

EXPOSURE TO NOISE AND VIBRATION FROM HAND HELD TOOLS

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EXPOSURE TO NOISE AND VIBRATION FROM HAND HELD TOOLS

L3-MODU-ALL-HSE-PR-012

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EXPOSURE TO NOISE AND VIBRATION FROM HAND HELD TOOLS

DEFINITIONS & ABBREVIATIONS

OIM	Offshore Installation Manager
TSL	Technical Section Leader
PIC	Person in Charge
PPE	Personal Protective Equipment
MHSWR	Management of Health & Safety at Work Regulations
HASAWA	Health & Safety at Work Act
SJA	Safe Job Analysis
TBT	Tool Box Talk
PUWER	Provision & Use of Work Equipment Regulations
TOFS	Time Out for Safety
RIDDOR	Reporting of Injuries, Diseases & Dangerous Occurrence Regulations
VWF	Vibration White Finger
HAVS	Hand Arm Vibrations Syndrome
MMS	Maintenance Management System

1 PURPOSE & SCOPE

1.1 Purpose

The purpose of this procedure is to describe the Odfjell Drilling procedure for controlling employee exposure to noise and vibration from handheld tools.

Odfjell Drilling employs a number of different contractors and it is accepted that one or more of them will have practices and procedures in place that will address the requirements of the Guidance notes in different ways.

1.2 Hand & Arm Vibration Syndrome

Hand and Arm Vibration Syndrome (HAVS) is a condition caused by the excessive use of vibrating power tools.

HAVS affects the blood vessels, nerves, joints and muscles in the hands, arms and wrists of an individual. HAVS is preventable, but if damage is done it is permanent. See L3-MODU-ALL-HSE-PR-032 Occupational Health and Working Environment for vibration levels.

EXPOSURE TO NOISE AND VIBRATION FROM HAND HELD TOOLS

It is important not to use products containing nicotine (cigarettes, "snus", nicotine gum etc.) prior, during and after use of vibrating tools. Nicotine will constrict the blood vessel and increase the risk of developing HAVS.

1.3 Noise

Noise induced hearing loss is caused by exposure to noise levels that can lead to permanent hearing loss. With reference to the Norwegian limit values we define noise levels that can cause hearing loss as daily exposure levels of ≥ 80 dB (A-weighted) or exposure to peak sound pressure of ≥ 130 dB (C-weighted).

Other health effects from noise exposure are tinnitus, cardiovascular effects and psychological effects. There is also an increased risk of accidents.

1.4 Scope

To ensure there are procedures and practices in place on all MODU units that limit personal exposure to vibration and noise from handheld tools that has the potential to cause harm to employees to within acceptable limits.

2 RESPONSIBILITIES & AUTHORITIES

OIM	OIM is responsible for ensuring this procedure is implemented and adhered to at their site. They are responsible for ensuring all exposure details are recorded within the approved spreadsheet (Appendix 1) or designating a competent person to do so on his/her behalf e.g. Safety Officer.
HAVS Co-ordinator	HAVS Co-ordination shall be an onshore responsibility, periodically the exposure details will be submitted to the QHSE Department; the exposure details must be submitted on the approved spreadsheet (Appendix 1).
Safety Officer	Shall coordinate the HAVS process and be responsible for ensuring all exposure details are recorded within the approved spreadsheet (Appendix 1)
Technical Section Leader	Shall ensure that all vibrating power tools are part of planned maintenance in line with this procedure
Supervisors	Shall ensure that all personnel adhere to this procedure and complete exposure records

EXPOSURE TO NOISE AND VIBRATION FROM HAND HELD TOOLS

3 DESCRIPTION

3.1 Selection of Vibrating Power Tools

During the selection and purchasing phase for vibrating power tools, only those with a lower level of vibration will be selected. This approach will contribute to the reduction of exposure for personnel. However, it is also important to evaluate the effectiveness of the tool. A tool with low vibration levels might also be less effective, hence the use of the tool will be prolonged, and the total exposure will be as high as a tool with higher vibration levels but is more effective. It is therefore important to evaluate all the factors that can influence exposure to vibration.

Those requesting new tools are responsible for working with onshore support to ensure the process is adhered to.

3.2 Estimating Vibration Levels

According to the EU directive 2002/44/EC, suppliers shall report vibration emission data and uncertainty accordance with harmonized European standards. The harmonized standards were developed for estimating emission under typical use of the power tools. However, tools can be used for different purposes and will not be covered by methods for emission measurement, resulting in underestimating the exposure. Therefore, all vibrating tools procured to be used by Odfjell Drilling shall be evaluated against the manufacturer's harmonized emission level (a_h) included the uncertainty (k-factor) as recommended by CEN-TR 15350:2020. This will enable an estimation of the total exposure and usage time allowed for individual tools before the exposure limits and daily action values are exceeded.

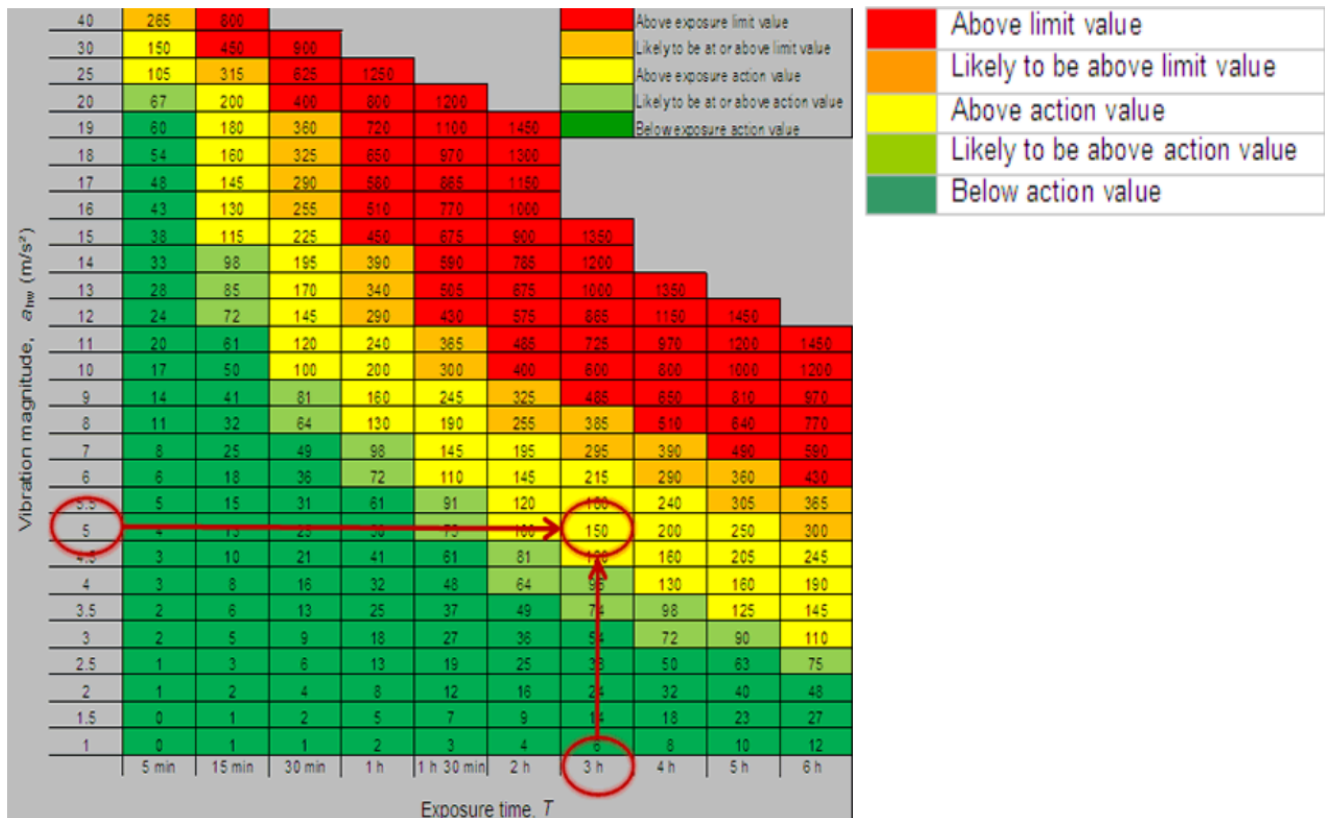
All vibration levels shall be registered in the Tools Register by all operations. The Tools register shall contain the following data: Type of tool, energy source, brand, model, year, vibration level included uncertainty (manufacturer's data), standard used, if available vibration level (field data), maximum usage time, sound level, recommended hearing protection, maximum usage time using hearing protection. This register is to be maintained by the Safety Officer.

For easier overview of the exposure, especially when more than one power tool is used, exposure point is used. The points are found in the Tools register or by:

- Find the vibration magnitude for the tool or process (or the nearest value) on the grey scale on the left-hand side in the table on the next page of this procedure.
- Find the exposure time (or the nearest value) on the grey scale across the bottom side.
- Find the value in the table that lines up with the magnitude and time. The illustration shows how it works for a magnitude of 5 m/s^2 and an exposure time of 3 hours: in this case the exposure corresponds to 150 points.
- Compare the points value with the exposure action and limit values (100 and 400 points respectively). In this example the score of 150 points lies above the exposure action value.

EXPOSURE TO NOISE AND VIBRATION FROM HAND HELD TOOLS

- Exposure points can be added together, for example where a worker is exposed to two or more different sources of vibration in a day.



3.3 Pre-use Checks

Prior to using any vibrating equipment, a visual pre-use check must be carried out. This does not need to be a formal recorded inspection. However, the user must ensure the equipment is safe to use.

Unsafe equipment can be dangerous and lead to potential incidents. Unsafe equipment shall be marked / quarantined and the TSL shall be notified.

3.4 Recording Exposure Time

UK specific requirement: All personnel using vibrating power tools are responsible for ensuring they record usage time. This must be done using the form in appendix 1. Completed forms shall be sent to the Safety Officer.

It is important to remember that capturing usage time is an estimate only. The actual trigger time on the vibrating power tools is likely to be much lower than the start and stop time suggests.

If personnel are exposed to vibrations around the limit value, they shall stop the use of vibrating tools. This shall be monitored by the safety officer.

EXPOSURE TO NOISE AND VIBRATION FROM HAND HELD TOOLS

3.5 Personal Protective Equipment

Users of vibrating power tools must always wear appropriate personal protection in line with company requirements.

Gloves can be important in protecting against HAVS. Although they do not prevent the effects of vibration entirely, they help keep the hands warm (especially in cold conditions), which allows for improved circulation.

Ensuring good circulation is an important step in the prevention of developing vibration related diseases.

3.6 Hearing protection

Hearing protection during use of handheld tool according to the table below is mandatory. The recommended hearing protection will be listed on the tag for each tool.

Noise level (dB)	Hearing protection
80-94	Single (Earmuffs OR ear plugs)
≥95	Double (Earmuffs AND ear plugs)

3.7 Planned Maintenance

Vibrating power tools must be maintained on a regular basis. The maintenance routines for equipment are controlled by MMS. It is the responsibility of the Technical Section Leader to ensure maintenance is performed.

3.8 Tagging Of Equipment

Vibrating power tools in use, are to be individually tagged with the appropriate information. This includes the colour code, total vibration, exposure point, the estimated maximum daily usage time, noise level, and recommended use of hearing protection according to the Tools register levels (section 3.2).

Rig

IFS/serial number

Vibration

 m/s²

Exposure point

 /hr

Max. usage time

 hr

 min

Noise

 dBA

Hearing protection
(Single/double)

EXPOSURE TO NOISE AND VIBRATION FROM HAND HELD TOOLS

The tag will be colour coded as recommended by "Working Together for Safety" (SfS) guideline 044/2021 as shown in the table below. RGB describes the colour balance between red, green and blue.

Vibration	Colour code		
m/s ²	R (Red)	G (Green)	B (Blue)
>20	90	64	153
10-20	127	64	152
5.5-10	178	140	193
4-5.5	239	62	66
2-4	255	210	0
<2	172	213	138

3.9 Risk assessments

All exposure of power tools is described in the Tools register. The maximal trigger time (usage time) of the tools is based on the action value and the limit value on 2.5 m/s² /100 exposure point and 5.0 m/s² / 400 exposure point respectively. The maximal usage time for noise is based on the action value of 80 dB and attenuation values of 12 dB for single hearing protection and 18 dB for double hearing protection. Any deviations from this register are to be risk evaluated according to L1-CORP-HSE-PR-002 HSE Risk Management.

If several tools with will be used during a shift for a significant time, or combined with exposure to high noise from areas, a detailed risk assessment shall be conducted.

It is important to note that the maximum usage time for noise is calculated based on the use of recommended hearing protection. If recommended hearing protection is not used the maximum daily usage time will be significantly reduced.

3.9.1 Mitigating actions

Any exposure exceeding the action limit shall be evaluated and mitigating measures to be implemented. Following measurements are recommended:

- Are the power tools procured giving noise and vibration levels as low as possible?
- Are the tools serviced as recommended by the suppliers followed? Any unusual vibrations or noise? The tools to be serviced or exchanged.
- If available. is the anti-vibration handle used?
- Always keep your hands warm.
- Is the work using vibrating power tools planned to minimise the exposures of noise and vibrations?
- Are the methods of use, minimising the exposure of noise and vibration practised?
- Is it possible to practise job rotation?

EXPOSURE TO NOISE AND VIBRATION FROM HAND HELD TOOLS

3.10 Storage of Equipment

It is important that equipment is stored correctly when not in use. Damage could occur if power tools are left on floors or exposed to the elements. Once an activity is completed, tools must be returned to the relevant storage area.

3.11 Health Surveillance

Inclusion in the company Health Surveillance program due to exposure of vibrations shall be based on risk assessments (ref. L3-MODU-ALL-HSE-PR-032).

This programme is designed to monitor the health of all personnel and includes checks for HAVS for those potentially exposed to hand and arm vibration.

If individuals show signs of developing HAVS, they must be prevented from using vibrating power tools. Alternative activities shall be considered.

3.12 Reporting for development of HAVS

UK: All HAVS cases shall be reported to the Health and Safety Executive (HSE).

NO: All HAVS cases shall be reported to the Petroleum Safety Authority Norway.

4 REFERENCES

4.1 Internal references

L1-CORP-HSE-PR-002 HSE Risk Management

L3-MODU-ALL-HSE-PR-032 Occupational Health and Working Environment

Tools Register

4.2 UK References

Health and Safety at Work Act 1974

Management of Health and Safety at Work Regulations 1992 (MHSWR)

Lifting Operations & Lifting Equipment Regulations 1998

Provision and Use of Work Equipment (PUWER) Regulations 1998

The Control of Vibration at Work Regulations 2005 (the Vibration Regulations)

Reporting of Injuries, Illnesses and Dangerous Occurrence Regulations (RIDDOR) 2012

EXPOSURE TO NOISE AND VIBRATION FROM HAND HELD TOOLS

Supply of Machinery Regulations

Physical Agents (Vibration) Directive

4.3 NO References

Work Environment Act

Management Regulation

Frame Regulations

Activities Regulation

NORSOK S-002 Working Environment

5 APPENDICES

Appendix 1: Vibration Exposure Monitoring Sheet.

Appendix 2: Tools Register