

Situation Awareness

Associated non-technical skills for the NSW mining and extractives industry

FACTSHEET

5

Situation Awareness

What are associated non-technical skills?

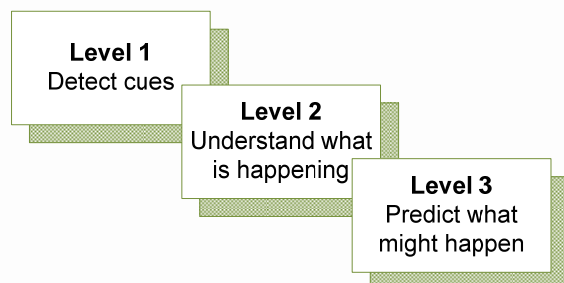
Associated non-technical skills are mental, social and personal skills that support technical and management skills. They help staff do their work safely and efficiently.

These skills include:

- Situation Awareness (Factsheet 5)
- Decision Making (Factsheet 6)
- Leadership (Factsheet 7)
- Communication (Factsheet 8)
- Teamwork (Factsheet 9)

What is situation awareness?

Situation awareness is the way a person keeps aware at all times of what is happening around them. It is made up of three levels:



To maintain situational awareness a person must listen, watch, understand and be able to predict what might happen.

Level One – Detecting cues

To build awareness people must take in cues from their surroundings.

This includes information about the actions of people, movement of objects, closeness of things, lay of the land, changing conditions etc.

For example: A bulldozer operator in an open-cut pit will get information from many sources, including the dashboard, the performance of the machine, lay of the land, radio communications from a control room. The operator will put this information, and much more, together to get an overall picture of the work they are doing and the risks they might encounter.

Level Two – Understanding what is happening

A person puts together all the cues from their surroundings to get an overall understanding of what is happening as they do their work.

A person's knowledge and experience of their work and surroundings will affect how well they can assess the information cues and build a reliable picture of what is going on.

For example: After putting together information gained from situational cues, the bulldozer operator may realise a smaller vehicle has been placed in danger by entering the bulldozer's exclusion zone.

Level Three – Predicting what might happen

Accurate situation awareness can be used to predict what might happen if a particular decision is taken or an action is performed. The predictions must take into account the current situation and how that situation might change.

Experienced workers use their reliable situation awareness to identify risks as they work and decide on effective risk controls.

For example: If the bulldozer operator loses contact with mine control, they can predict this will result in an increased risk that an unauthorised vehicle may enter their exclusion zone. The operator can then take steps to reduce this risk.

Once risk controls are in place, workers continue to use situational cues to make sure the risk controls are successful.

The continual use of situation awareness underpins effective planning and evaluation of work processes and reinforces safe and efficient work performance.

Team-based situation awareness

When working in groups people can pool information cues they take from their surroundings to build a dynamic team situation awareness.

Each team member may contribute their own specific skills to team situation awareness to make sure the most effective decisions are made.

Team-based situation awareness relies on clear communication within the team, such as people talking to one another. It may be reinforced by feedback from technology-based control systems.

For example: A team of mechanics disassembling a large piece of plant must coordinate their activities closely and continually talk to one another if they are to avoid the risks they face – risks that could involve falling objects, exposure to harmful substances and crush injuries.

Factors affecting situation awareness

Situation awareness is a process of thought that draws on information from a person's senses, their work history and memories of their work. The sensory inputs come through sight, hearing, smell, taste and touch. Information from all these different sources is used to think about risks in the work situation.

But there can be problems if people are overloaded with too much information. It has been said that people can process up to seven bits of information at any one time. Go beyond that limit and people can become confused. This will result in poor decision making. Decisions can also be affected if people are distracted or interrupted.

Risk exposure can increase if a vital piece of sensory information is missed. For example, the constant noise from machinery may mean a person doesn't hear a warning shout.

Maintaining situation awareness can also be undermined by physical or mental fatigue, heavy workload, anxiety, time pressures, noise, vibration, extreme heat or cold, poor lighting and a number of other stresses.

For example: A high pressure water cannon operator at a washing plant at 5 am in the middle of winter needs to maintain constant situation awareness.

Over time people build up mental pictures of how work should be performed and the outcomes they can achieve. These mental pictures allow people to go about their work efficiently and with confidence. But faced with an entirely new situation these set mental pictures may limit a person's ability to quickly understand and respond to the new demands.

Errors in situation awareness processing

Errors can be made at each level of situation awareness processing.

At Level One (detecting cues) a person may miss critical information from the work surroundings or they may not have been given an accurate briefing about their work.

At Level Two (understanding what is happening) a person may not properly understand the information they have identified. This may cause them to develop a mental picture of their work that does not match the reality of their surroundings, which, in turn, may lead them into unsafe actions.

At Level Three (predicting what might happen) a person may make wrong predictions about a course of action because they have misinterpreted the lessons of experience and failed to build an accurate picture of their work and its outcomes. Inexperienced workers are more likely to make this mistake because they have had less time to test their assumptions against the hard edge of reality.

Maintaining good situation awareness skills

There are a number of ways to help people build good situation awareness skills.

Good pre-job briefings

Simple and accurate pre-start briefings help a person develop a clear understanding of the nature of the task and any related risks.

Fitness for work

A physically and mentally fit person is better placed to maintain accurate situation awareness.

Minimising distractions

Distractions and interruptions should be kept to a minimum, particularly when critical decisions are being made.

Feedback

Feedback and mentoring can reinforce accurate mental pictures that truly reflect the reality of the work environment.

Alertness

People must keep alert and focused on what they are doing so they don't miss critical information. Members of a team should keep watch for a team member whose thoughts appear to have wandered.

Clarify uncertainties

People must be encouraged to ask questions if they are unsure about something. There must be no uncertainties about work requirements.

Time management

There must be enough time to do a task safely. No person should need to 'hurry up' to get a job done.

A last word

Good situation awareness at work relies on people having accurate information and realistic mental pictures of the work process from which they can make sound decisions and take safe actions.

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Disclaimer

The information contained in this publication is based on knowledge and understanding at the time of writing in March 2010. However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of Industry & Investment NSW or the user's independent adviser.

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