The Engineering Council's 'Guidance on Risk' was reviewed, and PEIs were invited to comment on the proposed new version. The review was undertaken by a Working Group comprising members from several PEIs and Professional Affiliates. Please see an anonymised summary of their responses below.

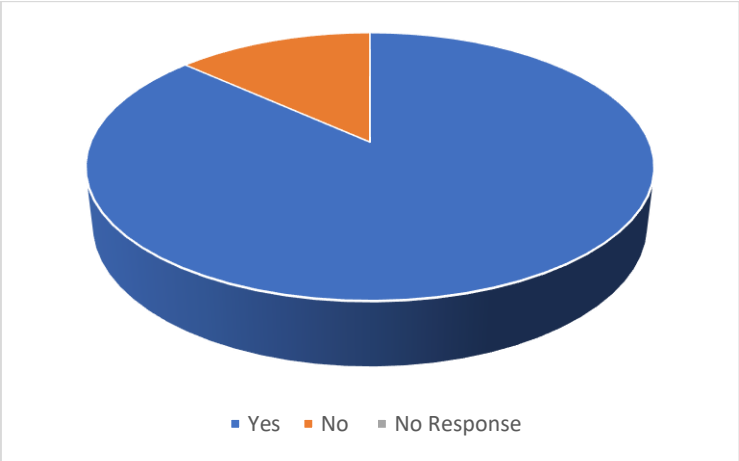
Survey responses – Review of Risk Guidance Note

Responses represent 16 institutions

Q1. In making the revisions, the Working Group aimed to:

a. **retain the concise, clear, easy to read approach**
b. **keep focused on the document's purposes: supporting all engineering professionals in their practice, and providing material for institutions' membership/sector materials**
c. **ensure this guidance applies across the profession.**

Does your Institution feel these aims have been achieved?



If not: why not?

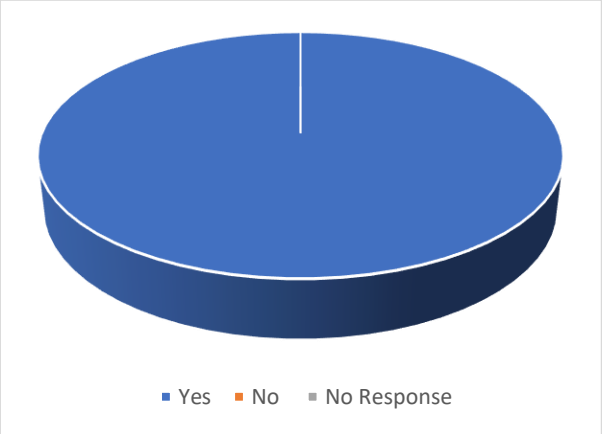
- "Aims not entirely achieved. Document a bit wordy."
- "We feel more structure and meat is required, particularly in relation to safety-related risks."
- "In the field of water and environmental management, engineers deal with considerable uncertainty and often adopt the precautionary principle which this document does not appear to recognise."

Please suggest any improvements:

- "Simplify and make more concise"
- "The guidance provided is explicit and easy to understand. The challenge however remains to convey the message in as few words as possible."
- "Some of the consultees suggested breaking the blocks of text into smaller sections."
- "Please see our answer to Q7."
- "A great deal of structural engineering is about effective risk management. There is continuing need to remind practicing engineers that there are inherent uncertainties in the design and implementation of any construction activity. Hence constant reminders and encouragement is to be welcomed."
- "Engineers dealing with environmental issues are used to recognizing they don't understand the interconnectivity of all those issues. Hence, they adopt the "precautionary principle". The previous document used the phrase "...adopting a conservative approach." which could be taken to recognise the "precautionary principle". This is of especial importance moving forward with targets for Net Zero by 2050 and tackling climate change."

- “Members of various safety specialist groups have expressed a view that the changes in the text to introduce ISO 31000 and changed definitions of risk has not helped to achieve these aims. (See Question 3: Inclusions below). The observation has been made that the focus of the document is more towards management/investment rather than engineers, and that references to elements such as risk appetite may make the document less relevant to engineering.”

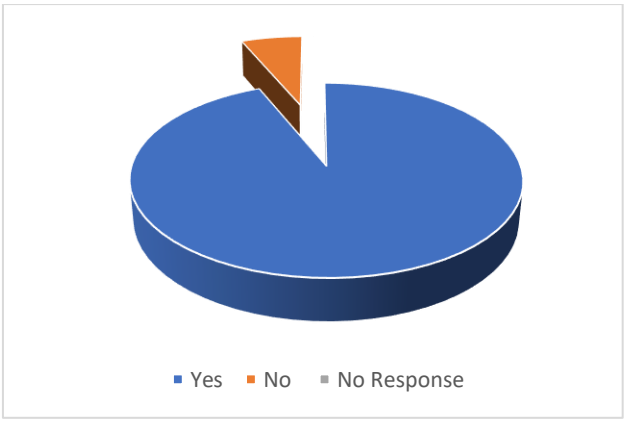
2. The target audience is extended to be the same as the audience for the Statement of Ethical Principles and the Guidance on Sustainability ie, all those working in engineering. Does your institution agree with this approach?



If not, why not?

- “Responded as 'yes' although comment has been received from volunteers suggesting the assumption is arbitrary. Those seeking guidance on risk may not be the same people that seek guidance on ethics and/or sustainability.”
- “This approach is generally supported.”

Question 3. Principle 2 states ‘broad’ in place of ‘systematic’, to be less constraining. Does your institution support this revision?

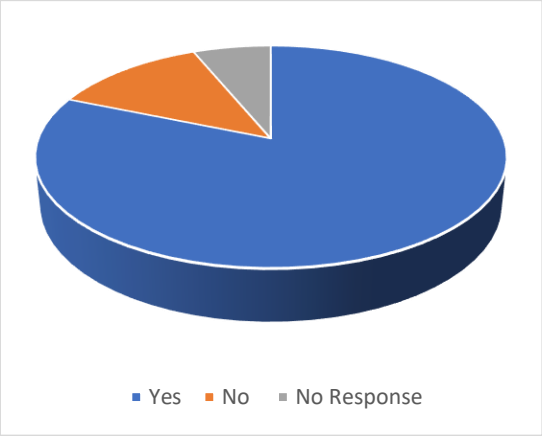


Optional comment:

- "The use of both terms (which have different meanings) is preferable, and Principle 2 does indeed use both terms. Note that the wording of the Principle as stated on page 6 (Adopt a systematic, broad and holistic approach to risk management) does not align with that on page 2 (Adopt a systematic, broad and holistic approach to risk identification, assessment, management and review)."
- "We believe there is a place for both (again see Q7 response below)”

- "Much of our literature talks about systematic but we do encourage free range thinking (broad) since experience of failures often shows us that the inherent cause was something overlooked (including human communication causes)"
- "This now includes 'broad and holistic' rather than just holistic, it may be argued that these both mean the same thing so not sure of the need for the addition of broad."
- "The draft in fact uses 'broad' in addition to 'systematic', which seems appropriate."

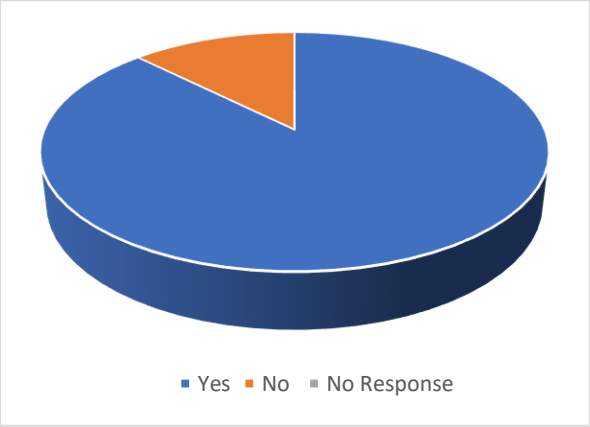
Principle 3 states 'suggest' not 'seek', for wider applicability. Does your institution support this revision?



Optional comment:

- "'Suggest' seems to have weakened the intent although the word 'seek' rather than 'suggest' is used in the underpinning bullet points. A better wording would be 'Comply with legislation and codes but be prepared to work towards further improvements'."
- "'Propose' may be a better and stronger word?"
- "There are construction projects were risks need to truly be as low as reasonably practicable (ALARP). Equally there are other projects where a measure of risk is tolerable. On any project there can be debate over where that line is. It may be inappropriate to always seek lower risk as opposed to suggesting measures which may or may not be considered worthwhile."
- "Whilst this change is considered acceptable, retention of 'seek' has been recommended as more appropriate, together with suggestions for various alternatives/improvements: 'be open to improvements'; 'drive improvements' ('suggest' feels weak); or 'identify improvements' (which includes actively seeking but also implies promoting)."

Principle 4 now includes 'contextual' to add rigour. Does your institution support this revision?

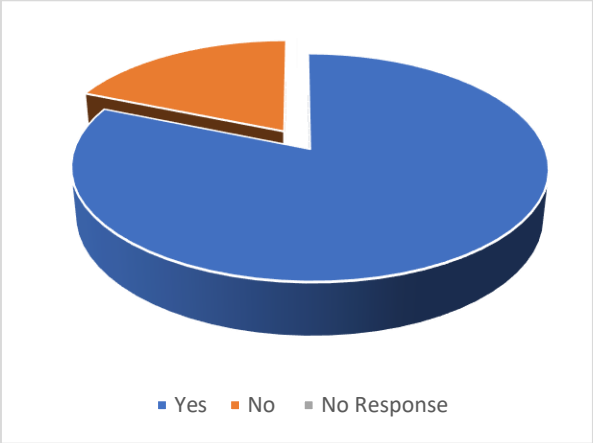


Optional comment:

- "Contextual seems a bit remote. We don't understand what it is getting at."

- "However, the work 'contextual' is missing from the statement on page 7 of the revised pdf so that needs correcting."
- "Something in plain English such as 'Ensure good and relevant communication with the others involved' rather than the use of the term 'contextual' would be preferred. Again, note that the wording of the Principle as stated on page 7 (Ensure good communication with the others involved) does not align with that on page 2 (Ensure good contextual communication with the others involved)."
- "Not clear that this adds rigour though?"
- "The word ‘contextual’ is included on page 1 (red sheet) but not in the body of the report. It is certainly appropriate. There is difficulty in getting things into perspective even to informed audiences. So as engineers within our own peer group we have to try and put the levels of uncertainly and difficulties (costs) of controls into perspective so informed judgement can be made. In the UK we consider a wide range of extreme events in the design of nuclear plant (because the consequences can be intolerable). But we don’t do that for lesser structures: we accept the risk."
- "There were no objections to the inclusion of ‘contextual’, but it was noted that this change had not been made in the main text on p7.
  It is suggested that ‘Learn from incidents and near misses’ should be added to this principle."

Principle 5 now states ‘sustainable’ rather than ‘lasting’ systems, to improve accuracy. Does your institution support this revision?

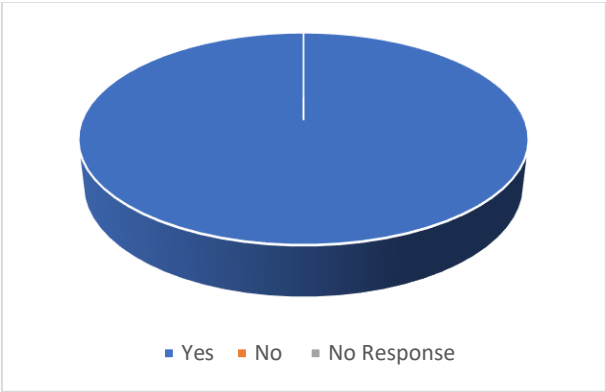


Optional comment:

- "Sustainable has a clear SDG-linked meaning in the context of engineering"
- "Clearly!"
- "We have responded as 'yes' although comment has been received from volunteers that the word ‘sustainable’ has become associated with the environment. This is confusing here. ‘Maintained’ or ‘Enduring’ is better. ‘Misrepresentation’ does not have a hyphen in it."
- "Agreed. ‘lasting’ has a connotation of immutability, whereas ‘sustainable’ suggests that it is adaptable to change with changing requirements."
- "Agree if, in this context, 'sustainable' is taken to mean 'able to be upheld and defended' but 'sustainable' can also mean 'causing little or no damage to the environment and therefore able to continue for a long time' and there is a danger that, given the current focus on sustainability (in an environmental context), the intent of this Principle may be misinterpreted or be confusing. If the term is used, the intent may need to be clarified in the bullet points. 'Lasting' may cause less confusion."
- "The word sustainable has gained great traction in the construction industry and is widely used to an extent that is becoming a cliché and more widely associated with the climate. It does not seem quite appropriate in this heading. Consider ‘Ensure that appropriate systems for oversight and scrutiny are in place?"

- "It was suggested that ‘sustainable’ is perhaps not a word that is typically associated with risk management, and that it needs to be strengthened in this context, for example ‘robust sustainable systems’
- It is suggested that 'and sufficiently independent' be added to the end of the second bullet point" –

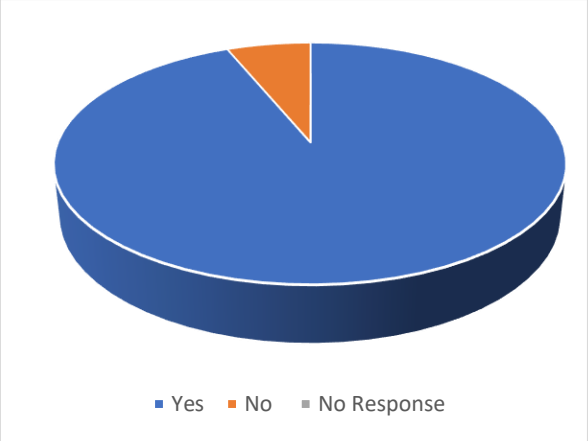
Q4. There are a few new inclusions. Are these helpful?
Introductory wording to clarify the purpose of the material. Is this new inclusion helpful?



Optional comment:

- "Anything which reinforces the message that risk exists and cannot be eliminated but only managed is important."

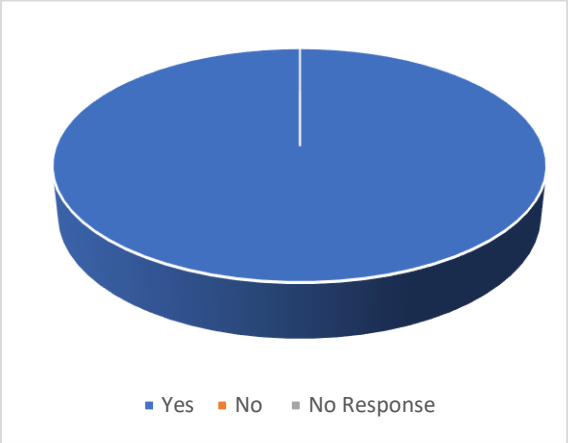
A definition of risk based on ISO 31000. Is this new inclusion helpful?



Optional comment:

- "Acknowledging that the framework is provided as guidance, so alternative methodologies that provide a similar effect could also be used as a framework."
- "Perhaps present in an example risk register, to aid clarity. However, there is a need to make sure that someone considers the bigger picture to understand both the potential knock-on effects of a risk and that someone understands the level of risk for the project a whole. Additionally, structural designers have legal obligations to carry out risk assessments. We are conscious that too often these are done by rote and a good deal of education is required to assist the profession to carry our risk management properly. And this must not be at an academic level. It’s got to be down to earth advice. More explanation (not in this current document) via examples is to be welcomed."
- "The revised guidance appears to have reinvented the ISO 31000 steps in risk management. Is there any reason why the steps set out in the standard cannot be used in their original (or similar) form?
  If the proposed wording is to be retained, evaluation should include an estimate of frequency/probability of a hazard as well as calculation of the risk that results and an analysis against risk criteria.
  What does the dot point ‘Recording and reporting...’ really mean? The intent of this sentence is not clear."

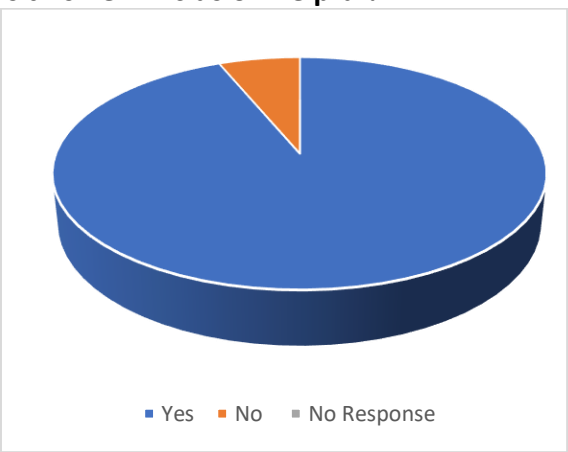
Consideration of the severity/frequency of risk. Is this new inclusion helpful?



Optional comment:

- "This cross maps to the In Plain Sight (Swiss Cheese Model) of risk mitigation"
- "Comment was made by a volunteer that severity is well understood. Frequency being a factor is a good thing to make clear. What is missing Proximity. This is also a factor in determining Severity alongside Frequency."
- "Essential."
- "This probably comes back to Consequence. We often define Risk = hazard x consequences. So, in effect high consequence combined with high hazard probability points to paying real attention and taking proportionate action."
- "This is central to the evaluation of risk. Estimation of frequency is missing and should be part of the evaluation step."

Feeling safe to highlight risk. Is this new inclusion helpful?



Optional comment:

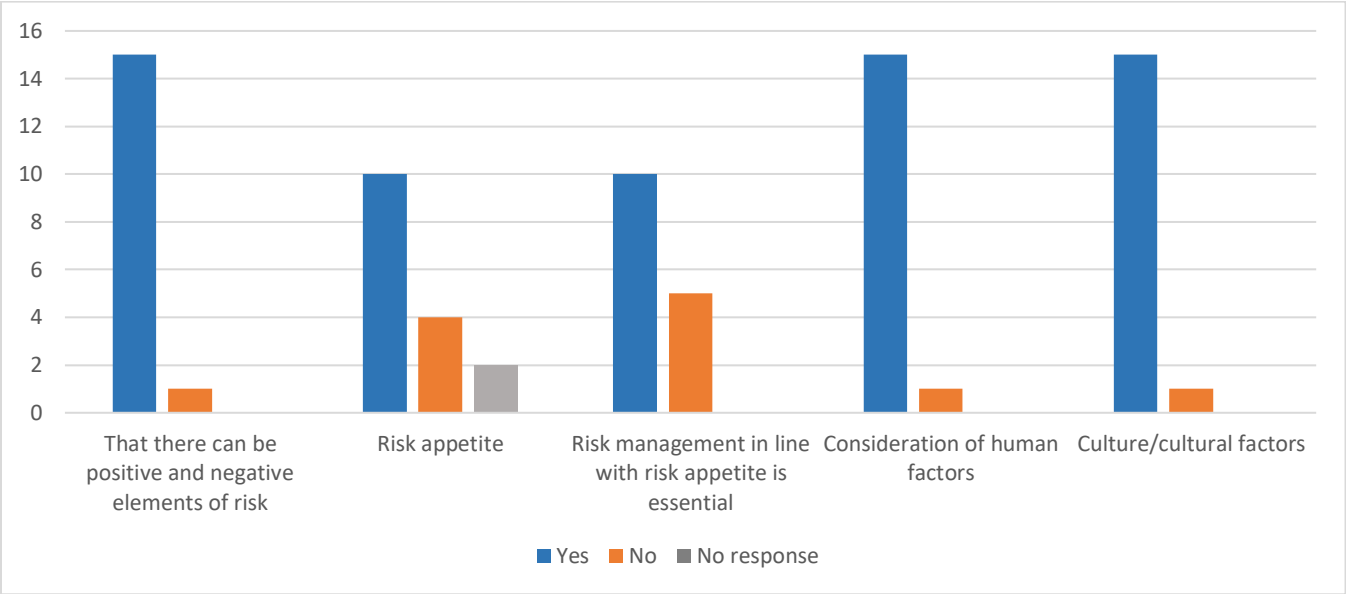
- "This is crucial to an effectively run company – however it does not prevent the engineering concerns from being ignored, to-wit the Boeing 737Max fiasco."
- "Very important that all members feel they have a moral duty/responsibility to highlight risk."
- "Responded as 'yes' although there were mixed views from volunteers who responded to the request for comment."
- "Not sure this conveys meaning."
- "Get people comfortable with the notion that risk exists, we can't eliminate it. So think about it! And don't be backward in making suggestions."
- "This is important, and its inclusion is appropriate.

Principle 4 should ideally highlight the culture that should be in place to encourage reporting, such as a 'no blame' culture to rather than focusing on the negative ones. More detail on what a 'culture assessment' would involve could be included in Principle 5.
The focus on 'Risk Appetite' may undermine the ability of engineers to highlight risk if this is being taken into consideration. Additionally, this is not something engineers should be contending with - it is a manager's job."

(Optional) Could these inclusions be further improved?:

- "Comment was made by volunteers as follows:
- "Detectability" is not defined. If a risk is not detectable, surely it is not a risk. Feeling "safe" in highlighting risk is a strange combination of words… feeling "confident" maybe? Please also refer to the comment on Proximity noted above."
- "The summary of the stages in risk management would be better if it appeared in the section on the role of the engineering professional in risk. The bullet points imply they are a summary of six principles that immediately follow so it is confusing."

Q5. The following concepts are stressed or strengthened. Are these helpful?



(Optional) Could these be further improved?:

- "This is somewhat obvious in that a company avoiding all risks is likely to die. Positive risk is perhaps better explained as taking a business opportunity for growth which involves some risk."
- "Might be helpful to include a succinct example of a positive risk as it is a slightly unquantified statement on page 3 unless I have missed something?"
- "Not sure about the term "appetite". Might indicate that you need to take more risks."
- "Risk appetite - this would be more helpful if there was a counterbalance to the statement on risk aversion stating the potential consequences of excessive risk hunger in terms of human, financial and reputational damage."
- "Rules for the management of safety risks need to be clearly broken out - risk appetite is not really applicable for safety-related risks in many cases. (Putting it another way, engineers should have more power than finance or commercial teams in relation to safety-related risks. The concept of ""positive risk"" sends the wrong message. In reality, we only take risk (all of it ""bad"") to secure positive benefits."
- "1) We don't usually couch risk as positive. But the text is clear elsewhere that there are benefits.
  (2/3) I don't think we would couch it that way in construction. No one expects our structures to fail save perhaps in earthquakes and hurricanes. So, the concept to Risk Appetite is more appropriate in the sense of commercial ventures or innovation.

(4) Bringing any construction project to fruition is a hugely complicated process. Experience tells us that it is rarely technical deficiencies that cause a major failure. Invariably there are some human factors along the way. So, consideration of human factors is vital. We should not say someone might make a mistake. We should know they will make a mistake and the process has to be such as to minimise the risk of that error remaining undetected.

(5) Culture is vital. The culture for us (organisation and personal) has to be that the structure will be safe, and that priority shapes the management of the whole process to assure that safety risks are minimal (to the structure and to the constructors etc)

Additional general comments:

The deeper question is where. For this document to be successful it needs to remain succinct. More detail / examples etc can be given elsewhere. The Royal Academy of Engineers has several booklets on Risk and you might refer to them.

Royal Academy of Engineering: The Risk Debate 'Trust me I'm an engineer' 16th June 2004.

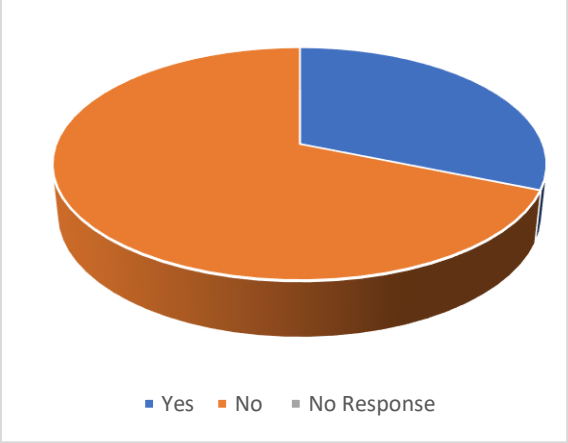
(The RA has numerous publications on engineering risk)

Institution of Structural Engineers: 'Risk in Structural Engineering'. ISE October 2013"

- "The document gives the impression that risk appetite among engineering professional is fixed. Engineers are human as well, so this is very unlikely to be the case. This approach ignores the environmental dilemmas that engineering professionals involved with the environment have to deal with. A classic example being nuclear power which can deliver electricity with a reduced carbon footprint against a waste issue that will be left for future generations to manage for hundreds of years. Our own profession is divided over this issue.
  In addition the references to culture/cultural factors are currently weak, the culture of organisations and society can change. With schemes that are designed to last for 100-years or more, how are you going to assess this?"
- "Members of some of our safety specialist groups have strongly deprecated the introduction of the concept of positive risk, based principally on the importance of Safety, Health & Environment (SHE) aspects of risk management that typically does not admit of positive risk (although examples of it could be conceived of). (See Question 4 Inclusions above). Opponents of the use of positive risk suggest that it should be more clearly explained if it is to be included in the guidance. However, engineers must consider more than SHE in their risk assessment and management, and the concept of positive risk can be considered a useful one."
- "Members of some of our safety specialist groups have strongly deprecated the introduction of and repeated reference to the concept of 'risk appetite'. The argument made is that 'risk appetite' comes from financial markets, is a function of management and should not appear in engineering guidance. The recommendation is that the concept of 'tolerable risk' should instead be used. Perhaps this could be used to clarify the meaning of 'risk appetite' in this context. For example, 'Risk is an inherent part of every engineering activity. Risk management in accordance with risk appetite is an essential part of engineering. Risk appetite must always be moderated by the requirements to comply with relevant legislation as a minimum, in particular the need to maintain SHE risk within tolerable limits.'
- It is not generally accepted by those responding to this consultation that engineers do not have a role in management: quite the reverse, and it is important that engineers be involved in the 'management' decisions regarding the projects they manage. The use of 'risk appetite' therefore remains a point of dispute.
- Human factors are an essential element of risk management.
- Culture/cultural factors. Again, a very important element of risk management. Additional emphasis on encouraging positive culture would be of benefit.
- Improvements. In Principle 2, the statement 'bear in mind that risk assessments should be used as an aid to professional judgement and not as a substitute for it' might usefully be clarified slightly to ensure that it is not interpreted perversely as meaning that "professional judgement can be used to override a RA" (instead of "RA must be used to inform professional judgement"). Since an RA performed badly might mislead an engineer into thinking that something was safe when judgement says it is not, or vice versa, relying entirely on the outcome of an RA is potentially just as dangerous as ignoring it."

Q6

Does your institution have resources (case studies, webinars, etc) to support engineers and technicians about risk that it is able and willing to share, which could be linked from the EngC's supporting webpages?



If you answered 'yes', please provide a brief description and/or a link:
(NB, some answers have been removed to retain the anonymity of contributors)

- "In all ICT-approved training and educational activities (which are provided by third parties), there are sections dedicated to health and safety/risks."
- "We do have several webinars that include discussion of this topic, but not specifically about risk assessment, mitigation and management.
  The one exception is a webinar about a risk assessment approach for resilient positioning, navigation and timing. But the context is quite narrow so may not be that helpful to EngC."

Q7 (Optional) Do you wish to make any further comments?

- "Some of the changes, particularly in the Principles section seem very minor."
- "Good guidance document, no further comment"
- "A volunteer commented that there seems to be an assumption that risk management goes alongside Health and Safety in UK Spec (E2), whereas it is a much broader topic."
- "Management of risk is inherent in policy / process / systems / toolsets / training associated with Obsolescence Management is routinely undertaken by practitioners who are members of IIOM. In general, the approach is consistent with the EC guidance on risk and the international standard BS EN IEC 62402:2019 - Obsolescence management."
- "Well timed upgrade of this document considering the current global situation with risks and management possibilities."
- "The changes proposed to the guidance succeed in making the guide clearer and more useful for engineers and we warmly and fully support the changes."
- "Principle 1 (Apply professional and responsible judgement and take a leadership role) - while it may be implicit in the bullet point ""strive for all those involved to be able to identify potential problems and opportunities"", it is not clear that part of taking a leadership role involves listening to what you are being told and making informed decisions.
- Page numbers would be useful."
- "1. The survey format for comments is not ideal for the communication of carefully considered points on substance - we had to get multiple contributors to download the .pdf of this online form, scan and e-mail responses in and then manually compile to this response! An opportunity to open and share a draft within the Institute and then sign off/submit would be really helpful in future.
  2. The current draft includes, quite rightly in our opinion, the softer aspects of risk management: perceptions, expectations, bias, etc – and largely brings all this together in the term 'risk appetite'. All of

which is good stuff, and effectively communicates the idea that the threshold of acceptability is a variable which depends on time/place/circumstance. One small snag: For safety risks: that does not apply!

Organisations (notably commercial organisations) have the flexibility to take more or less risk – eg, commercial risk, reputational risk, business continuity risk – as their boards decide. This is what is usually meant by the term 'risk appetite'. But they do not have that flexibility with safety risk. HSE requires safety risks to be actively managed down to an ALARP level; and it's noteworthy that the test of ALARPness is 'gross disproportionality' not value for money or break-even point or anything else.
Our considered opinion is that the current draft completely omits this point – and consequently could actually be a bit misleading.

The (now very mature) HSE publication, Reducing Risks Protecting People (R2P2), spells out the requirements for safety risk management in simple, plain, accessible English. It is widely accepted as a definitive reference for best practice. We believe that the EngC guidance document should at least cite R2P2, and preferably repeat some of its main principles.

We consider that the current absence of any reference to R2P2, or to anything tangible (like an exemplar risk register)), makes this latest draft weaker than it could/should be. It is also more difficult, as a result, for those looking for guidance to relate to. We find the way that HSE get lots of pithy content into a document to be quite powerful - a demonstration that this can be quite specific without reference to a specific engineering discipline (indeed, HSE example is > engineering of course).

3. On a separate point, we believe the current draft should be reviewed in relation to one particular piece of English usage: The word "assure" (and derivative forms thereof). It is perhaps noteworthy that this same point has previously exercised other management teams.
This issue centres on 3 words: Insure, Ensure, and Assure. They all sound similar, and the spellings aren't that different, but the meanings are. So, looking at each in turn:

Insure is all about hiring a third-party company to apportion blame, and pay money to injured parties, if and when something goes horribly wrong. In and of itself, it does not make things any safer; and is arguably not the business of engineers.

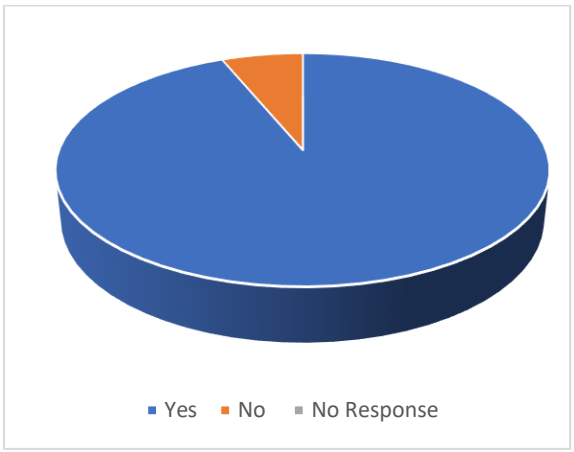
Ensure is all about making sure that what should be done is actually done. This includes activities like training and mentoring, supervision and oversight, cross checking, and independent checks. These are key functions that help to make complex systems safe; and Ensure is very much the business of engineers.

Assure, in contrast, contributes nothing to making the right stuff happen, but gives other people (typically customers) confidence that it has happened. If an organisation majors on Assure without sufficient Ensure in the background, it is, in effect, bluffing. We suspect that EngC would not wish to encourage that in engineers!

Our suggestion for improvement on this point would be to do a global search in the current draft for the word 'assure' (and its derivative forms) and then to review critically whether each instance should be changed to 'ensure'."

- "To note: Point 5 - investigtions SPELLING ERROR (End of first bullet point)"
- "Some mention of concepts such as ALARP (As Low As Reasonably Practical) might be of benefit, perhaps in Principle 3, as it is widely applied in HSE legislation."

Q8 Was this consultation easy to read and understand?


Yes
No
No Response