Update on research into HAV, WBV, and Noise in forestry and arboriculture

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Hand-arm vibration syndrome (HAVS)

- Disrupted blood circulation (VWF)
  - Fingertips can develop gangrene if exposure continues
- Neurological damage
  - Clumsiness
- Bone and joint disorders
  - Fingers no longer straighten
  - Muscles weaken
The new Vibration Regulations - employers’ duties

- Ensure health and safety of employees
- Risk assessment
- A hierarchy of measures to achieve control
- Information, instruction and training for employees
- Health surveillance
- Already expected for HAV since 1994, under general H&S legislation and HSE guidance on HAV (HSG88, 1994)
What’s new?

• Exposure Action Value (EAV) $2.5 \text{ m/s}^2 \ A(8)$
  – lower than the old HSE recommended action level
  – but still not a “safe” level of exposure
    • Good chainsaws reach the EAV after 2 hrs trigger time
      – Some chainsaws reach the EAV in less than $\frac{1}{2}$ hr

• Exposure Limit Value (ELV) $5 \text{ m/s}^2 \ A(8)$
  – higher than the old HSE recommended action level
    • Good chainsaws reach the ELV after 8 hrs trigger time
      – Some chainsaws reach ELV in less than 2 $\frac{1}{2}$ hrs
Control of exposure

• 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
  – exposure points system may help
“Traffic lights” system – a warning

- Some tool suppliers and hirers have established a three colour system of tool classification:
  - **Green: use up to 8 hours** (before ELV likely to be exceeded)
  - **Amber: use up to 2 hours** (before ELV likely to be exceeded)
  - **Red: refer to supervisor**

- Construction industry enthusiastic

- HSE currently working with industry to improve quality of vibration data and accompanying guidance
Health surveillance

• Required when the EAV is likely to be exceeded
  – or where risk assessment shows the need

• Important for HAVS because:
  – Some high exposures are unavoidable;
  – there is no effective personal protective equipment

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HSE’s guidance

- New employees’ pocket card
- New employers’ leaflet
- Plus existing video and case studies book

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Knowledge of HAV risks in forestry

• Current position summarised in FTN June 2005
  – Adequate basis for information sheet?
  – Need for research?

• Manufacturers’ emission data
  – ISO/DTR 22521 not yet available

• Actual vibration emissions and likely exposures not well known
  – Improved knowledge of exposure unlikely to change approach to control
Any questions on hand-arm vibration?
Control of Vibration at Work Regulations 2005: Exposure action and limit values for whole-body vibration

• Exposure Action Value (EAV): 0.5 m/s² 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/s² A(8)
  – challenge for some activities in some industries

• Transitional period for ELV to 2010 (2014 for agriculture & forestry) if not currently reasonably practicable to comply
Back pain in drivers

- Many possible causes of back pain in drivers:
  - Poor design or adjustment of seating or controls
  - Poor driver posture
  - Long periods in seat
  - Manual handling of loads
  - Awkward access to/jumping from cab
  - WBV, especially shocks & jolts
  - Non-occupational causes
Information on risks from WBV

• Manufacturers’ information
  – Warning of WBV risk
  – Emission data: main purpose is to warn of risk and estimate workplace exposures
    • WBV differences between directly competing machines are usually small

• Forestry Industry/HSE information sheet:
  – Summary of good practice
    • Discussion of research findings expected Jan 06
    • Summary article to appear in FTN Dec 2005
Straightforward risk control actions

• Driver behaviour:
  – slower, different route, avoiding rough ground, driving time limit;
  – driver skill, training, suspension seat adjustment

• A more suitable vehicle:
  – machine more suited to the terrain and task;
  – suitable seat and ergonomics of cab

• Maintenance:
  – machinery, tyre pressures, suspensions, seats;
  – roadways/operating surfaces

Note: Selection and maintenance of seats often poor
HSE guidance on WBV

• Leaflet for employers
• Pocket card for employees
• Guidance on the Regulations and WBV
  – to be published late 2005
• Industry specific guidance for high exposure work
  – under development
WBV in forestry

- Study of a small sample of machinery
  - Exposures usually above EAV but below ELV
  - But beware risk from shocks
    - Vibration Dose Value of $17 \text{ m/s}^{1.75}$ provides a guide
- Ergonomics likely a bigger factor for back pain
- Industry working with HSE to produce guidance on good practice control of WBV exposures
- Employers’ action on WBV in proportion with control of other causes of back pain
3 Forwarders

• Exposure: 0.4 – 0.7 m/s² A(8) or 8 – 12 VDV
  • Magnitude: 0.4 – 0.7 m/s². Duration: 8 hrs TBC
1 Harvester (excavator conversion)

- Exposure: 0.4 – 1.0 m/s² A(8) or 13 – 18 VDV
- Magnitude: 0.4 – 1.0 m/s². Duration: 8 hrs TBC
5 Harvesters (bespoke)

- Exposure: 0.4 – 1.2 m/s² A(8) or 10 – 23 VDV
- Magnitude: 0.4 – 1.2 m/s². Duration: 8 hrs TBC
1 Chipper

- Exposure: 0.5 – 0.6 m/s² A(8) or 9 – 11 VDV
  - Magnitude: 0.5 – 0.6 m/s². Duration: 8 hrs TBC
1 Excavator

- Exposure: 0.7 – 1.0 m/s² A(8) or 20 – 30 VDV
  - Magnitude: 0.7 – 1.0 m/s². Duration: 8 hrs TBC
Any questions on whole-body vibration?

www.hse.gov.uk/vibration
New Noise Regs – new guidance

What is the problem with noise?
噪声是日常生活中常见的问题，它可能对人的听力和身体健康造成影响。了解噪声的来源和危害，有助于采取措施减少噪声。

What do I have to look out for?
检查噪声原因，寻找可能的解决方案。以下是一些常见的噪声来源和可能的控制措施。

- Noise generated by machinery, vehicles, and construction activities.
- Noise caused by loud music, TV, or other electronic devices.
- Noise generated by traffic, trains, or airplanes.
- Noise from construction sites or industrial plants.

- Use earplugs or other hearing protection devices.
- Control noise at the source by using quieter equipment or changing work practices.
- Improve ventilation to reduce noise levels.
- Provide noise reduction training for employees.

- Regular noise monitoring to assess effectiveness of control measures.
- Ensure noise levels are within the legal limits.
- Consider alternative work methods or locations.

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New Regulations, new emphasis

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 HSE guidance to encourage rapid risk identification and decision making
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
Control of risks and exposure

• General duty under regulations to reduce risks to the lowest level reasonably practicable

• Aim for noise control by technical and organisational means

• Apply good practice, industry standards, known solutions (regardless of exposure, but so far as is reasonably practicable)
Ear protection

• Reliance on hearing protectors, when above 85 dB, acceptable only;
  – For residual risk when all reasonable measures to reduce noise exposures have been put in place
    • Likely the case for powered hand-tools in forestry
  – To deal with the immediate risks, until such time as programme of control measures has been developed and put in to place.

• Hearing protectors to reduce the noise at the ear (beneath ear protectors) to below 87 dB
  • Demanding, e.g. for chainsaws at ~ 100 dB

• Ear protection must be available at 80 dB
Planned noise research in forestry

• Noise emissions/exposures for mobile and handheld machinery used in forestry are high but not well quantified
  – Improved knowledge of exposure unlikely to change approaches to control
  – Need for research?

• Summary planned for FTN Mar 06

• Study of noise from chippers
  – Funding agreed in principle
  – Tender in draft
Thank you for listening

Any questions on noise
www.hse.gov.uk/vibration
www.hse.gov.uk/noise