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Psychology of Risk Management

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ABSTRACT

In spite of numerous conceptual and technological developments in risk analysis, risk assessment and management are often perceived and applied on the basis of human psychology — even of personal philosophy — from the viewpoint of the risk assessor, risk manager, safety officer and other staff.

Author examines the psychological factors in the different stages of risk assessment and management, and demonstrates the wide variations of interpretations and responses that can occur in real-life, as well as their potential consequences. Although individuals can be most influenced by psychological impacts, risk assessment teams may also fall into the same trap.

Psychological influences start from risk perception, with the same hazard ranging in various observers' minds from the trivial to the catastrophic. Data collection for risk assessment or accident investigation is also quite subjective, its scope and detail varying widely with the assessor.

Many variations occur in the determination of levels of hazard likelihood and severity. Depending on the background of the assessor and overt or perceived time and cost pressures from management, levels may vary over a wide range. Likewise, combination of risk from its component factors, and categorisation into groups for control are also often subjective decisions, with long-term and far-reaching consequences. Finally, the recommended controls for various risks are also often based on non-scientific considerations.

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Introduction

It has been long recognised that risk assessment and management are quite subjective processes, even in today's automated and computerised environment. With human wellness and lives at stake, a lot of risk assessment carried out in many workplaces is often based on a cookie-cutter approach, just filling in blanks on a form, with the dangerous twist that the mostly subjective data is also input and evaluated based on precedent and expediency rather than by a case-by-case check in open-minded competence. Consequently, much of the assessments and controls that come out of businesses and industries is stereotyped, with little innovation or customisation. Understanding risk psychology would remove the mystique and reduce the subjectivity of risk assessment, and facilitate specific solutions to complex problems of today's fast changing environments.

Behaviour-Based Safety has of course contributed considerably to the analysis and application of worker psychology to reduce accidents. But BBS addresses only one facet of the total problem. Human psychology on the other hand operates at every level in every endeavour, and all the more so in areas like risk management which happens to be quite subjective in many respects.

Risk management generally consists of the three stages: 1. Hazard identification, 2. Risk assessment from contributing parameters, and 3. Risk control, together with preparation before and follow-up after. All of these phases involve communication between people and funds and resources to implement the various procedures and actions. Thus, psychology is an unavoidable part and parcel of risk management.

Risk Psychology

Risk psychology has been defined as the branch of psychology that addresses our perceptions, attitudes, decisions and behaviours towards risk and how we handle risks. Schneier (ref 1, expanded essay) identifies four key areas of risk psychology as follows:

1. Behavioural economics, sometimes called behavioural finance, involving human biases – emotional, social, and cognitive – and how they affect economic decisions.
2. Psychology of decision-making, and more specifically 'bounded rationality', which examines how we make decisions, in terms of economic risk.
   Both these fields go a long way to explain the divergence between the feeling and the reality of security and, more importantly, where that divergence comes from.
3. Actual psychology of risk, covering risk perception, trying to figure out when we exaggerate risks and when we downplay them.
4. Neuroscience, how we think both intellectually and emotionally. Over the millennia, our brains have developed complex mechanisms to deal with threats. Understanding how our brains work, and how they fail, is critical to understanding the feeling of security.

Author deals mainly with the first three topics, leaving the fourth to medical experts.

According to Andreasson (ref. 2) research on psychology of risk has centred on how people may be biased by various social influences, by the way that they perceive the choices available, or by the cognitive rules of thumb that they use to simplify difficult decisions.

The field of risk psychology is vast and well-established. There are professional bodies dedicated to this subject, journals exclusively for it, and experts solely to deal with it. The author makes no claim to either offering new ideas on the topic or to deal with it exhaustively in this paper.

What he hopes to cover herein is a review of the scope and reach of human psychology into the matter of risk identification, assessment, and control, and discussion of certain major characteristics of some vital psychological aspects of risk from an industry-player's viewpoint, in the hope that it may help risk management practitioners develop better understanding of information and more confidence in action.

Importance of Risk Psychology in Risk Management

While the importance of risk assessment and management has been recognized in advanced countries around the world and their practice has been implemented for many decades, in countries where it is just being introduced, practitioners are not too familiar with their psychological foundations and implications.

Often, unfamiliarity with or ignoring risk psychology adversely affects our decision-making and causes adverse consequences such as increasing deficiency of knowledge, dependence on others (including 'experts', about the significance of whose opinions new concerns are being raised!), lack of flexibility and objectivity, and even when all the evidence is in , delay in taking decisions, or failure to take action.

Further, it has been clearly identified that without a proper understanding of the psychology of risk, people's opinions are often polarized drastically, leading to:

- Non-conformance to regulations
- Inadequate communication between stakeholders
- Inadequate and wrong interpretation of causes and consequences
- Insufficient funding for safety measures
- Incomplete and wrong accident investigation
- All of the above adding up to increase in accidents and fatalities

Is risk worth worrying about? Like birth and death, risk may be an inevitable part of life, but must be contained within bounds. Risk can and must be identified and controlled to establish human survival if not dominance on earth. But all risk cannot be eliminated or even controlled, on practical considerations.

For instance: Could the 2001 terrorist attack on the New York World Trading Center (WTC) have been managed with more logical foresight and less drastic consequences?

To dispel a common misconception, WTC had indeed been designed for an airplane hit (ref. 3), to handle the obvious risk of a plane losing control while landing at one of the three airports around New York. The plane (Boeing 707) that was used in the impact design was purportedly of nearly the same weight and speed class as the planes (Boeing 767) that hit the twin towers. But the planned intensity of the terrorist attack, and the escalating effects of the jet fuel burn in the lift shafts, could not have been predicted.
The real question is whether anything could have been done to avoid such extreme consequences even if the risk had been known in advance. The answer is that complete avoidance would have been unrealistic.
Risk management decision often is not a matter of theoretical capability but practical feasibility, that is to say affordability – which is again a psychological judgment, individual or organisational or governmental as the case may be. ALARP, "As Low As Reasonably Practicable", a benchmark for safety management in UK, is very apropos in this context, as much as to say, "Even a prince can only do his best!"

What is 'reasonably practicable'? Simply what one's capabilities and resources can handle, no more, no less. This standard cannot be absolute; it can only be relative. Each individual whether for himself – male nouns and pronouns hereinafter also referring to females unless specifically defined – or for his committee, his organisation, or his country, should decide where the line lies, beyond which risk cannot be handled and the only recourse is to face it or avoid it.

That is why, when the author addresses CEO-s he looks them in the eye and asks: "How many of your workers will be exposed to death during the coming year?" This shocks them no end, but it is just the flipside of the question: "How many workers will be saved from death during the coming year?" and much more gut-wrenching. He hopes this will loosen some purse strings for risk management.

When a commander sends his troops into war, he may decide by coolly moving markers on a table model or a computer screen. When a committee decides which out of seven equally deserving patients will receive the single kidney available for transplantation, the members cannot weep for the other six. But when a management decides the fate of its workers, the psychology of decision-making cannot be and need not be so unemotional or 'philosophical', if only because alternatives are available, such as elimination of the risk, substitution of a less risky product or process for the more risky ones, and so on.

Zero accidents, zero fatalities, may be unattainable, but like ideal love or nirvana, a worthwhile goal to strive for always and in all ways – ever within the limits of our strengths and resources. 'Risk tolerance', namely how much risk impact can be accepted by management, is also a psychological argument.

The Precautionary Principle: Who hasn't heard the old and perhaps out-dated dicta: "Better safe than sorry", "An ounce of prevention is better than a pound of cure", "Penny-wise and pound-foolish", etc.?

They still thrive in the risk management domain as the 'Precautionary Principle', which simply stated (ref. 4) is: "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation" – "or major human harm", author will add, to make it relevant here.

As example, let us consider the widely adopted practice of turning cell phones off at petrol stations. The truth of the matter is that not only is there no conclusive data about cell phones setting off petrol fires, but also could not serious investigators (including Discovery Channel's 'MythBusters' Savage and Hyneman) confirm such a possibility let alone probability! Here, the precautionary principle should apply thus:
Question 1: Is the mishap possible? Yes, petrol – even its gas – is highly flammable, and a spark can conceivably torch it. But likelihood: Miniscule, almost non-existent. So why bother?

Question 2: What will be the impact? When a petrol station goes on fire, the conflagration will be a fireball of mini-nuclear proportions, enough to destroy the township around. Severity: Very, very high.
Question 3: What would it take to eliminate this risk? Simply turn off the cell phone, do not use it within the confines of the petrol station. Control: Feasible, simple.
Question 4: What will be the control costs? Short-term, minor inconvenience. Cost: Very cost-effective.
So then, impose the control, never mind it may happen only once in a million, or in a billion times!

On a construction site, how many have died from suspension trauma? Maybe not as many as directly falling from heights. But controlled research studies have produced highly statistically significant results (ref. 5) and only by pro-actively applying findings to preventive measures have kept the fatalities low.
Question 1: Is the mishap possible? Yes, occurs frequently. Likelihood: Low to medium.
Question 2: What will be the impact? Death. Severity: Very, very high.
Question 3: What would it take to eliminate this risk? The mishap victim stepping on to loops at his feet. Special training for workers and supervisors. Control: Feasible, simple.
Question 4: What will be the control costs? Medium for training and commercial stirrups. Low for toolbox briefings and ordinary ropes with loops for the feet at ends.
So then, impose the control before more people die, never mind it is very rare and isn't widely known.

Perception of Risk

People usually perceive risks as negligible, acceptable, tolerable, or unacceptable, and compare them with the benefits, which should ideally outweigh the risk by a significant margin. Schneier (ref. 1) summarises factors that influence people to exaggerate or downplay risks as follows:

Exaggerated Risks	Downplayed Risks
Spectacular	Pedestrian
Rare	Common
Personified	More under control
Externally imposed	Taken willingly
Talked about	Not discussed
Intentional or man-made	Natural
Immediate	Long-term or diffuse
Sudden	Evolving slowly over time
Affecting them personally	Affecting others
New and unfamiliar	Familiar
Uncertain	Well understood
Directed against their children	Directed toward themselves
Morally offensive	Morally desirable
Entirely without redeeming features	Associated with some ancillary benefit
Not like their current situation	Like their current situation

Risk perceptions generally depend also on people's age, sex, cultural and educational backgrounds. Some of the dominant factors from common lists are as follows:

(a) Age: Many young people (especially in the occidental peoples) find the risk of sky diving or other adventure sports as acceptable, even inviting. To the older generations these would seem too dangerous and, therefore, unacceptable.

(b) Nature of the Risk: Following pairs of characteristics of a situation generally affect risk perception, with the first factor in the pair tending to increase perceived risk, and the second tending to decrease it:

- Involuntary vs. voluntary exposure: Exposure to electromagnetic radiation is often involuntary. Use of cell phones and smoking are two examples of voluntary exposure, although with very different severity levels. Many communities are taking steps to eliminate or reduce involuntary passive smoking.
- Lack of personal control vs. feeling of control over a situation: (Similar to the previous.) Many prefer driving to flying, for this reason.
- Familiar vs. unfamiliar: Familiarity with the situation, or a feeling of understanding of the technology,

reduces the level of the perceived risk. Automobile travel as against airplane travel is an example.

- Insufficient vs. sufficient scientific information: [or, Known vs. Unknown] Once the doctor explains a surgical procedure, patient is more at ease. An adult knows the dangers of electricity, a child wouldn't.
- Dreaded vs. not dreaded: Some diseases and health conditions, such as cancer, and severe and lingering disability, are more feared than others, in subjective reaction to situations. Nuclear bomb is an example.

- Unfair vs. fair: If people are exposed to the electric and magnetic fields from a high voltage transmission line that does not provide power to their community, they consider it unfair.
- Permitted vs. punished: People believe that what is permitted is safe while what is punished is dangerous – although the reverse may be true. Cigarettes and marijuana are often cited as an example.

(c) Exposure: Refers to actual quantitative risk level. We tend to ignore something we are exposed to all the time, such as crossing a traffic junction. Japanese accept earthquakes as part of their life.

(d) Preventability: The degree to which the hazard is perceived as controllable or its effects preventable. Flu vaccinations have eliminated the fear of the disease.

(e) Frequency: There is a general tendency in fairly well-informed subject groups to over-estimate the incidence of rare causes of death and underestimate the frequency of the more common ones. For instance, in the USA, 45,000 people die annually in traffic accidents, without raising a fuss at the social or governmental levels. But a few thousands dying in a war cause a national crisis.

Example: A nuclear power station may be perceived as a high risk by neighbouring communities who are not receiving any benefit from it, for the following reasons:

- People are faced with an involuntary exposure to any radiation;
- There is a lack of control over the siting and operation of the facility;
- Nuclear technology is unfamiliar and incomprehensible to most people;
- There is insufficient scientific information to precisely assess health risks;
- There is a likelihood that this could cause a dreaded disease such as cancer; and,
- It is unfair because the installation exposes the non-benefiting community to radiation.

On the other hand, if it is built with Government approval, it may (should?) be alright to stay on.

Attitudes to Risk

Apart from individual risk perceptions, all around the world, and acknowledged in democratic nations, the differences in the attitudes to risk between the various stakeholders in a project are real and drastic.

- To the management, risk is far removed on a personal level, and the cold statistics of accidents and their impacts have of necessity to be balanced against the even more frigid fact of financial survival.
- To the workers, their foremen and supervisors, on-site risk is an inevitable reality of hard work and danger which they face all the time, and mistakes whether by unsafe acts done by the people or from unsafe conditions set by the management, can be quite harmful and often fatal.
- Engineers and line personnel are caught between twin fires of safety and economy, relentlessly driven by pressure to keep the project moving ahead, always behind, always catching up, always patching up.

It is a major effort to bring these opposing forces into harmony and alignment. Many hurdles present themselves in the perception of the nature and significance of risk in the project, in the assessment and control of it, and most of all in the communication and decision on the information about it.

Data Collection: Attitudes can affect data collection for risk assessment and management. If managers start with the opinion that it is always the careless or stupid worker who causes the accident by not turning the nut fully or not wearing the chin strap, then data collection is limited to noting date, time and whether he had been trained for his task – and since the answer is invariably 'yes', there ends the matter.

No matter that the nut jammed because it was the wrong size. Or that his helmet's chin strap could not be adjusted for his jowls. Or that he had had heavy anti-histamine medication the day before for his cold. Or that there had been no supervisor overseeing such important tasks. Or simply that he had not followed –

or been absent for – that part of his course, and he passed with the minimum 70%.

The same is true with accident investigation. Many safety officers really believe that they 'know' how an accident happened, and the investigation is a mere formality. Consultants (author included) have a hard time convincing clients that detailed data collection is an absolute necessity for improvement of safety.

Business Case for Safety

A very common perception among the business community is that investment in safety to eliminate or mitigate risk is generally a legal imperative, at best a concession to humanity and at worst money down the drain. Safety managers have the perennial problem of asking for more like Oliver Twist and being deprived likewise. Risk assessment teams are under constant – implicit if not explicit – pressure to review the risk levels with a view to downgrade them so that the companies may go ahead with the work.

The myth is that safety is a financial burden and reduces productivity, while the truth is that when properly applied, risk management saves lives and saves money. Risk assessors will do well to present their plea for funds from the management in terms of business advantage, which too is well documented. A classic example is when for lack of safety goggles costing $10 a worker gets injured in the eye, and the company ends up having to do $120,000 worth of business to make up the total costs!

Communication

The importance of communication, especially the far-reaching impact of communication on the explanation of risks and the motivation to adopt safeguards against them is often not appreciated. In the words of Rohrmann (ref. 6), "Informing and communicating about risks is more likely to succeed when treated as a two-way process, when participants are seen as legitimate partners, and when people's attitudes and 'worldviews' regarding environment and technology are respected."

This may be analysed on three fronts:

(a) Lack of knowledge of the primary language;
(b) Insufficient information shared with the personnel involved; and,
(c) Phraseology in documents

(a) Lack of Knowledge of the Primary Language: It took USA years of worsening construction accident statistics to recognise the problem with the influx of Mexicans (Chicano-Latino) from south of the border, namely the lack of understanding and actual misunderstanding of regulations and safe work practices by the new immigrants unfamiliar with (American) English.

Of course, once the problem was identified, industry leaders and authorities devised and implemented measures to build communication bridges between the newcomers and natives to the extent that construction supervisors now have to pass a Spanish test as part of their mandatory training.

In Singapore, as more immigrant workers and supervisors enter from many different regions, training courses are given and signs and brochures are done up in languages apart from the four official languages English, Mandarin, Malay, and Tamil. Yet, from his experience with training supervisors and investigating accidents, author feels that insufficient language familiarity could still be a weak link in the communication and implementation of safe work procedures by both supervisors and workers.

(b) Insufficient Information Shared with the Personnel Involved: Old style management treated workers as low-level employees who did not need to know all the details of the reasons for or safety implications of the orders they were carrying out. The new style uses a more participatory approach.

One of the unexpected discoveries from the U.S. investigation was that more than the terminology and the safe work procedures, that is the 'what' and the 'how', what worked best to motivate the workers towards

increased safety was the technical explanation of 'why' the safeguards had to be adopted, in other words, the consequences of the violations, especially at the personal, family, social and cultural levels.

Does the worker know that if he bent and picked up a 50kg cement bag from the floor, his spine would be subjected to a force of about 1200 kg, more than the bone was designed by nature to bear on a routine basis ... and does he know that he can and should refuse to carry such a load? Does the supervisor also know these, and that he must provide the worker with a dolly to move the bags around, and a second worker to help the first one lift the cement bag on to and off the cart?

Does the foreman know that when a worker has fallen from the scaffold and is dangling at the end of a cable in his full body harness, suspension trauma by way of venous pooling may kill the dangling worker if he is not rescued within about half an hour? Even if he does, does he then know he can save him by dropping him two lengths of rope with loops at the ends for him to put his feet into?

Do the workers know why a chin strap is critical under certain circumstances? Do supervisors know about emergency preparedness measures? Do managers know when and when not to provide full body harness?

All this and more are in the books, presented at training sessions, and supposedly known to one and all. In practice however, much of it is 'hit or miss' depending on the background of employer and employee and on the empathy between them.

Much of the communication in these circumstances must be realigned to get to the heart of the matter – and to the hearts of the people involved. In a multi-ethnic country with many languages, extra care and effort must be taken to spread risk awareness through all ranks of the workforce in their lingo and idiom.

(c) Incident Reporting: A related issue in communication is the hesitation of almost all stakeholders in a project to document and report 'incidents', referring to near-misses or close calls in the workplace. Common excuses are: Nobody got hurt and there was no major damage anyway; it takes unnecessary time and paperwork; it is personally and professionally embarrassing; and so on. Psychologically this is all very human, but safety-wise it is very short-sighted and potentially dangerous.

It is well known that for every accident there would have been many incidents (numbering in scores to hundreds depending on source) which, if only the participants had reported them and officials had acted on them, might just have prevented. Singapore now has a strict Incident-Reporting Regulation; the management must encourage all personnel – and also set an example – in the documentation of incidents.

(d) Phraseology in Documents: Author has addressed what he calls the "tyranny of terminology" elsewhere, particularly in his other paper in this same volume (ref. 7). Lower echelon staff would prefer to make ticks on check-lists than write words. Management and line personnel too forget to whom they are addressing their reports and memos, and couch their words in language not suited to their readership.

"It will be contingent on all concerned to circumvent catastrophic hazards through controls in a precise hierarchy" is certainly correct and quite impressive. But "All staff should avoid high risks by safeguards according to the approved sequence of effectiveness" will be more friendly and less confusing!

Likewise, phrasing of options can affect outcomes, knowingly or unknowingly. A likelihood example may be: Between "This device will save 1 out of 5 victims from a fall." vs. "This device will not help 4 out of 5 from a fall." most people will prefer the first option, though both options are exactly same.

Further, it has been conclusively proved that the way a question or statement is presented can elicit a particular desired – or unexpected – response. For instance, consider the choices (ref. 8): "A – Sure gain of £240; B – 25% chance of gaining £1000 and a 75% chance to gain nothing." Most people are able to work out that the expected return of option B is higher than A (by £10), but the uncertainty of option B means they are prepared to pay a risk premium of £10 and choose option A. This is a robust finding from economic psychology and behavioural economics: When offered a choice between two gains, we prefer the 'sure thing' over the risky option. We are 'risk averse'.

But, consider the following choice between options C & D: "C – Sure loss of £750; D – 75% chance to

lose £1000 & 25% chance to lose nothing." If people were choosing on the basis of the expected values of the two options (both £750) then we would expect equal proportions to choose each option; however, most people choose option D. [There is also a blindness to value differences, as reference 8 explains.]

When two options are phrased as losses, people prefer to take the risky option rather than settle for a sure loss. In the words of Mitchell (ref.8), "This tendency to be risk prone in the face of losses keeps casinos in business and results in the downfall of major banks through the activities of one rogue trader."

Group Dynamics in Risk Assessment

To avoid individual blind-spots, ignorance, or bias (if not outright prejudice) influencing the identification of hazards and the assessment of their likelihood or severity levels, a team is recommended. Teams pool the expertise and experience of individuals, and also provide a forum to clarify doubts, discuss controversial issues, and arrive at a consensus. Team recommendations also carry more weight than an individual's opinion with the management. At the same time, the group dynamics of teams may also tend to vitiate the value and integrity of outcomes.

Company Culture: For instance, if the company culture has tended to downgrade certain hazards like climbing ladders, then the team will also reflect this attitude. If the company is well endowed and the management encourages giving the workers 'the best', then everyone will be issued an expensive body harness regardless of whether the task needs a fall arrest or a work restraint – which latter needs only a waist belt and a lanyard, and is less costly to the company and less troublesome to the worker.

Frank Expression: Another tendency of groups where members do not have the courage of their convictions and/or do not wish to speak out frankly is that the minority with a different opinion from the majority abstains or votes with the majority when identifying hazards or assessing likelihood and severity levels to determine risk category for further control. Consequently, it may well happen that certain serious hazards go unidentified and some risks do not get controlled as well as they should be.

Outcomes from group dynamics are shaped by the collective psychology of the participants, and the individual psychology of the group leader. Depending on personal introversion and cultural orientation, unhealthy conformity or authoritarianism may result. Members may press for their own agendas, but in the end, nobody may end up assuming responsibility. These tendencies must be curbed by special effort.

Taking the Easy Way Out: Human psychology drives people to wishfully think away risks especially when time and money pressures threaten from the wings. Very often risk assessors try (and may unfortunately succeed) in forcing all identified risks to the lowest possible level with or without proper safeguards. As author has explained in detail in his book (ref. 9) this cop-out option will increase the risk.

For, firstly all risks cannot be reduced to the lowest 'acceptable' level within the available resources. Secondly it may not even be desirable to reduce all risks to low level because then there would be no need to impose any further safeguards; complacency will set in, lulling supervisors and foremen into a false sense of security. This is known as a state of 'denial' of real danger, and may lead to potential disaster.

Unsafe Acts or Unsafe Conditions: Psychological conflict can surface in assigning accountability ('blame'?) for mishaps, whether to unsafe acts by workers and executives, or to unsafe situations created/permitted by management and senior policy makers. Obviously, the pursuit of truth may be vitiated by vested interests from both ends. It takes sound psychological understanding and mature psychological decision-making to avoid hasty or untenable conclusions.

Safety Culture

To most personnel, particularly in risk management, safety prevention is a necessary evil, like going to the toilet, rather than a normal part of the plan with reasonable benefits, like having breakfast. If this attitude persists and is propagated down the chain of command, it will only make the safety management system a hypocritical farce with far-reaching risk potential.

The chain of management-executives-workers must be closed into a circle, with management accepting workers not only as a valuable employee but also as an essential partner, low-paid though workers may be. In fact, managers and senior staff would do well to re-examine their definition of the word 'family'. If by that word one means a human being for whose food, shelter, and well-being he is responsible, then workers are his family at the workplace, junior and perhaps naïve members no doubt, but 'family' nevertheless. Once conceded and accepted, the concern and the follow-up become spontaneous.

The preceding should serve to highlight the oft-repeated but little understood phrase, 'safety culture'.

Safety culture is not a fad or a slogan. As author has explained (ref. 9) safety culture is:

- Covering up clothes-drying pole holder pipes when not in use, to prevent dengue mosquito breeding;
- Picking up a banana peel in your path and dropping it into a dust bin rather than just stepping around it – thus saving a pregnant wife or a doddering grandfather a few steps behind you from slipping on it;
- Taking seriously posters and videos, recommendations and warnings, that authorities provide for safety – and acting on them;
- Reporting any missing scaffold planks at a worksite, unattended baggage at MRTs, and violation of safety norms anywhere, whether you are directly affected by the problem or not;
- Learning more about what can cause harm, who can be hurt, and how every one of us can help all of us avoid it – and to that end, making a habit of seeing, hearing, feeling, and understanding better, so that we may catch signs of danger and do something about them; and,
- Stopping workers from using cell-phones when on the job;
- Warning workers, the very <u>first</u> time they ignore any rule, that they will be dismissed if caught again.
- Getting up the courage to stop young kids from jumping around on escalators, to point out a 'non-smoking' sign to a smoker at a bus stop, to report incidents on the job and violations off the job, and to do such other simple risk mitigation acts.

Safety culture is thus rectifying a situation which can cause harm to others, even if not to ourselves. Safety culture is proactive concern about the safety of others as much as our own. It should be consciously practised until it becomes a way of life.

<u>The 5A-Way to Safety</u>

To bring safety culture from the pinnacles of dreams down to the plains of deeds, author presents a favourite five-finger exercise of his own, which he has developed over the years as a self-assessment technique for resolution of complex situations in his professional and personal life. In formulating this '5A-Way', he stands on the shoulders of many all-time greats such as Socrates, Confucius, and Gandhi.

His '5A-Way to Safety' extends the technique as a psychological thought process to promote safety culture, (ref. 10). Themes of the 5A-Way are shown in Fig. 1 – graphics courtesy of Singapore Ministry of Manpower based on author's ideas – and will be elaborated in following sections.

Figure 1 – The 5A-Way to Safety

<u>(A-1) Attitude is Everything:</u> It is the beginning, the foundation for all we want to do. In safety, it means that we want every one of the workers who comes to work in the morning to return home in the evening, safe and sound. It means that we wish to share with our cohorts, information and knowledge about accidents and incidents. So that each of us can deeply believe, and proudly proclaim: "I accept work-place safety as a core value!"

<u>(A-2) Awareness is Knowing Enough:</u> It is knowing all that is going on around us. In safety, it means we must learn what can cause harm, to whom, with what impact. It means that we must see the potential

dangers, hear and sense them ... to identify them, so that we can avoid or control them. To save employees from injury or death, to save our property from damage, and our environment and reputation from harm.

(A-3) Acceptance is Owning Risk: It is being proactive, taking the initiative and responsibility. In safety, it means being accountable for the welfare and safety of all the stakeholders. It means treating all stakeholders as partners, committing ourselves to the actions and their consequences. To make risk management our vision and our mission, and to declare their content and our intent to all concerned.

(A-4) Analysis is Planning: It is developing the right procedures, selecting the right tools. In safety, it means identifying the hazards, estimating the likelihood and severity of accidents, and their combined risk level. It means deciding which risks are acceptable, which are unacceptable, and thus, which are tolerable. So that we can plan to manage them, by elimination or mitigation by suitable safeguards.

(A-5) Action is Implementation: It is putting our money and our effort where our mouth is. In safety, it means getting all the stakeholders to understand, accept, and participate in the risk assessment and management process. It means documenting all relevant information, implementing our decisions, and communicating with all concerned. So that we may get on with the business of safety, and the safety of our business ... proving that safety first means that safety lasts.

Application to Risk Management: Management may view risk analysis by the 5A-Way as follows:

A1. Attitude	:	Workers are our family at the workplace. Ensuring their workplace safety is to both their and our benefit.
A2. Awareness	:	Risk assessment is now a pre-requisite to workplace safety. It is both a legal and a professional requirement.
A3. Acceptance	:	We accept the responsibility for workplace safety, and declare our commitment to enabling and enforcing it.
A4. Analysis	:	We get a thorough risk assessment done to identify hazards and assess risks. We determine all necessary controls.
A5. Action	:	We implement all recommendations of risk assessment team, consistent with our goals. We assist and empower all concerned.

Conclusion

This paper has barely scratched the surface of risk psychology, and even what has been presented may be only the very basic, non-controversial aspects of it. The author has strived only to alert the stakeholders in the field of risk management to the importance of human psychology in practical decision-making and implementation. He has not ventured into the theoretical or medical aspects of the science, leaving it to the experts – it is complicated enough to digest risk psychology down to layman's or engineer's terms!

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