Operator Toolbox Talk

Why Hand Arm Vibration Is Important

Reactec

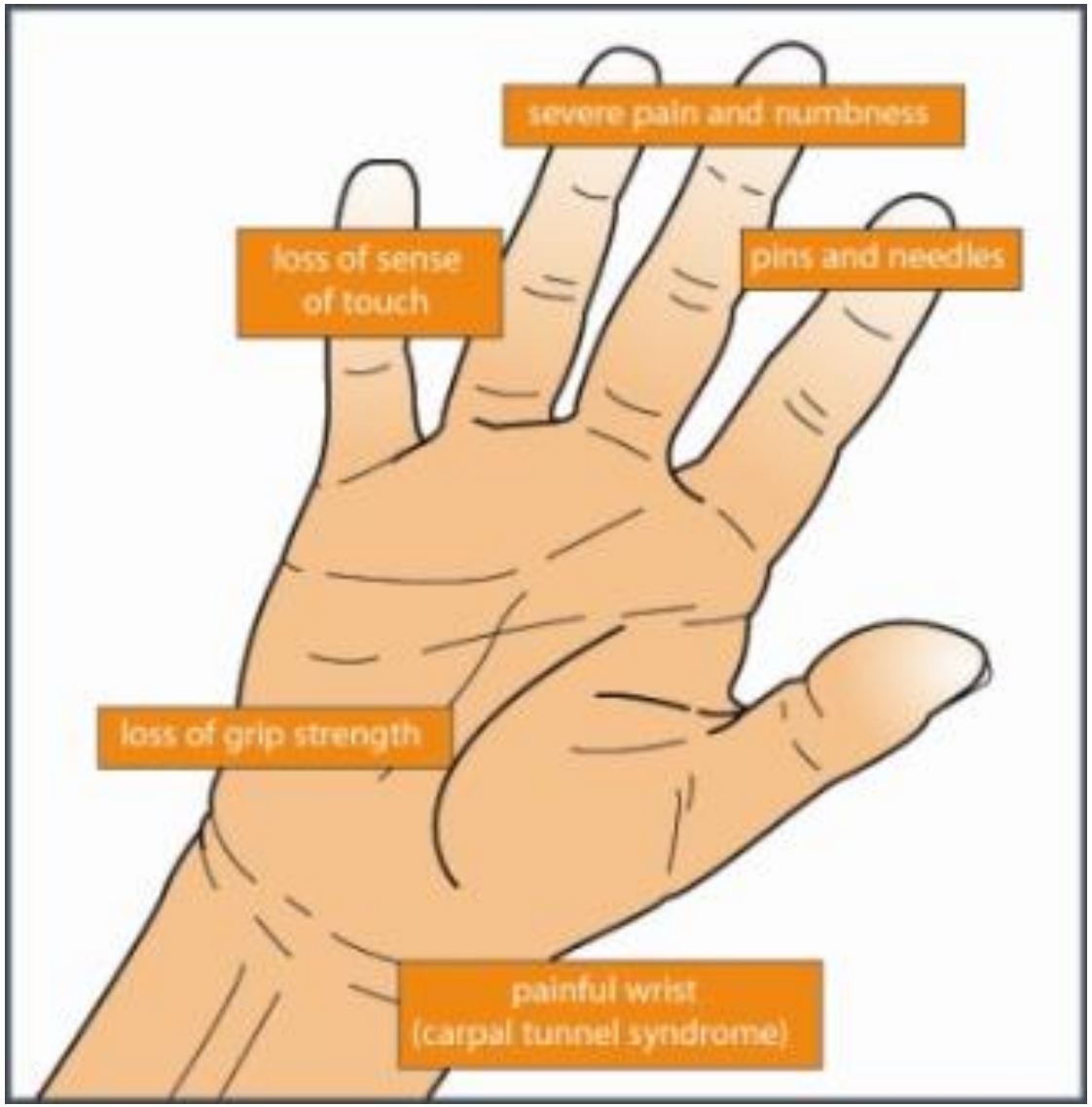
Hand-Arm Vibration Syndrome

Hand-Arm Vibration Syndrome (HAVS) is the medical term for damage that may occur to the fingers, hands and arms as a result of working with vibrating tools or machinery. Vibration injuries are divided into three subgroups:

1. Neurological injuries
2. Vascular injuries
3. Musculoskeletal injuries

Impact:

- Unable to hold a mobile phone or a pint
- Unable to do intricate work eg tie a shoelace, undo small buttons
- Sleepless nights



HOW LIKELY ARE YOU TO DEVELOP HAVS?

10% of employees exposed at the exposure action level will contract HAVS within **12** years or within **6** years if exposed to the exposure limit level. *(HSE)*

"Exposure below the Action Value cannot be considered safe..." (HSE)

D_y, years	4	8	12	15
A(8), m/s^2	7	3.7	2.5	2.0
Daily Exposure Pts	784	219	100	64

Established correlation between time to vascular damage (white finger) and average daily exposure

Meeting HSE Legidlation

The HSE exposure point system to quantify risk

To estimate HAV exposure risk – time of exposure and the representative vibration magnitude of each tool used cumulated across all tools each day.

100 points (**8** hrs of a tool with **2.5** m/s^2)

EAV

Take action to reduce exposure.
1 in 10 develop HAVS in 12 years at this level.

400 points (**8** hrs of a tool with **5** m/s^2)

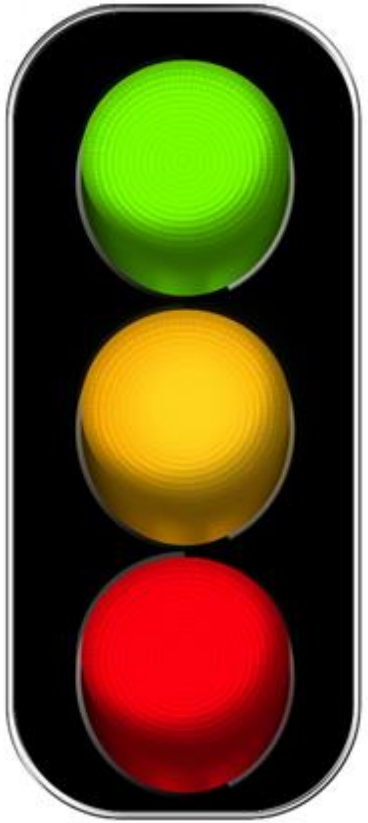
ELV

Do not work above this level.
1 in 10 develop HAVS in 6 years at this level.

Vibration magnitude m/s^2	15 m	30 m	1 h	2 h	3 h	4 h	5 h	6 h	8 h	10 h
40	800									
30	450	900								
25	315	625	1250							
20	200	400	800							
19	180	360	720	1450						
18	160	325	650	1300						
17	145	290	580	1150						
16	130	255	510	1000						
15	115	225	450	900	1350					
14	98	195	390	785	1200					
13	85	170	340	675	1000	1350				
12	72	145	290	575	865	1150	1450			
11	61	120	240	485	725	970	1200	1450		
10	50	100	200	400	600	800	1000	1200		
9	41	81	160	325	485	650	810	970	1300	
8	32	64	130	255	385	510	640	770	1000	1200
7	25	49	98	195	295	390	490	590	785	865
6	18	36	72	145	215	290	360	430	575	720
5.5	15	30	61	120	180	240	305	365	485	605
5	13	25	50	100	150	200	250	300	400	500
4.5	10	20	41	81	120	160	205	245	325	405
4	8	16	32	64	95	130	160	190	255	320
3.5	6	12	25	49	74	98	125	145	195	245
3	5	9	18	36	54	72	90	110	145	180
2.5	3	6	13	25	38	50	63	75	100	125
2	2	4	8	16	24	32	40	48	64	80
1.5	1	2	5	9	14	18	23	27	36	45
1	1	1	2	4	6	8	10	12	16	20

Daily exposure time

HSE Thresholds



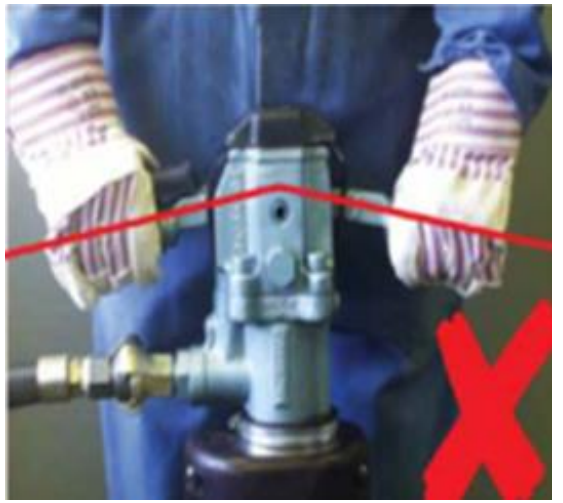
- **Green**
  - **0 – 100 points (for healthy workers)**
  - **Below Exposure Action Value**
- **Amber**
  - **100- 400 points (for healthy workers)**
  - **Exceeding Exposure Action Value**
  - **<u>Action must be taken to reduce risk</u>**
- **Red**
  - **Over 400 points (for healthy workers)**
  - **Exceeding Exposure Limit Value**
  - **<u>Work should stop</u>**

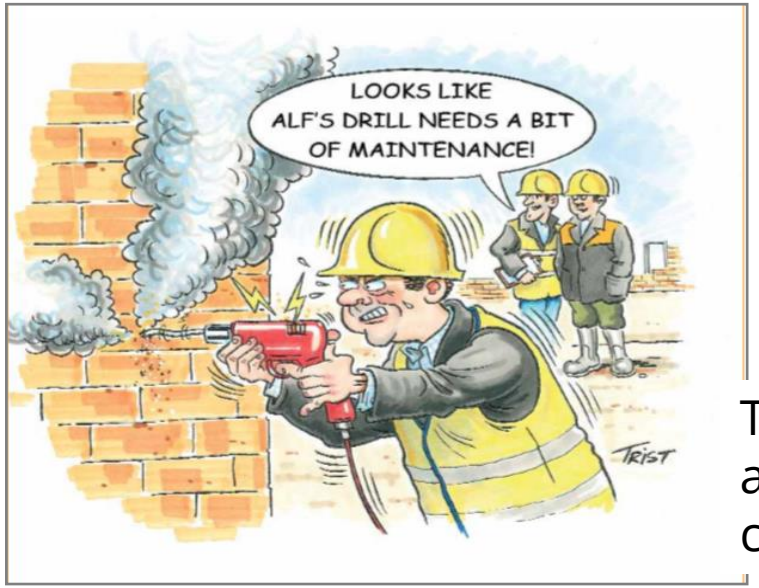
N.B. Workers identified as either AT RISK OF DEVELOPING HAVS or AS HAVING EARLY STAGE HAVS should be managed to lower levels of daily exposure

Factors Affecting Exposure Risk

Tool Selection

Applying excess force to a tool





Tool and it's accessory condition

Gripping the tool too tightly

HOW GOOD ARE YOUR RISK ASSESSMENTS?

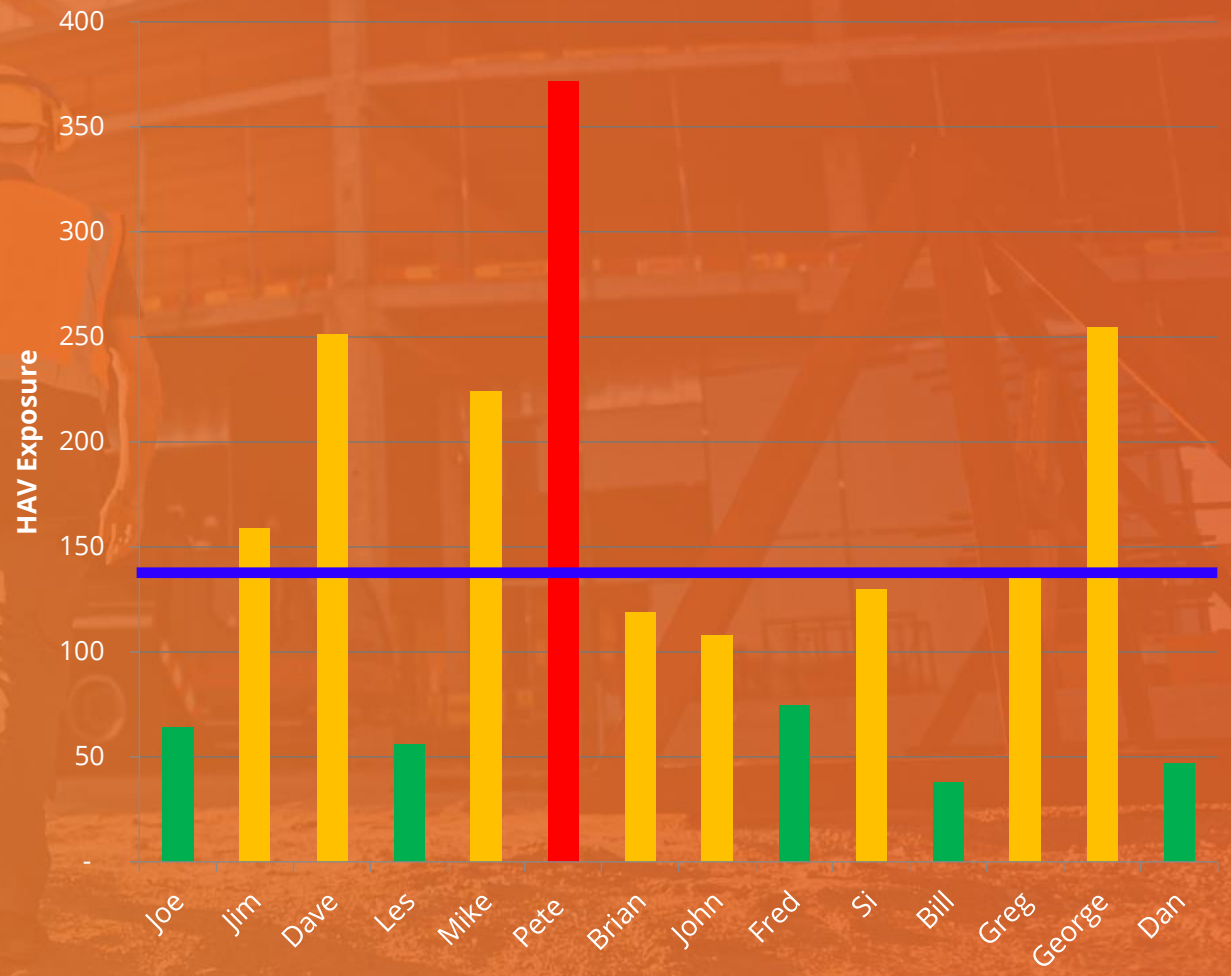
What is the risk to the individual?

A company requested a case study to understand the effectiveness of a generic risk assessment of HAV exposure risks.

A number of 2 man and 3 man teams were tasked with digging same sized hole in the same type of road with the same tool type

The task based assessment from the typical excavation time and average vibration concluded that for a 2 man team the exposure should be no greater than 140

Chart displays the max exposure risk experienced for each individual when digging one hole while sharing the work*.



HAVWEAR and RASOR – how do they help?

A monitoring device that automates the calculation of HSE HAV points and displays points and alerts for high exposure and proximity to colleagues

A communication hub to gather data from multiple health risk sensors including HAVwear. Remote supervision for over the shoulder intervention & Lone Worker

HAVWEAR and **RASOR** work with the Reactec Analytics to report exposure data and support optimisation of controls to reduce risk ALARP.

Using the System

1. Sign out

From a Dual Charger or Docking Station, use the Operator ID card to sign out a HAVwear

2. Collect

Unclip the HAVwear module from the bay with the flashing LED light

3. Protect

Insert HAVwear module into a holder, thread the strap through the holder and snugly fit the strap around the wrist

4. Connect

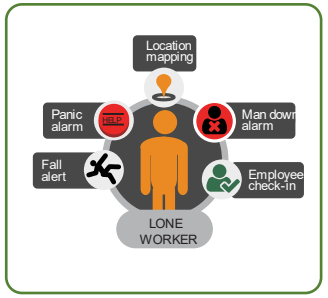
"Connect" with each tool by pressing and releasing the HAVwear button before placing the HAVwear device next to a tool tag until you hear a beep.

5. Assign

"Assign" a RASOR to an individual by removing the RASOR from the charger, press the RHS button on the RASOR place an ID card on top of the RASOR until a beep sounds.

6. Manage

Gather colleague real-time data from HAVwear and other sensors within 30m or track their location for immediate intervention or remote supervisor alert monitoring.



7. Lone Workers

Remotely view employees exposure levels, location and be alerted to any alarms from man-down, lack of check-in or manually initiated panic.

8. Return

At the end of a shift return the HAVwear to a Docking station to recharge and transmit data

9. Reduce

View reports online or by email of individual and overall HAV exposure and the source of risk.

Note

- Place the **HAVWEAR device** into the docking station retaining clips and press down on the orange plastic moulding of the device to ensure it is firmly clipped into place. Do not press down on the LCD screen of the unit as repeated or excessive

HAVWEAR

ELV exceeded

4th alert *20 sec*

EAV exceeded

3rd alert *10 sec*

Split into 3 equal parts to display incremental increases in exposure.

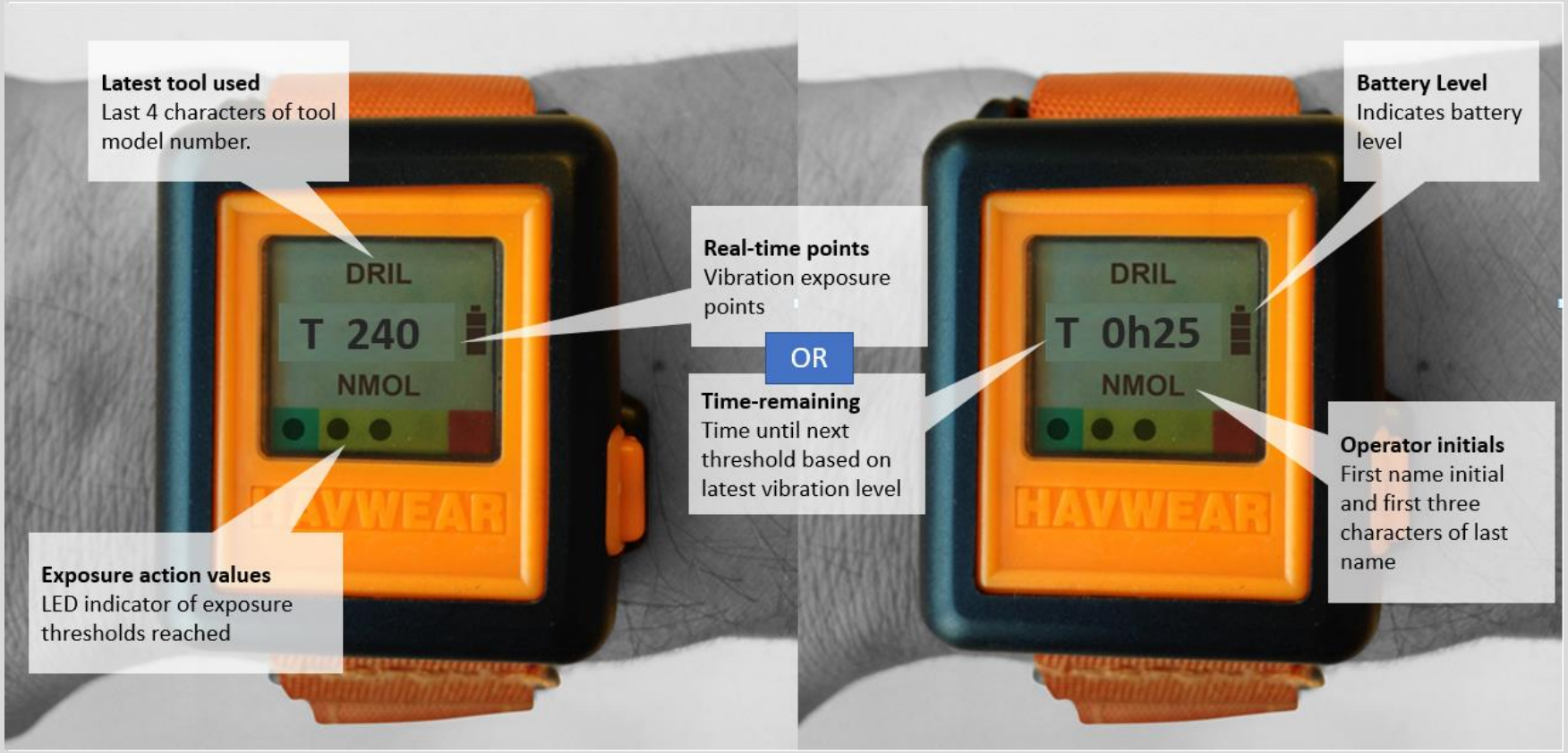
2nd alert *5 sec*

1st alert *2 sec*

Below EAV

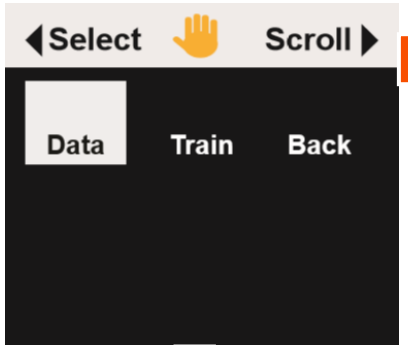
Alerts Beeps & vibrates

Colour bar displays exposure action values

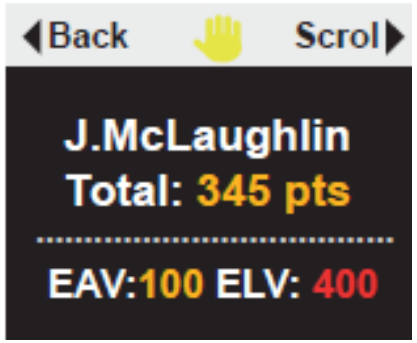


LIVE Training Aid - RASOR

HAV main screen

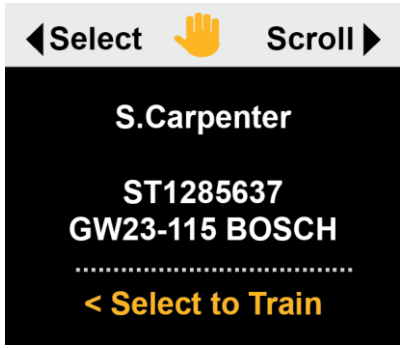


Select “Data”



Select “Data” - screen will display for individuals within range their current daily exposure and thresholds

Select “Train”

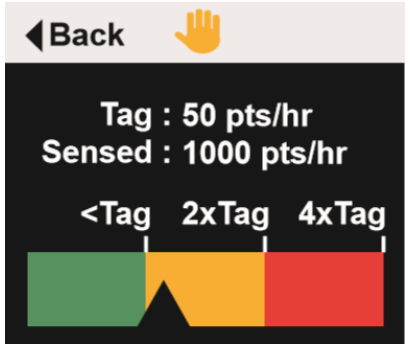


Select “Train” screen will display:

- Operator Name
- Tool Id
- Tool Name

Press “Select” to train the displayed operator

Press “Select”



- Tag vibration magnitude expressed in exposure points per hour
- Live sensed vibration in exposure points per hour
- Gauge graph showing the live sensed vibration relative to the tag vibration.

HAVWEAR
2 Concurrent Assessments

2

Pre-determined expected vibration magnitude

X

Trigger time of Tool Use

=

Tool Exposure Points (TEP)

COMPLIANT with HSE Guidance

2

Real use sensed vibration magnitude

X

Trigger time of Tool Use

=

Sensed Exposure Points (SEP)

Independently validated by the IOM

Using HAVWEAR – Key Points

How it works

- The HAVwear constantly senses vibration
- It determines if the nature of the vibration is from a tool to decide that a tool trigger has been pulled.
- If an operator forgets to tag a tool after sign out, the HAVwear will display the SEP points as TEP points and store as TEP points with no tool identity. As soon as one tool tag is read in a shift TEP and SEP are created independently.
- The trigger time together with the last read Tag vibration is used to calculate TEP points.
- If an operator forgets to tag the next tool, the TEP points will be based on the last Tag read.
- If the operator will be subject to material vibrations OFF tool which are not a source of HAVs, an OFF tag or the OFF button can be used to ensure TEP points are zero. This should be considered especially when moving OFF a high vibration tool.
- An OFF tag has an identity of OFF and a vibration level of **0.0m/s²**. It allows a controlled use of OFF.
- Setting the OFF button allows all operators an ability to switch off detection of TEP points.
- TEP is detected again as soon as another tag is read.
- SEP and SAFE-DISTANCE are not affected by an OFF tag or OFF button.

A company wide setting on the Analytics determines if the operator screen shows TEP or SEP and the data set presented to report users

What should you know

01 HAVS is a debilitating disease – pay attention to **HAVWEAR** warnings

02 When tools have been “tagged” it is important to tag to each tool.

03 If moving off high vibration tools switch the **HAVWEAR** OFF

04 Return the unit for charge each day.

05 Do not remove the **HAVWEAR** from your wrist unless switched OFF or returning to the Docking Station.

Which would you rather have?