

Highlighting the Human Factors in Assessing a Crisis and Emergency Plan within the Mining Sector

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Abstract

Assessing crisis and emergency management plans requires some level of judgement by people to determine levels of risk. This 'human factor' can lead to biases when attempting to define levels of risk or what may be deemed acceptable risk. Across many industries including mining the focus on having documented plans is aimed at reducing the workload in the event of an emergency by having pre established frameworks to operate within. In some cases legislation also requires that this process is adopted, with the aims to ensure all potential emergencies are identified and therefore controls established to aid in prevention. Most people have heard the term "to err is human" which highlights the point that people can make poor decisions. These poor decisions can be for a range of reasons, this paper details some of the areas where our judgement can be flawed, not because we are incompetent but rather due to a range of factors in how our mind works. Furthermore individuals can be influenced by groups in their decision processes. We all have differing perceptions of risk and this can impact on achieving acceptable outcomes.

Perception of risk

It has only been in recent years that we have started to understand how people perceive risk. This area of research has come from the field of psychology, an area that is often complex and for very good reason. Primarily an individual's perception of risk is highly subjective and influenced by a range of variables. This is an important field of research and demystifying the psych jargon can assist the non psychologist in gaining a greater understanding and allowing

greater access of the concepts to managers and decision-makers. This issue of measuring risk is also highly influenced by an individuals perception. Ripley (2008) discusses that there is an assumption that "*To measure risk, it was thought, humans simply multiplied the probability of something happening by the consequence of it happening.*"(pg.31) This is further reinforced in the Australian context by such documents as the Australian Standard for Risk Management (1999) which uses a two dimensional risk rating matrix that assesses the level of risk based on the likelihood of a particular scenario eventuating and determining the probable consequence to determine a rating (level of risk). While these types of tools have been around for a long time and have been seen to work effectively they do not always provide an accurate scoring system due to the 'human factor'. These tools provide a guide to help us determine the level of risk and what requires the most urgent action.

Research conducted by the author found significant variation in the application of this type of tool. Using a 4 x 4 risk rating matrix 110 firefighters were asked to assess a particular scenario. All participants were provided with an explanation of how to use the tool and asked to assess the risk. The 4 x 4 matrix provides a possible 16 choices and for the same information participants endorsed 11 separate categories. (Clancy, 2005. Clancy & Holgate, 2005). This serves to highlight that people see things differently and differ in their views of what is a specific level of risk. This also highlights that the tools that are in use are not a means in themselves and there is room for variation in decisions. Other research has shown that there are a number of variables in individuals including education, experience, cultural background, environmental training, how a scenario is framed and age.

(Clancy, 2005. Clancy & Holgate, 2005. Endsley et al, 2000. Reason, 1997. Sadler, Holgate & Clancy., 2007. Slovic, 2000.)

Another area that was found to influence a persons perception of the level of risk, that is to rate it higher than other individuals was whether they had experienced a significant incident. This is had they been in a situation in that type of environment where they felt that their safety had been compromised and were of the belief that they were in imminent danger. In cases where this was identified respondents not only rated risk to a much higher degree, but also were able to identify potential risks across a greater number of categories. (Clancy, 2005). This raises the issue of providing training that is as realistic as possible, however there is still a need to maintain boundaries and ensure that the training is safe and ethical, hazing must be discouraged.

Risk assessment; its nothing new

For a long time now there has been a strong focus on training people to undertake risk assessments, or else they will not know what they are doing. This is not entirely correct, most training focuses on teaching process and often people been told they have not been trained so therefore cannot do risk assessments. Adams (1998) highlights that this thinking is flawed and makes the point that *“Everyone is a true risk expert in the original sense of the word; we have all been trained by practice and experience in the management of risk. Everyone has a valid contribution to make to a discussion of the subject”*. We learn from a young age that if we touch something that is hot it will burn us, therefore we know not to touch hot things when presented with this situation. What have you done? You have assessed the risk and decided that the potential for a negative outcome is too great – that’s a risk assessment.

Risk assessment is about prediction, we are trying to predict what might or might not occur and how severe the results can be. This is an area that can be problematic for us, as without that magic crystal ball, we are never sure, Adams (1995) makes the point that *“The future is uncertain and inexplicably subjective, it does not exist except in the minds of those trying to predict it”*. (pg.30) The risk assessment process often fails to take into

account how we see things and often does not focus sufficiently on whether we have it right. There are many examples of Coronial inquiries where risk assessments were completed, but in themselves were incomplete as they failed to pick up all key aspects associated with the risks. Essentially the risk assessment process is just one component of the overall risk management regime.

Biases

There are many biases we have as humans, and as humans we are wired in ways that leave us open to making mistakes. This is not to suggest that people are poor operators, but rather understanding where things may go wrong in our decision process will greatly assist us when making decisions and determining whether we could do it better. The work of Daniel Kahneman and Amos Tversky in the early 1970’s and 1980’s was revolutionary in understanding the area of human decision making (Ripley, 2008). *“they explained that people rely on emotional shortcuts, called heuristics, to make choices”*. (Ripley, 2008). Heuristics are rules of thumb and as described by Clancy (2005) are essentially “rules of thumb” and *“...are fundamentally useful aids that assist in reducing the complexity of the task...”*(pg.51). Other areas include how a scenario is framed, if it is presented as all doom and gloom it is most likely that people will rate it higher than if it is played down and not presented as an area of concern. There is an exception to this however, where experts work in hazardous environments it has been found that what could be described as expert decision-makers will assess the same scenario presented in two different ways equally. That is, they look at worst case scenarios, in contrast novices were found to have the greatest variability (Sadler, Holgate & Clancy. 2007). There are many other biases such as sunk cost bias, this restricts our ability to pull out of a situation and increases that difficulty, the more we invest in it hoping that things will go right. Confirmation bias provides us with similar problems in that the more we invest the more we dig a hole for ourselves which is difficult to get out of. Optimistic bias is another area where we think things will be alright, it is often difficult to say ‘well we got that wrong lets go back to the drawing board’, but sometimes this is the best way.

What is acceptable risk?

This is by no means an easy area to tackle. Fischhoff, Lichtenstein, Slovic, Derby & Keeney (1981) define acceptable risk as the “risk associated with the most acceptable option in a particular decision problem” (p.3). There will be many competing priorities that can impact, e.g. are there time pressure constraints to make a determination? Who is attempting to define the risks? Managers will have different priorities as compared to the workforce, whereas industrial bodies may have specific objectives that they wish to achieve. Overall it is often difficult to come to an agreement when there are many competing priorities (Holgate & Clancy, 2007).

Group think

This process can greatly assist in reducing the level of variability on defining the level of risk. Where a group of people are able to talk through the issues and priorities this can lead to a dramatic reduction in variability. This was found with the research mentioned earlier on the 4 x 4 matrix? During the research a group of 16 people were put in a room together and given the same scenario and asked to rate it. The difference with this component was that there was a requirement for the group to talk through the issues and determine what the level of risk, as a group they were able to come up with a single rating. This was achieved as the group were able to talk through the issues and raise their views and discuss why they believed what they did. (Clancy, 2005.) This does not always go smoothly and is prone to problems where there are quiet people in the group that are not vocal enough to raise their views or where an individual is overpowering or in some cases intimidating and the attitude is “its my way or the highway.”

A good example of poor group think where management over-ruled decisions and advice was the Challenger Space Shuttle launch decision. The engineers working on the project recommended not to launch as the temperatures predicted on the day were outside any known parameters

experienced to that date. Based on this, management adopted the view that there was insufficient data to stop the launch (the reality was there was no data as this scenario had not occurred). There were a significant number of factors on managements mind, the contract for the fuel boosters had recently come up, the company had never stopped a launch before, the much publicised teacher in space program would potentially see the first teacher in space teaching to empty classrooms, there had been many launch delays and the public and congress were starting to question the amount of funding being spent on a project that was not delivering. The decision was made to launch, engineers were certain that it would end in catastrophic failure and this occurred. (Vaughan, 1996. Perrow, 1999.) As seen in the two examples above group think can be a good or a bad thing depending on a range of issues such as peoples confidence to speak their mind in a group, whether management can veto the majority based on unfounded operational capability requirements.

Conclusion

Planning for the dynamic and unpredictable nature of emergencies creates many challenges for teams assessing crisis and emergency plans. Of particular importance is the issue that we will all see things differently, peoples perceptions of risk vary for a range of reasons. Essentially the human is wired to make mistakes, and these mistakes are not intentional but rather a product of our evolution. Understanding where an individual (or group) may make errors in judgments and decisions helps to provide those with the often difficult task of assessing risk with a pre-cursor to what may be a failure in the process. People do make mistakes for good reason, it is understanding why these mistakes occur that is important.

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