Light touch

Businesses waste a lot of money on hand–arm vibration assessment, argues Peter Wilson. Instead he offers a pragmatic guide to best practice in effective risk assessment

THE depressing evidence is that a substantial proportion of the time and resources dedicated to hand-arm vibration (HAV) risk management programmes is not well spent, despite the best of intentions. HAV still offers a minefield of opportunities for risk management mistakes based on misinformation and myth.

Much of the safety "industry" is based on risk measurement. This sometimes generates a culture of risk assessment as an end in itself, rather than as a precursor to more challenging action to minimise the risk. This assessment culture can cause particular problems when it comes to vibration. Because vibration is different.

If you measure a tool's vibration in the field for any given activity, you have a value. If you measure several times, back-to-back, you get a range of values. Measure again a month later and the range will be much wider. Change the operator and the range becomes wider still. Also, some tool types give lower vibration values when new, while others change little as they age.

All this means there is no single "correct" value for a tool's vibration. The sole objective of an assessment is to establish the typical range of values for each item of equipment. Some tools produce a small range: 4m/s^2 to 6m/s^2, for example, and

others a larger range, say 5m/s^2 to 15m/s^2. This key concept has prompted one of the most commonly raised questions in vibration workshops and roadshows: "Surely you need to measure each individual tool used by operators on a given activity?"

The answer is "No". Every time you measure a tool, you will get a different result. What you have to do is to establish the likely range within which the vibration values will fall.

Once you have your range of likely values, you need never assess again. So, while the first assessment may be more difficult and costly than, say, one for noise, it only has to be done once. If you are paying suppliers or consultants to measure the vibration of your tools every one or two years, it's very good business for them, but completely unnecessary. Though you may sometimes have to re-evaluate finger-on-trigger times for tools if you change operations, unless you bring in a new tool model, you never have to repeat the vibration assessment.

What to do

The best starting point for a vibration risk management regime is to identify hazards from plant and activities. The first step is to set up a HAV tool register that identifies and lists all the activities and tools that could be vibration hazards. Don't underestimate the time and resources required to generate a comprehensive list of equipment.

Review the results by tool type and activity and determine the minimum number of tools for which you can justify acquiring vibration data. For a tool that is used with a variety of sockets, for instance, choose the best and worst examples, and assume the rest fall between these values.

Use published data. As we've said, don't measure unless you absolutely have to. Vibration measurement is time consuming and expensive. The HSE recommends using reliable published *field* data for risk assessments wherever practical. They would rather you spent your time and resources on risk reduction rather than wasting them on acquiring data that is already available.

The key to using published field data in assessments is to ensure that it's from a reliable source. Data for some categories of tool is available from the HSE website and from a few other sites and organisations, such as trade associations. You need to interpret the data carefully, as many values are manufacturers' figures, not field data, or of unknown provenance.

Once you have completed your virtual assessment, you can then arrange measurements for the selected cross-section of remaining tools.

Manufacturers should currently be updating their declared vibration values under the EN 60745/ISO28927 standards. These provide higher and more realistic values than the old ISO8662 standard, but you still can't use manufacturers' declared vibration values for assessments unless you can show that they are representative of your real-use tool vibration.

There is no commercial incentive for suppliers to admit to the often much higher vibration values associated with field use, though you may not get this impression from some of their published information. In particular, it would be very unwise to base a risk assessment on the "traffic light" system used by many hire companies, which is currently based on declared values.

Keep it real

All measurements must be made under realistic operating conditions and by a competent person. Vibration is time consuming and difficult to measure accurately as the transducer which takes the measurements has to be attached to the tool. The following are the key factors for accurate measurements:

- ensure the transducer is rigidly attached to the tool at the right location or locations (multiple handles). Don't use hand-held transducers unless there is no alternative as they give the wrong results. One practitioner complained recently that the company that came in to measure 200 of their tools mounted the transducer on them with insulting tape. The assessments all had to be repeated.
- repeat measurements at least three times to ensure that you get consistent results and measure for a sufficient period to give a reliable average value for the activity.

As well as tool vibration values, you also need to assess the finger-on-trigger times for each activity. It's common to over-estimate these times: "I use that grinder for two hours a day" will often shrink to just 20 minutes of trigger time with measurement. You can gather reasonably accurate data by hand timing. Alternatively, simply strap low-cost timer/dose counters to the tools to give the exact figures which are then used to assess risk against the exposure action and limit values of 2.5m/s^2 and 5m/s^2.

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As with vibration values, there will often be a substantial variation in exposure times from day to day. Don't be tempted to implement expensive monitoring and recording regimes in an attempt to continually update or re-evaluate likely exposures. Unless an activity is very close to the exposure limit value and you can justify the added cost, keep it simple by using the typical worst case values for your risk assessment. The resources are better spent on risk reduction.

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