

Judgement call

Black and white is not always best: professional engineers should use their judgement, says **Harvey Dearden**

THERE is a lamentable reluctance on the part of some engineers to exercise their professional judgement, particularly in matters of health and safety. This often manifests itself in cries for 'black and white' standards. The problem here is that couching standards in completely unequivocal terms is likely to impose obligations that are inappropriate in many circumstances. If the stipulations were black and white, they would be 'rules' not 'guidance'. It is the role of a professional engineer, having acquired the appropriate competencies, to exercise professional judgement with due regard to pertinent guidance. We should rejoice in this, this is one mark of the professional; grey is good! Attempts by some engineers to remove themselves from any question of liability can result in subtle but nonetheless significant distortions of business endeavours, with massive cost implications and even a net loss of safety.

Consider the following statements drawn from the *Code of professional conduct for engineers and risk issues*, as originally published by the Engineering Council UK:

- Judgement is required to match the approach to the nature of the hazard

and the level of risk. This might vary from a simple assessment to a formal safety case.

- Uncertainty is a feature of many aspects of risk management. Be aware of this, and use risk assessment methods as an aid to judgement, not as a substitute for it.

The code does not say "abdicate all responsibility where there may be a question of personal liability" or "distort engineering policy and practice as necessary to cover your behind."

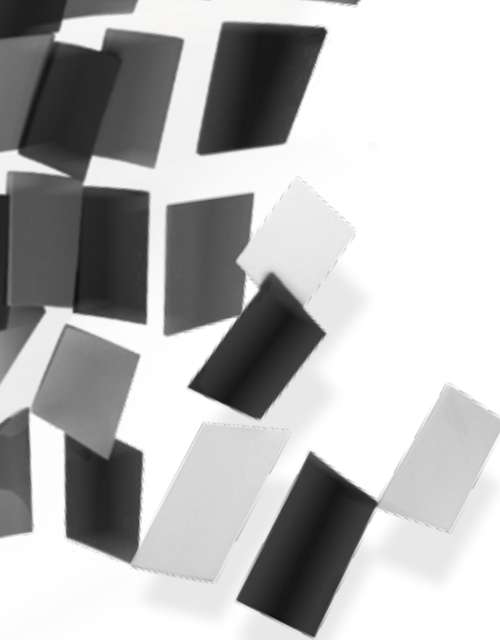
Good standards recognise the need to exercise judgement and in many areas will provide guidance rather than definitive stipulations. Some engineers will attempt complete compliance with a standard, but compliance in every particular is often not a realistic ambition. You approach compliance asymptotically along a curve of diminishing return; you may approach closer and closer to full compliance, but it requires ever-increasing effort and investment. There is a point where the marginal increase in compliance does not warrant the additional effort, which may be more gainfully employed on other safety concerns. Professional judgement must be exercised to identify when this point has been

reached.

Note that 'exercising judgement' does not mean the same as 'going out on a limb', which would imply accepting a significantly higher degree of risk; it will often simply come down to a matter of employing some common sense rather than 'going through the motions' of strict compliance even when there is little or no benefit (or even conceivably negative 'benefit').

Another misjudgement may be to attempt 'perfection' on a first pass; it may well be better to use a staged approach. If you first implement the more significant provisions, you may be better placed to make a more informed and effective approach for the aspects or areas that remain.

The wish of some engineers to avoid any accountability is recognised by some as a marketing opportunity. Occasionally you will find that interested parties use 'scare tactics' to promote their product or service. It is all very well picking out individual clauses from the standards to 'demonstrate' a particular requirement, but without proper consideration of the context and the underpinning philosophy of the standard, it is easy to end up with a wrong-headed approach.



If ever you are told that you need to 'rip it all out and start again', whether metaphorically or literally, you need to take a step back and consider whether the 'logic' that is being deployed has carried you to a place that is no longer sensible. Do not fall into the trap of assuming that a logical proposition is necessarily a sensible one – which is itself an error in logic! Careful consideration of the starting point and the explicit and implicit assumptions being made may reveal that a logical conclusion may be far from sensible.

I saw an example where a company had been hired to review existing safety system provisions. A typical argument deployed in its report ran as follows (here distilled to its essence):

A legacy system has a number of components. None of these has a performance level certified in accordance with a new (but not retrospective) standard. Therefore, conservatively assume the performance level is <X. But the standard specifies performance level >X for components being deployed in systems like the one being considered. Therefore, replace all the components.

Logical, but very far from sensible. The equipment had been procured and installed in accordance with good practice and there was no suggestion that it was not fit for purpose. An intelligent, responsible review, exercising appropriate judgement, would have identified this.

Unfortunately some standards themselves suffer from this same condition; logical but not sensible. I can see how this comes about; you start with a simple premise and build logically, each step, each additional principal and consideration flowing inexorably, indisputably from there. The

final structure is entirely self consistent and rigorous, but somewhere along the way it becomes so very much more than simply fit-for-purpose.

You start with a brick and end up with a cathedral, when what you really needed was a small extension. Again there is a need for standards committees to look back to the starting point and consider where logic has carried them and whether the position remains sensible in terms of the ultimate objective of the mission.

I do not suggest there is any conspiracy here, but there is a potential for experts to become seduced by their own expertise and to pursue excellence or refinement for its own sake or in competition with one another. There are also those that have a vested interest in elaboration, who look to become the new priesthood with exclusive rights to the performance of rituals.

I am confident it is possible to keep faith with many standards in a relatively straightforward manner. But keeping sight of the wood, when everywhere you look there are trees, can become a real challenge. Let me stress that it is not usually that the standards or guidance explicitly require over-elaborate provisions; but this is, I fear, often the inadvertent consequence.

The daunting prospect of some standards will understandably encourage many to seek support from consultants. The employment of consultants in this regard is entirely reasonable, but in attempting to button down every last aspect with complete rigour, in fulfilment of actual or perceived contractual obligations, there can be a tendency towards over elaboration. I suggest that partnerships with consultants in this sort of development should focus on fitness-for-purpose and

prudence rather than complete rigour.

Another danger is that in order to try and place themselves beyond possible criticism, engineers will require all sorts of certified assurances in matters of supply/recruitment etc. The 'benefits' may be quite illusory and place unwarranted burdens and unduly-restrictive constraints on business. Intelligent rather than slavish, unthinking compliance is needed.

The UK's Health and Safety Executive (HSE) is faced with a complete spectrum of compliance within industry; from those that are well aware and strive to do the right thing, to those that are completely unaware and oblivious to the risks they run. Our predominant concern should be with the latter end of the spectrum, suitably weighted by consequence.

The important thing is to bring a considered, systematic and responsible approach to these matters; I cannot get too excited about whether every last 'i' is dotted, or every 't' crossed. And I don't believe the HSE can either. Insistence on an entirely rigorous approach where not only the spirit of a standard is met, but also every letter (including the 'i's and 't's) may well produce unwarranted distortion in deployment of resources, resulting in a net loss of safety. You need to consider where you will get the biggest safety 'bang'(!) for your buck. Consider also that there is often a trade-off between rigour and robustness; a more rigorous approach may look good on paper, but may well prove more fragile in operation, with a tendency to suffer inadvertent corruption and with people prompted to make shortcuts. This can, in turn, undermine the wider safety culture within an operation. **tce**



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practical safety

HSE's ensures compliance with the law. In general the law requires that health or safety risks are reduced 'so far as is reasonably practicable', interpreted by HSE as risks have to be reduced to the point where the cost of any further risk reduction is 'grossly disproportionate' to the benefit gained in terms of the reduction in harm to people. HSE refers to this as reducing risks to 'as low as is reasonably practicable (ALARP).

Whether or not particular measures achieve the ALARP criterion is a matter for judgement in the specific circumstances. Technical standards may be used as a guide to

what may achieve ALARP. However, standards that are not application specific, for example IEC 61508 and IEC 61511 will require a considerable degree of judgement in order to determine what needs to be done in practical terms so that risks are reduced to a point that may be considered to be 'ALARP' in specific circumstances. Whilst such standards allow considerable freedom in determining what needs to be done to meet ALARP, competent judgement is essential in order to avoid either over-zealous application (resulting in higher costs than necessary) or ineffective application (resulting in not reducing risks to ALARP).

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