

# NON-TECHNICAL SKILLS IN AGRICULTURE

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What are they, and why are they  
important?



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NON-TECHNICAL SKILLS IN AGRICULTURE

# WHAT ARE NON-TECHNICAL SKILLS?

- ▶ Non-technical skills are the social (teamwork, leadership, communication) and cognitive (situation awareness, decision-making, task management) skills that complement technical and procedural knowledge to enhance safety and efficiency.
- ▶ Non-technical skills first came to prominence within Aviation when it was realised that a focus on aspects such as aircraft reliability, technological advancement, technical knowledge and work conditions, wasn't telling the full story about what happened during aircraft crashes.
- ▶ Analysis of accidents suggested that lapses in non-technical skills were also contributing to incidents – people on the front lines could make a real difference to how each incident played out through their actions.
- ▶ Since then these skills have been examined in other safety critical industries such as offshore drilling, healthcare and nuclear power.
- ▶ More recently this focus has turned to **farming**.



# Why are non-technical skills important?<sup>2</sup>

- ▶ Analyses of incidents across industry indicate that up to **80%** of causes leading to the incident are based on **Human Factors**, meaning the human element in the system as opposed to a technical fault.
- ▶ Prof Flin states, in her key text 'Safety at the Sharp End', '*we know human error cannot be eliminated, but efforts can be made to minimise, catch and mitigate errors by ensuring people have the appropriate non-technical skills to cope with the risks and demands of their work*'.
- ▶ Examples of incidents where failures in non-technical skills have been identified as one of the causal factors include: Chernobyl, Piper Alpha, Kegworth and Deep Water Horizon.
- ▶ Non-technical skills complement technical knowledge, for example a pilot or farmer will make a decision based on their assessment of technical aspects of the situation, but the process of decision-making itself (weighing up the options, considering alternatives, managing risk) is a non-technical skill.
- ▶ Technical expertise alone cannot prevent accidents: Poor non-technical skills **increase the risk of error, injury and accident at work.**



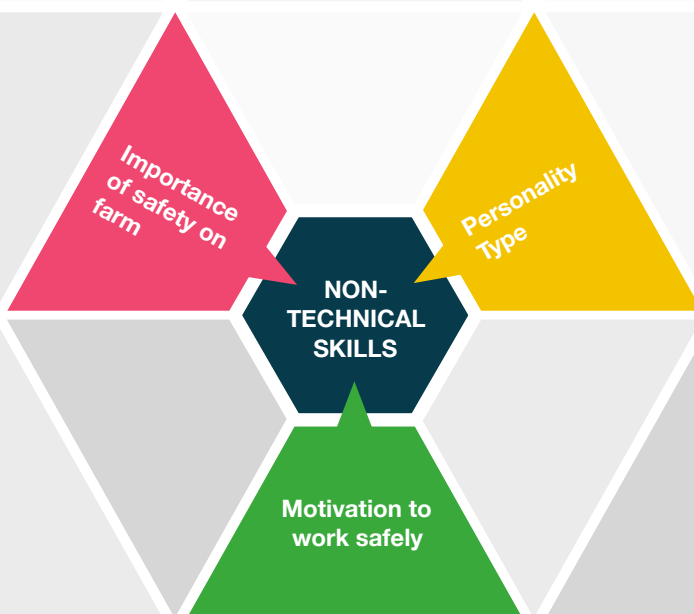
# Non-technical skills in farming<sup>3</sup>

- ▶ An interview study conducted by the Industrial Psychology Research Centre reported that farmers used non-technical skills when working in a team, and when working alone (see table below for lone skills).
- ▶ When these skills were used successfully accidents and injuries were avoided. When there were failures in these skills accidents occurred as a result.

NTS category	Skill sub-category	Definition
Situation Awareness	Perception of surroundings	Maintaining an awareness of your surroundings at all times.
	Comprehension of situation	Understanding each situation. Incorporating new information into that understanding as required.
	Prediction of future events	Anticipation of potential problems, such as animal misbehaving.
Decision-making	Assessment and management of risk	Weighing up the risks and trying to minimise them where possible.
	Compensation for changing environment	Being flexible and changing your plans according to the environment.
Task management	Planning	Thinking ahead in terms of what you need to do, including what safety equipment you will need.
	Time management	Managing your time in order to get everything done without rushing.
	Monitor task progression	Keeping an eye on how tasks are going, so you can speed up or take a break as needed.
	Task focus	Concentrating on the task at hand in order to complete it to the best of your ability. Avoiding distractions.

# PERSONAL CHARACTERISTICS

- ▶ The Industrial Psychology Research Centre is continuing to conduct research in this important area. The next phase of research looked at the relationship between individual factors such as personality type, attitude towards safety and risk, and non-technical skills.
- ▶ The results indicated that farming experience (years of farming practice), neuroticism (the level to which a person worries, or becomes anxious) and conscientiousness (how thorough and meticulous a person is) were all linked to non-technical skills.
- ▶ Essentially the less you worry and the more thorough you are, the more likely you are to have a good set of non-technical skills.
- ▶ Additionally, the more motivated you are to work safely, and the more important safety is on your farm, the more proficient your non-technical skills are likely to be.



# FIND OUT MORE

- ▶ You can read more about the research mentioned here by following this link:
  - ▶ <http://www.sciencedirect.com/science/article/pii/S0925753514003294>
- ▶ To get involved in this research, or to ask any questions you may have, please contact **Dr Amy Irwin** ([a.irwin@abdn.ac.uk](mailto:a.irwin@abdn.ac.uk))

## References

- 1) Flin, R. (2017). Enhancing safety performance: Non-technical skills and a modicum of chronic unease. In: Bieder, C., Gilbert, C., Journe, B. Laroche, H. (eds). *Beyond Safety Training, Springer Briefs in Applied Sciences and Technology*, 45-58.
- 2) Flin, R., O'Connor, P. & Crichton, M. (2008). *Safety at the Sharp End*. CRC Press, US.
- 3) Irwin, A., & Poots, J. (2015). The human factor in agriculture: An interview study to identify farmers' non-technical skills. *Safety Science*, 74, 114-121.
- 4) Irwin, A., & Poots, J. (2018). Predictors of attitudes towards non-technical skills in farming. *Journal of Agromedicine*, 23, 60-69.



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