base z	SEAT factor
No weighting	0.92	1.06	1.64	1.32	
BS 6841:1987	0.49	0.57	0.79	0.71	1.1
ISO 2631:1997	0.49	0.57	0.99	0.84	1.2

Weighting	Vibration Dose Value ($m/s^{1.75}$) Seat x	Seat y	Seat z	Seat base z	SEAT factor
BS 6841:1987	5.3	6.7	10.6	9.0	1.2
ISO 2631:1997	5.3	6.7	12.7	10.4	1.2

Exposure criteria for WBV

- Exposure Action Value (EAV): **0.5 m/s^2 *A*(8)**
  - many vehicle/mobile machinery users will need to consider WBV, but actions will often be simple good practice
- Exposure Limit Value (ELV): **1.15 m/s^2 *A*(8)**
  - An issue for *some* activities in quarrying
  - Transitional period for ELV to 2010 if not currently reasonably practicable to comply
- Guidance criterion for risk: **17 m/s$^{1.75}$**
  - International consensus on clear risk from WBV

WBV in Quarries

- Exposure > EAV likely for quarry machinery
- Exposure > ELV for poor practice
  - virtually all quarry machinery
- Exposures < ELV with skilled operators
- Exposures > ELV seem rare in practice
    - but dozer ripping can be at ELV with good practice
- ISO/PD TR 25398 covers quarry machinery
  - National body enquiry closed 8 Mar 06

Information Sheet – WBV in quarries

- WBV emission and exposure data collected for quarry machinery
- Split into 4 categories:
  - Precautionary measures advisory
    - Exposure < EAV **and** shocks not significant.
    - Voluntary low cost control measures.
  - Precautionary measures mandatory
    - Exposure > EAV **but** shocks not significant.
    - Low cost control measures reasonably practicable.
  - Control measures essential
    - Exposures greatly above EAV **and/or** shocks significant.
    - VDV > 17 $m/s^{1.75}$ – Risk of WBV/shocks causing back pain.
  - Restriction of exposure mandatory
    - Exposure duration limitation to assure compliance with ELV

Information Sheet – WBV in quarries

- Precautionary measures advisory
  - Static rock crushers; Drilling rigs
- Precautionary measures mandatory
  - Excavators > 25 t; Road haulage vehicles, e.g. 8 wheeled tipper trucks; Mobile crushers
- Control measures essential
  - Excavators < 25 t; Rigid Dumpers; Wheeled loaders (stock or face); Telescopic handlers; Articulated Dumpers; Graders
- Restriction of exposure mandatory
  - Dozers – especially ripping; Articulated Dumpers on uneven surfaces; Scrapers

HSE's guidance on WBV

- Employees' pocket card
- Employers' leaflet for
- Guidance on the Regulations and WBV (L141)

- Industry specific guidance for high exposure work
  - Quarries Information Sheet

WBV – Implications for quarries

- Operators trained in risks and controls
- (Suspension) seat in good condition
  - Defective/insufficient dampers cause shock
    - Replace several times during seat's life
  - Seats replaced several times in life of machine
- Ground condition adequate for machinery using it
  - Regular grading
- Modify speed and route to avoid excessive WBV

For more information

www.hse.gov.uk/vibration

www.hse.gov.uk/noise

Thank you