Improving farm safety, one task at a time

An Applied Psychology and Human Factors Approach

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UK (HSE, 2019)

39	Fatalities
x18	Industry average
6	More than last year

Ireland (HSA, 2019)

18	Fatalities
!	Highest rate
3	More than last year

Team

Research

Tools

NTSAg Team

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NTSAg Research

Applied Psychology and Human Factors view on **farmer safety**

Why do farmers behave the way they do?

Produce relevant empirical findings on **farmer safety**

Non-technical skills (NTS), including situation awareness (SA), as well as risk perception

Improve **farmer safety**

Educational materials and interventions

NTSAg Research

Project 1

Interview study on non-technical skills in agriculture (NTSAg)

Project 2

Survey study on predictors of NTSAg

Project 3

Vignette study on tractor-related risk perception and management

Project 4

Vignette study on cattle-related risk perception and management

Project 5

Survey study on SA requirements and errors for tractors

Project 6

Interview study on the impact of stress and fatigue on SA

NTSAg Research

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Interview study on non-technical skills in agriculture (NTSAg)

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Project 4

Cattle handling in high-risk scenarios

High number of injuries caused by cattle

Online survey

8 vignettes, 2 per category of risk

Self, animal, environment, equipment

56 UK and Irish farmers

Project 4

More likely to proceed when fatigued or stressed

Less likely to proceed when dealing with faulty equipment or an unfamiliar bull


“Fatigue can impact the decision-making process.”


“Always under stress, you get used to
it after a while.”


“Animal welfare comes first.”
“Has to be done”.


“If milking is not completed then the farm will lose money.”
“Lone workers do not have a choice”.


“I can rest after milking is done.”
“I would take a strong cup of coffee and something to eat.”


“Often working with animals can
make you feel better”.


“Not handle cattle in an extreme stress.”
“Address each issue independently.”

Project 4

Farmers reported the use of cognitive non-technical skills

These included task management and situation awareness


“You need to organise yourself better to avoid it.”
“A task list to work through.”


“Awareness of where the bull was.”
“Bull seems to be in low mood, so this may be a dangerous strategy.”

Project 4

Stress and fatigue should be emphasized more as risks

Situation awareness should be trained

Project 5

Situation awareness requirements and lapses for tractor operators

SA checklist and user guide

SA – the mental picture of what is going on around you

SA – perception, comprehension and anticipation

SA requirements – different for each industry

SA errors – Level 1, 2 or 3

57 UK & Irish tractor operators surveyed about routines and issues

Project 5

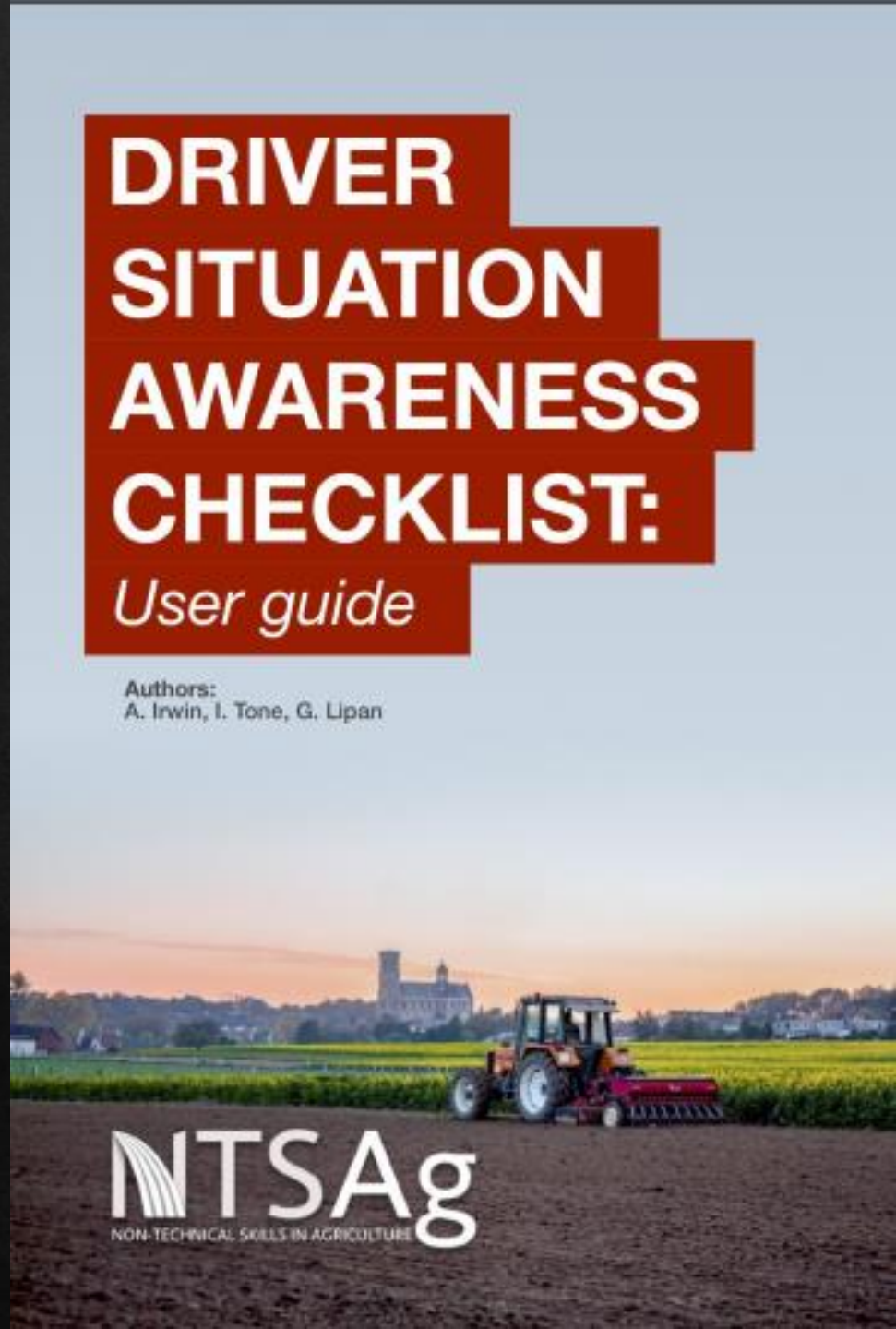
SA requirements ranged from internal cab systems to the status of implements

SA errors mostly occurred at Level 1

Factors leading to SA errors included fatigue and task pressure

Checklists

- Can make safety checks more consistent
- Enhance safety in other high-risk industries
- Act as mnemonic aid
- Should cover safety checks for a specific task
- Research and input from several farm safety organisations and farmers
- Mobile app in development



TRACTOR SITUATION AWARENESS CHECKLIST

Are you a safe driver?

KEY CHECKS PRIOR TO OPERATION

ENVIRONMENT

- Location of obstacles/obstructions
- Location of other vehicles
- Light level
- Location of people and animals
- Weather
- Location of power lines
- Ground conditions

PERSONAL

- Health/Illness
- Stress level
- Fatigue level

STATUS CHECK

- Oil, fuel, water levels
- Tyre pressure
- Brakes
- Position of switches
- Position of throttle
- Lights and indicators
- Need for maintenance
- Faulty parts

TRACTOR PERFORMANCE

- Stability and balance
- Tractor speed
- Stability and weight of implements
- Security of tractor load/trailer

SAFETY CHECK

- PTO guard & safety chains
- First aid kit
- Hitch safety & security
- Mobile phone/radio
- Seatbelt
- All items secured in cab

SITUATION AWARENESS IS A KEY SKILL FOR ALL DRIVERS.

This checklist should help you enhance the three levels of situation awareness:

PERCEPTION: Noticing what is going on around you.

COMPREHENSION: Using your training and experience to weigh-up the situation.

ANTICIPATION: Thinking ahead to identify potential problems and act to stay safe.

SITUATION AWARENESS REQUIREMENTS

(what you need to know before you begin work):

- ✓ Environmental conditions
- ✓ Personal status/health
- ✓ Tractor status
- ✓ Tractor performance
- ✓ Mental map of farm
- ✓ Task requirements

TIPS

TALK: Share information with friends, colleagues and family.

PLAN AHEAD: Think about what you need to stay safe.

CHECK: Your surroundings, equipment and yourself.

SITUATION ASSESSMENT:

The following factors are some of the possible issues that could lead to a loss of situation awareness, increasing the risk of accident or injury.

If any of these issues are present tick the NO-GO box and **STOP**, **THINK** and **TAKE ACTION** to resolve the problem or reduce the issue, before you begin work.

Possible actions might include delaying the task, getting more equipment, fixing broken parts, considering alternative actions, getting more information.

	GO AHEAD	NO-GO
VISIBILITY *(can you see everything you need to?)*		
Vision in tractor cab *(dirty windows, poor mirror placement, view blocked)*	☐	☐
Environment *(darkness, poor visibility due to weather, glare from sun)*	☐	☐
Lighting *(tractor lights working, poor exterior lighting)*	☐	☐
ROUTE / TERRAIN *(do you know the hazards?)*		
Road travel *(tractor not road worthy, high volume of traffic, long journey)*	☐	☐
Terrain *(don't know terrain well, possibility of hidden obstacles)*	☐	☐
Fixed elements *(don't know position of fixed objects such as power lines, barriers etc.)*	☐	☐
PERSONAL *(are you fit to drive?)*		
Illness *(headache, blurred vision, nausea, medication side-effects)*	☐	☐
Fatigue *(tiredness, lack of sleep, long hours)*	☐	☐
Safety *(lack of first aid kit, no phone or radio)*	☐	☐
MANAGING THE TASK *(do you have the time and equipment you need?)*		
Distractions *(loud music, playing games on phone, stress)*	☐	☐
Task management *(lack of time, rushing, missing equipment)*	☐	☐
Tractor *(unfamiliar with vehicle, not used implements before)*	☐	☐

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Pocket guide

Covers safety-critical skills

Engaging with materials and taking notes

Offers a starting point in terms of NTSAg

Allows for personalization for each farm

Project 6

- The experience of stress and fatigue in farming
- How do stress and fatigue impact SA
- Farm stressors and stress symptoms can affect safety
- Long working hours and sleep issues increase risk
- In offshore drilling, SA is negatively affected by stress and fatigue
- Currently conducting interviews

Thank you very much for your attention!
Any questions or suggestions?

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