

## **Concept of Dynamic Risk Assessment: Does it Apply Everywhere?**

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### **Hazard Identification and Risk Assessment – Fundamentals of Safety**

A Job Safety Analysis, a Workplace Risk Assessment...whatever we call it, it is about identifying the hazards and assessing the risks so that you can implement suitable controls. These are the basics or fundamentals of safety. But what happens when work activities involve fluid activities or environments where individual workers need to make quick mental assessments and manage risks "on the fly"? This is where dynamic risk-assessment concepts come in to play.



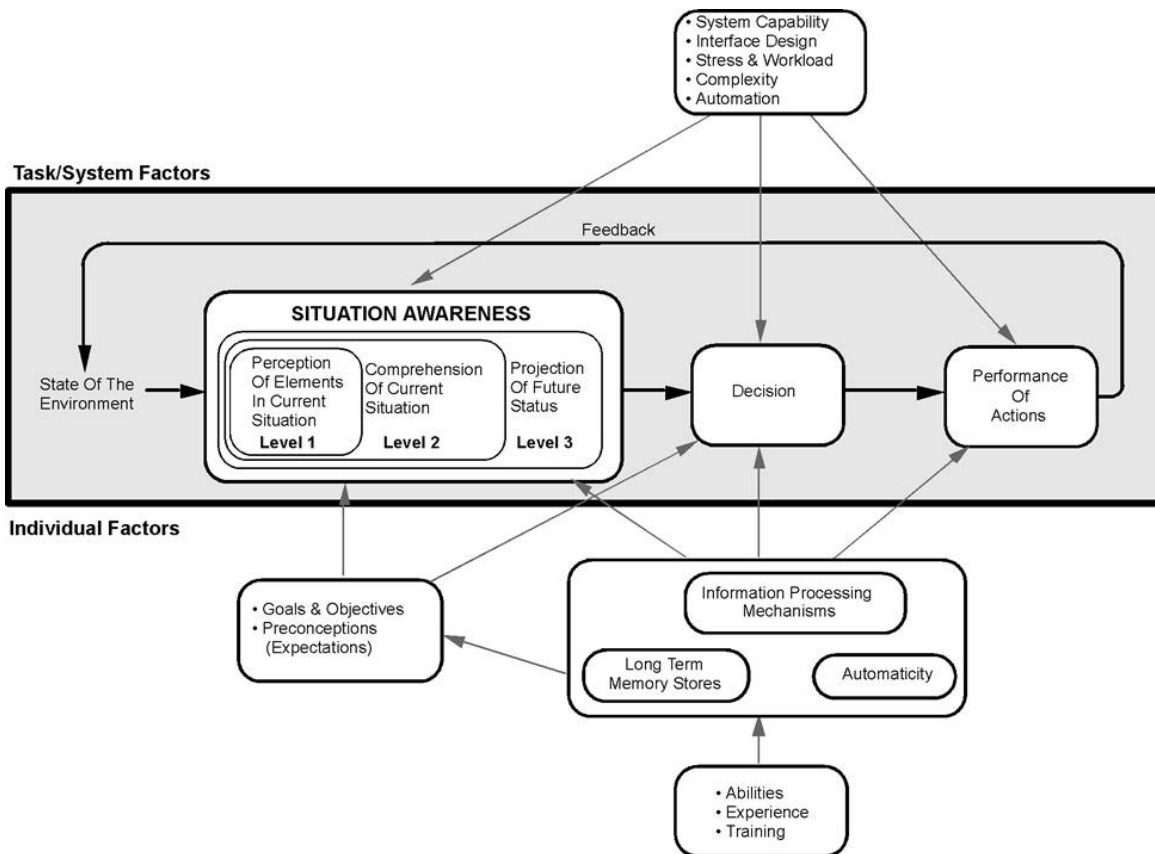
My oldest son is a police officer and on April 22, 2010, he was awarded the Chiefs award of Excellence for Bravery, as he saved an individual's life, risking his own. For those of you who are parents, you may understand how this has troubled me somewhat. I had mixed emotions the day of the actual incident when he told me what had happened and then again at the awards ceremony. My son risked his life to save another. The community and I are proud that he did the right thing, but he risked his life. As a safety professional and as his mom, I needed to sit back and think about that.

I deliberated over the concepts of hazards and risk in my head and realized that you cannot make things 100% hazard or risk free. For every occupation, there is a line of reasonable risk as you perform the job. When the reasonable risk shifts to an unreasonable level, you simply don't do it, or is it "time to put on the big boys' pants and earn the pay"? As safety professionals we assist organizations to proactively manage predictable risk. This must be balanced with the provision of knowledge and the development of skills to adapt in a dynamic manner. I realized that, for most occupations, and especially those in the emergency services, that Dynamic Risk Assessment is a key skill that is necessary.

Dynamic risk assessment is a methodology that allows people to make good-quality decisions in rapidly changing and often ambiguous situations. When the existing processes are no longer appropriate or sufficient, there needs to be an alternative approach, and a dynamic risk assessment provides a means for people to make safe decisions. People need to be trained to assess situations both confidently and competently. Dynamic risk assessment must not be used as an excuse for making instant decisions that are not part of the process. Dynamic risk assessment is commonly used to describe a process of a risk assessment carried out in a changing or evolving environment, where the task being assessed is evolving as the process itself is being undertaken. In the case of emergency services, members are frequently

confronted with competing or conflicting incident priorities and additional demands or distractions when completing the task. The focus becomes evaluation of the risks effectively and making informed, confident decisions during all phases of an incident, as my son demonstrated in the management of his particular event. Situation Awareness (SA) involves being aware of what is happening around you to understand how information, events, and your own actions will impact operational goals and objectives, both now and in the near future. Lacking situation awareness or having inadequate information has been identified as one of the primary factors in accidents attributed to human error (Hartel, Smith, & Prince, 1991) (Nullmeyer, Stella, Montijo, & Harden, 2005). Situation awareness becomes especially important in work-related domains where the information flow can be quite high and poor decisions can lead to serious consequences. The organisational culture must be that everyone is observing, thinking, and discussing the situation constantly. It's all about implementing effective human performance tools; perceptions versus reality, expectations versus realization, comprehension and forecasting, informed decision making and calculated and formulated risk.

It is not only about being “aware,” but understanding and assessing what you see and then projecting the future status outcome where an appropriate decision must be made, and then the performance of the action can be implemented.



**Endsley's model of situation awareness (adapted from Endsley, 1995).**

Dynamic risk assessment is sometimes regarded as a separate topic rather than an integral part of good risk management systems. The situation may be dynamic but the risks, while transitory, are predictable from experience and from the Proactive Safety Analysis. Risk assessment is an analysis and evaluation of a hazard. The only thing that changes is whether you are carrying out the assessment in

advance or at the time of exposure. When competent people consider dynamic situations—most of which they have had experience of at some time—the risk they may face has a high degree of predictability. Therefore training of individuals to adapt to risks in changing environments must be part of the instructional program and a component of assignment of tasks.

### Some Steps to Think about within the Whole Hazard and Risk Analysis Process:

- Evaluate the situation: Consider issues such as what operational intelligence is available, who has this information, what tasks need to be carried out, what are the hazards, what and where are the risks, who is likely to be affected, what resources are available?
- Select systems of work: Consider the possible systems of work and choose the most appropriate. The starting point must be procedures that have been agreed upon in pre-planning and training. Ensure that personnel are competent to carry out the tasks they have been assigned.
- Assess the chosen systems of work: Are the risks proportional to the benefits? If yes, proceed with the tasks after ensuring that goals, both individual and team, are understood, responsibilities have been clearly allocated, and safety controls including procedures are understood.
- If no, continue as below:
  - Introduce additional controls: Reduce residual risks to an acceptable level; if possible, by introducing additional control measures, such as specialized equipment or personal protective equipment. Determine additional controls that may be necessary in dynamic situations – then provide additional training including scenario work and ease of control implementation. Consideration of human factors and specific communication techniques may be necessary.
  - Reassess systems of work and additional control measures: If risks remain, ask if the benefits from carrying out the task outweigh the costs if the risks are realised. If the benefits outweigh the risks, proceed with the task. If the risks outweigh the benefits, do not proceed with the task, but consider safe, viable alternatives.
- While this approach is not new, it is the “how” of dynamic situations that are to be managed where predictable hazards may or may not be present, or may be transitory. The elements of a good management system for dynamic risk are:
  - high-quality predictive risk assessments – so one can be prepared.
  - a process for developing risk control strategies.
  - training to ensure operatives can identify the risk and know how to keep themselves safe.
  - a positive safety culture to empower all operatives to say NO and ensure they apply controls consistently and behave safely.

- an effective feedback system so that managers and other operatives can learn from experiences and develop further risk-control strategies, including the development of training scenarios to simulate potential experiences.

It is about developing an effective safety risk management process rather than trying to wrestle with a new, separate and distinct type of risk. Is your staff equipped to deal with rapidly changing circumstances when something radical happens--something that doesn't fit the established processes--can your staff respond effectively?

We can simplify this with an example of vehicle checks. I train my people to carry out checks before they enter a vehicle but, with staff using various means of transportation all over the world, the bottom line has to be that they make a judgement on the spot--if they're not comfortable, they don't make the journey. Lets apply this to an industry-specific example, mining. This is where I do a considerable amount of my work. We can apply this to the explosive truck that will be going down into an open pit. We can also take it the step further – on circle check all is within normal operating limits, but as we start to go down the ramp into the open pit the brakes fail. Dynamic risk assessment is now essential as we decide to ride it out, take the runaway ramp, or take the berm to slow us down.

Training is essential to achieve consistency of response, but there must also be a system and a culture that supports the decisions made. To those in police, fire fighting, or other emergency services, and within a mining situation, knowing what is going on around you and understanding the consequences is mission critical to incident stabilization and mitigation, and profoundly crucial in terms of personnel safety.

Situational awareness is a combination of “definitions” or previously learned knowledge. This combined with new information gathered from the incident scene and surrounding environment enables the formation of a strategy required to make effective decisions that keep themselves and members of the public safe. Therefore, does dynamic risk assessment and situation awareness apply only to emergency services? No, this is a field of study concerned with the perception of the environment and is critical to decision makers in complex dynamic areas. It has been used in aviation, air traffic control, and power plant operations, as examples. It is applicable to more ordinary but nevertheless complex tasks, such as driving an automobile or motorcycle or as difficult as operating a remote mucking operation underground.

A growing number of occupations have to make swift hazard and risk judgements and identify controls, sometimes on their own and in high-pressure, potentially stressful environments. Police, firefighters, production engineers, teachers, health care providers and workers who are alone or isolated are among those who work in environments where the situation is constantly changing, with things in and out of their control. Unexpected hazards can appear in any work environment, and to deal with these situations, organizations are increasingly turning to the principles of dynamic risk assessment to help them manage the risks and to train, educate, equip, and support their employees effectively.

I am proud and grateful that my son and his co-workers were trained to manage and respond to a predictable risk while in a dynamic situation, and can tell the tale.

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