Edinburgh Napier University

Control of Vibration at Work Policy

Control of Vibration at Work Policy	**Date of Issue: May 2015**
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Policy Statement

The policy of Edinburgh Napier University is to provide and maintain safe and healthy working conditions, equipment and systems of work for all staff, students and others, and to provide such resources, information, training and supervision as needed for this purpose.

The University will provide resources and maintain appropriate management systems, systems of work and equipment to ensure that Hand Arm Vibration (HAVs) risks to all staff, students and others are controlled. Suitable information, instruction, training and supervision will be provided to all those involved in the Control of Vibration at Work.

The University will adopt the principles of control as set out in the Control of Vibration at Work Regulations (CVWR) 2005. Other publications, including those detailed in Section 6, will also be used to source best practice guidance where appropriate.

The management of Hand Arm Vibration risk will be a continual commitment by the University and will involve regular monitoring and progress meetings, a risk assessment programme, monitoring, inspection and record keeping.

This policy is formally accepted by the University.

The University will do all that is reasonably practicable to comply with its requirements, and will make the necessary resource available.

Signed

CONTENTS

Control of Vibration at Work

Policy on Hand-Arm Vibration Syndrome (HAVS)

1.0 Executive Summary

General health and safety regulations have required employers to control the risks to employees from vibration since the early 1990's. The Control of Vibration at Work Regulations (CVWR) 2005 came in to force on the 6th July 2005 and now place specific duties on employers such as the University to manage those risks.

The CVWR's require the University to assess the risks from vibrating equipment, machinery and vehicles provided at work and eliminate or reduce these risks to as low a level as is reasonably practicable. The primary aim is to protect staff and other people who may be put at risk (i.e. students) from the ill health effects of vibration.

The regulations make provision for the control of Hand Arm Vibration (HAV) and set daily exposure limits and action level values for vibration exposure.

Since it is Edinburgh Napier University's policy to comply fully with such duties, Facilities Services must ensure that the requirements of the Regulations are discharged, and that the policy on PPE is incorporated into its local safety statements. Individual staff who organize, arrange or lead such work must acquaint themselves with, and act upon, the requirements of the local safety statement in force in their department. The effectiveness of these arrangements will be monitored periodically by the Director of Facilities Services

2.0 Introduction and Purpose

Hand-Arm Vibration Syndrome or HAVS is a condition that has the potential to affect any worker who uses powered hand-held or hand-guided tools as a major part of their job.

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The primary cause of HAVS is work involving holding vibrating tools or workpieces. The risk depends on the magnitude of the vibration and how long an individual is exposed to it. Other aspects that can have an affect are the grip, push and other forces used to guide and apply vibrating tools or workpieces, the pattern of exposure, how much of the hand is exposed to the vibration, temperature, and individual susceptibility.

This document is most likely to be relevant to the University Maintenance and Grounds Departments. Generally, it is anticipated that the level of risk is not high because of the nature of the work taking place i.e. vibration exposure is not prolonged and is frequently interrupted .and occasional exposure is unlikely to cause ill health

2.1 Hazards and Legislation

Workers whose hands are regularly exposed to high vibration may suffer from several kinds of effects to the hands and arm, including impaired blood circulation and damage to the nerves and muscles. It is felt as a tingling or numbness in the fingers or where finger blanching occurs. There are other names for the condition: 'vibration white finger', 'dead finger' and Secondary Raynaud's Syndrome.

The affects are cumulative and as time passes the attacks may involve considerable pain and loss of manual dexterity, resulting in clumsiness and reduced grip strength. In severe cases, blood circulation may be permanently impaired and fingers may take on a blue-black appearance.

The Control of Vibration at Work Regulations 2005 (the Vibration Regulations), came into force on 6 July 2005 and aim to protect workers from risks to health from vibration.

The regulations introduce action and limit values for hand-arm and whole-body vibration.

2.2 Potential sources of high vibration at the University

The following is an indicative list of the types of equipment found in the University that may present a vibration hazard:

- Grounds work, e.g. chainsaws, strimmers, mowers, ride on mowers, tractors, blowers, hedge trimmers, etc.
- Maintenance equipment, e.g. grinding tools, rotary burring tools, powered hammers, nail guns, concrete breakers, sharpening equipment, sanders and drills
- Grinders and other rotary tools
- Timber and wood machining tools
- Percussive metal-working tools
- Percussive tools used in stone working, quarrying, construction

2.3 Exposure Limits

The Regulations define two types of exposure limit.

The **Exposure Action Value** (EAV) is the level of daily exposure to vibration, which if exceeded requires certain actions to reduce exposure.

The **Exposure Limit Value** (ELV) is the maximum amount of vibration an employee may be exposed to on any single day.

The vibration level produced by equipment is usually assessed by measuring the acceleration level in m/s^2. The Regulations set an Exposure Action Value (EAV) of $2.5m/s^2$ over 8 hours (A8) and an Exposure Limit Value (ELV) of $5m/s^2$ over 8 hours (A8).

It is the aim of the University to minimise the risk of HAVS to staff by keeping exposure to vibration as low as is reasonably practicable and where the 2.5m/s^2 is exceeded, control measures will be put in place to reduce it.

The vibration dose received by the worker over a typical working day depends on the duration of exposure as well as the vibration magnitude.

To allow different exposure patterns to be compared they are adjusted or normalised to a standard reference period of 8 hours, similar to the approach taken for noise levels. The Control of Vibration at Work Regulations 2005 describes how an exposure normalised to 8 hours, A(8), can be calculated. The table below gives the average vibration levels over a working day and the times to reach the exposure levels.

Vibration Magnitude (m/s^2)	2.5	3.5	5	7	10	14	20
Time to reach Exposure Action Value (in hrs)	8	4	2	1	½	¼	8 mins
Time to reach Exposure Limit Value (in hrs)	>24	16	8	4	2	1	½

Exposure Action Value = 2.5m/s^2 per 8hr working day
Exposure Limit Value = 5m/s^2 per 8hr working day
The following table lists some indicative vibration levels for typical equipment.

Examples of Equipment	Typical Vibration Levels (in m/s^2)
Hedge cutter	6.3
Flymo mower	3.0
Chainsaw	3.5-5.5
Blower (hand-held)	7.5
Kango hammer	4-15 (depending on power/size)

For example, a hand held blower with a vibration level of 7 m/s2 would result in exposure of the operator to the equivalent of the EAV in just one hour, hence typical use greater than this would require reasonably practicable exposure reduction measures to be taken. If this was used for 4 hours a day the ELV would be exceeded and no further use would be permitted.

Generally at the University, the nature of the work lessens the risk. For instance, work may be seasonal or related to particular projects; exposure is normally not prolonged on a regular basis. University maintenance equipment tend not to be operated in the same way as industrial environments so individuals are not continuously carrying out repetitive high-vibration tasks on a daily basis. There is still a need to assess each situation.

However, the diversity of work that an individual may be involved in can cause difficulty in accurately assessing exposure because a number of different tools are being used in any one day for variable lengths of time. It should be possible to estimate a cumulative exposure by summing up the typical exposure pattern from the range of equipment used.

"However, if the only information available to you is the vibration emission declared in the equipment's handbook, it may be safer to double this figure before using it for estimating daily exposures." - Due to the implementation (29/12/2009) of the Supply of Machinery (Safety) Regulations 2008, supplementary European Standards have been revised to help manufacturers provide information that can be used to estimate daily HAV exposure

2.4 Whole Body Vibration

There is also a risk of whole body vibration that can affect those who work with vibrating equipment they need to stand or sit on, e.g. tractors, ride on mowers and other mobile machinery. The assessment is similar to that for HAVS in that identification of a significant risk should lead to control measures such as equipment modification/maintenance, minimising length of exposure and providing information to staff.

2.4.1The exposure limit

The regulations introduce action and limit values for hand-arm and whole-body vibration.

The regulations introduce an:

- Exposure action value of 0.5m/s^2 A(8) at which level employers should introduce technical and organisational measures to reduce exposure.

- Exposure limit value of 1.15/ms^2 A(8) which should not be exceeded

The University should not consider reduction below the exposure limit value to be a target – you must reduce exposure as low as you reasonably can. This may mean reducing the time for which the employee uses the machine each day, e.g. spreading that particular task over several days or sharing it between two or more employees (job rotation).

2.4.2 Occasional exposures above the exposure limit value (weekly averaging of exposure)

On very limited occasions, employers are allowed to average exposures over a week rather than over a day, but only in particular circumstances. This is primarily designed for where workers exceptionally need to carry out work causing uncommonly high vibration exposure in a single day, e.g. for emergency work. The main conditions are:

- that the person's exposure is usually below the exposure action value;

- that the risk is less than if the employee were exposed at the exposure limit value for the week.

This flexibility does not remove the duty on the employer to reduce the exposure so far as is reasonably practicable.

2.4.3 Employees whose health is likely to be particularly at risk

Extra care will be needed to ensure that the exposure of those who are particularly sensitive to WBV is kept to a minimum, that they are given and take account of adequate information, instruction and training, and that symptoms of back pain are monitored.

3.0 Roles and Responsibilities

3.1 Duties of Employers - (at any exposure level)

- Assess vibration risks to health and safety
- Eliminate vibration risk at source, or manage the risk and reduce to lowest reasonably practicable level
- Provided information and training for employees on vibration risks and control measures
- If replacing machinery or tools, replace where possible with ones that have built in safety measures to reduce exposure to vibration.

If the Exposure Action Value (EAV) 2.5m/s2 is likely to be exceeded

- Reduce exposure to the lowest practicable level
- Provide health surveillance (this is available through Occupational Health)

The Exposure Limit Value (ELV) 5m/s2

- Ensure employees are not exposed above the ELV
- If they are, take immediate action to prevent recurrence

3.2 Responsibility for Risk Assessment and Risk Reduction

It is the responsibility of Schools and Departments to identify activities where the hazard of HAVS is a problem and include it in risk assessments. Ways to establish whether there is a problem and how to reduce it are as follows:

To identify the extent of the problem:

a) Identify the equipment that vibrates and find out about the levels of vibration - information should be available from suppliers/manufacturers (they have a duty to supply it). Staff are likely to have a subjective opinion from using the equipment. Consider vibration monitoring (see below).
b) Rank equipment in terms of hazard contribution, i.e. the level of vibration and how much they are used.
c) Discuss with staff whether they have noticed any particular problems with certain types of equipment or individual machines.
d) Check the workload of individuals who use vibration tools and at least estimate the exposure they may be receiving.

To reduce the risk:

It is essential that Risk Assessments are undertaken and reviewed regularly.

a) Check whether it is necessary to use the current types of tool or whether a task may be achieved a different way.
b) Minimise the need for operations and tools that expose workers to hazardous vibration.
c) Minimise the forces needed to control tools.
d) Consider the maintenance of the equipment and whether there is likely to be deterioration in anti-vibration mountings, etc. Ageing and/or poorly maintained equipment is likely to give worse levels of vibration.
e) Reduce exposure times, e.g. by breaking up activities to minimise prolonged exposure.
f) It is important that operators are able to maintain good blood circulation, gloves can be helpful although alone, they are not the solution to a vibration problem.
g) Heated handles, warm, weatherproof clothing; heating pads are amongst the other aids that can be considered.
h) Further suggestions on how risk reduction may be achieved are given in the publications listed on page 4.

4.0 Control Methodology

4.1 Purchasing of new equipment

Whenever new equipment is to be purchased, the supplier's vibration information should be checked in advance and every effort made to ensure that equipment with the lowest vibration levels and best protection is obtained. Any second-hand equipment should also be assessed before being put into use.

4.2 Training

Members of a School/Department at risk of HAVS must be provided with adequate information. This should include the following:

- Information on vibration levels relevant to the machinery they are to use, particularly identifying pieces of equipment that are known to have higher vibration levels.
- The need to interrupt work using vibrating machinery on a regular basis with other tasks and or to divide such work with other colleagues,
- To be aware of other factors that can increase the likelihood of HAVS such as low temperature, smoking.
- Who to report problems to.

There is an HSE leaflet on HAVS which is a good general information source for employees. Download HSE's free pocket card Hand-arm vibration - Advice for employees (INDG296 - rev1) . This publication contains notes on good practice..

4.3 Health Surveillance

If there is a significant risk of HAVS, i.e. where an individual's vibration exposure exceeds 2.5m/s^2, then a health surveillance programme via the University's Occupational Health provider must be arranged using a suitably trained/qualified resource. The aim of this is to identify at an early stage any member of staff who may be showing medical signs of developing HAVS. If at any time between the routine checks, a member of staff notices any of the signs of HAVS, they should report it to their line manager in order that referral to Occupational Health can be organised and investigation of the equipment carried out.

4.4 Maintenance of Equipment

In order to minimise the deterioration of equipment, items should be inspected and serviced on a regular basis. Advice from the suppliers/manufacturers should be taken into account. There may be certain routine checks that lead to early identification of problems or accessory replacements, in which case these should be carried out at a set frequency.

Individual users must be made aware that if at any point they feel a machine performance has deteriorated in terms of vibration, they must report it at the earliest opportunity so that further investigations can be made.

4.5 Vibration Monitoring of Existing Equipment

It is possible to monitor vibration levels of equipment. For reliable results please contact the Health and Safety Office for further information.

Guideline measurements can be taken by hiring in monitoring equipment and taking advice from local experts on its use. The use of the equipment is not particularly straightforward therefore the results should be taken as rough estimates only.

The results of monitoring can be compared with the manufacturer's information and this might show the effect of age or poor maintenance or that there is something wrong with a particular item of equipment. The method of monitoring should be carried out in line with the strategy given in “Hand-arm vibration: Control of Vibration at Work Regulations 2005 (L140) (ISBN 0 7176 6125 3) replaces "Hand-arm Vibration (HSG 88).”

The results can be used in conjunction with estimates of time spent using each type of tool. This will give an approximate exposure.

4.6 Equipment with high levels of vibration

If it is found that there are items of equipment with high vibration levels (greatly exceeding 2.5m/s2), action is required to reduce this. The solution might include:

- Purchase of different/new equipment,
- Improved maintenance/servicing,
- Using the equipment for shorter periods of time and
- Information to staff on how to minimise the risks.

5.0 <u>Compliance Monitoring</u>

Any Management system, if left alone, will deteriorate over time: where lifts are concerned this could prove fatal. It is therefore a requirement of this Policy that the Director of Property & Facilities will periodically monitor that this statement remains relevant and effective and will, from time to time, require certain information from the Maintenance Management Team. This will include (inter alia): copies of maintenance records.

6.0 Further Guidance

L140 The Control of Vibration at Work Regulations 2005

HSG170 Vibration Solutions - Practical ways to reduce the risk of hand-arm vibration injury.

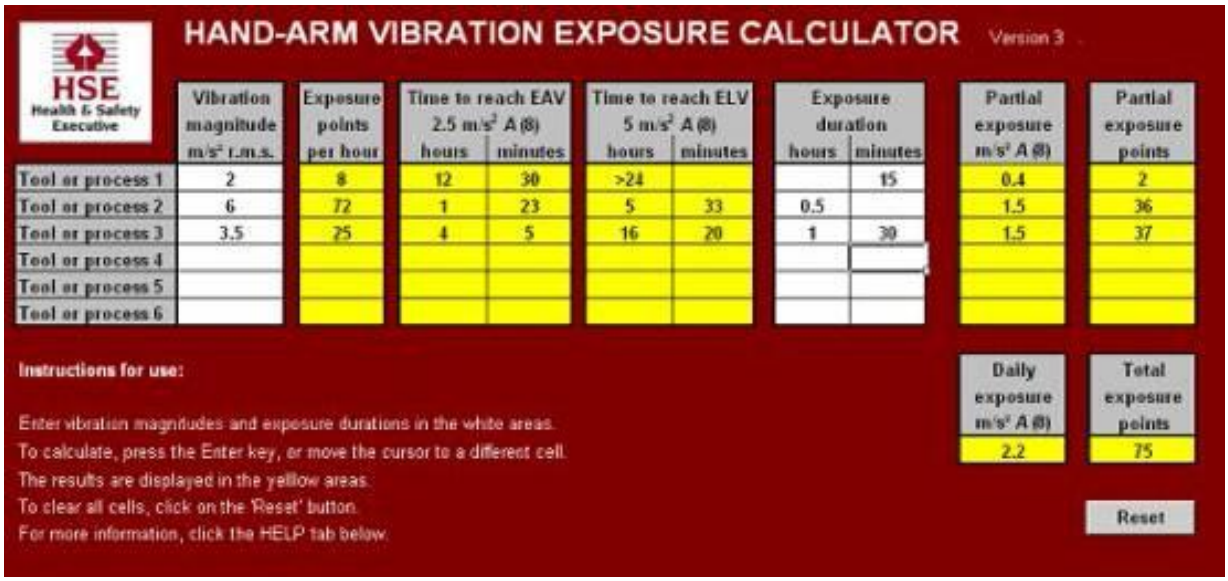
HSG175 (rev2) Advice for Employers on the Control of Vibration at Work Regulations 2005.

IND(G)126 (rev1) Health risks from Hand-Arm Vibration for Employees and Self-employed, 2002.

Supply of Machinery (Safety) Regulations 2008

Appendix 1: Hand Arm Vibration Exposure Calculator

http://www.hse.gov.uk/vibration/hav/vibrationcalc.htm



Guide to using the on-line hand-arm vibration exposure calculator

1. The calculator may be used online or, if you prefer, you can download and save it on your computer as a spreadsheet file (Microsoft Excel).

2. Click on the white areas and type in a vibration magnitude (in m/s^2) and an exposure duration (in hours and/or minutes). You can do this for up to six different tools or processes.

3. When you have entered all the numbers, press the ENTER key, or click on a different cell. The following values will then be calculated and displayed in the yellow cells on the right.

The *Partial exposure* is the vibration exposure (shown in both $m/s^2A(8)$ and exposure points) for each individual tool or process, and is calculated from the *Vibration magnitude* and the *Exposure duration*.

The *Total exposure*, also given in $m/s^2A(8)$ and exposure points, is calculated from the *Partial exposures*.

4. In addition to the partial and total exposure values, the calculator also uses them vibration magnitudes to produce the following values:

Exposure points per hour . The number if exposure points for every hour of exposure time for the individual tool or process.

Time to reach EAV (exposure action value). This is the total exposure time required for the individual tool or process, before the exposure action value (2.5 $m/s^2A(8)$ or 100 points) is reached.

Time to reach ELV (exposure limit value)*.* This is the total exposure time required for the individual tool or process, before the exposure limit value (5 m/s^2*A*(8) or 400 points) is reached.

5. The illustration above shows the calculator in use. In this example, three tools re used by an operator during a working day. The vibration magnitudes are 2, and 3.5 m/s^{2}and the total exposure times are 15, 30 and 90 minutes

respectively. These values have been typed into the white cells (you can use hours, minutes or a combination of the two for the exposure duration). The results (in the yellow cells) show the partial exposure values for the three tools and the total exposure which, at 2.2 m/s2 *A*(8) or 75 points, is below the exposure action value.

6. The cells can be cleared for another calculation by clicking on the Reset button in the bottom right hand corner.

Note: When you open the spreadsheet you may see a Microsoft Excel message asking you to decide whether to enable or disable macros. If your system settings allow it, you should enable macros. If not, the Reset button will not work, but the white cells can still be cleared by manually deleting their contents.