

# Situation Awareness

# Agriculture &

# Aviation

The similarities, and the differences

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NON-TECHNICAL SKILLS IN AGRICULTURE

# What do Farmers & Pilots have in common?

Both operate  
in high risk  
situations.



Both need to maintain  
an awareness of risks  
and hazards.



Both have to consider factors such as  
terrain, weather, and machine function. All  
of which have to be monitored, and can  
change in an instant!



Both operate in a high tech  
environment when operating machinery,  
and must use sophisticated  
instrumentation.



Both need **Situation Awareness** to work safely, in  
addition to the required technical and procedural  
knowledge.

Other than the obvious differences in the machinery, and  
mission goals, training development differs between farmers  
and pilots:



Pilots must undergo mandatory training in non-  
technical skills (crew resource management),  
including **Situation Awareness**, farmers do not.

# What is Situation Awareness?

Situation awareness is the mental picture of your current environment. Frontline staff (farmers and pilots) use their technical and procedural knowledge (what are the main hazards, what are the regulatory guidelines) to generate an understanding of their surroundings. This will include information about team members and the current state of any technical systems: be it an aircraft's flight instruments or the various interfaces of a tractor. This complete and integrated picture can help when making situation based task decisions and weighing up task risks.<sup>1</sup>

**Situation awareness involves three stages:**



**1. The perception of surroundings**  
*(i.e. spotting live wires)*



**2. The comprehension of the situation**  
*(i.e. live wires are dangerous if touched)*



**3. The projection of future status** *(i.e. if I do not lower the arm of my tractor, I will touch those wires)*



# Situation Awareness: Guidelines and Lapses

## Agriculture

### SA in the tractor cab

#### **Awareness of tractor systems:**

Farmer(s) must monitor tractor systems through maintenance and observation of instrumentation. Any changes should be reported to the team, or an engineer.

#### **Awareness of environment:**

Farmer(s) should regularly collect information about the surrounding environment, including weather changes, the terrain, the location of other team members and the location of potential hazards.

**Anticipation:** Based on their understanding and awareness of their environment, and the status of the tractor, farmer(s) should be able to anticipate and avoid potential problems.

## Aviation

### SA in the cockpit<sup>2</sup>

#### **Awareness of aircraft systems:**

Pilot(s) must monitor aircraft systems, and should report any changes to the rest of the team.

#### **Awareness of environment:**

Pilot(s) should regularly collect information about the surrounding environment, including weather changes, the position of the aircraft, and details about other air traffic

**Anticipation:** Based on their understanding and awareness of their environment, and the status of the aircraft, pilot(s) should be able to anticipate and avoid potential problems.

### **Example lapses in SA:**

**Distraction:** Task procedures interrupted, which can lead to missed steps.

**Cognitive tunnelling:** Primary focus on one aspect of a task leading to other aspects, such as changes in the environment, being ignored.

**Internal focus:** Focus on thoughts or worries can lead to changes, or information, being missed.

**Complacency:** Routine task activities can lead to boredom and reduced awareness.



# Is Situation Awareness Important for Safety in Agriculture?

The term situation awareness can be traced back to World War One German fighter pilot Oswald Boelcke, who described the importance of gaining an awareness of one's enemies before they are aware of you.<sup>3</sup> Situation awareness is now a key concept in aviation and a fundamental component of safe flying. Consequently, major airlines have adopted simulator training to enhance situation awareness as part of Crew Resource management (CRM) training.<sup>4</sup>

A recent interview study with farmers highlighted situation awareness as a core skill in

agriculture. When asked to describe recent accidents, a large proportion of farmers discussed incidents that included a lapse in situation awareness, such as poor visibility in tractors and distractions when operating machinery. In contrast, when discussing safe practice, farmers reported the importance of keeping an eye on their surroundings, monitoring any changes in the environment, and considering the outcome of any actions. Several farmers reported that their past experience allowed them to anticipate potential problems, such as spotting when cattle were unsettled.<sup>5</sup>

**If training in situation awareness has had a positive impact on the aviation industry, is it time to apply a similar approach to agriculture?**



## References

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Situation awareness is an important skill in conjunction with the safety management practices and procedures recommended by the HSE.



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