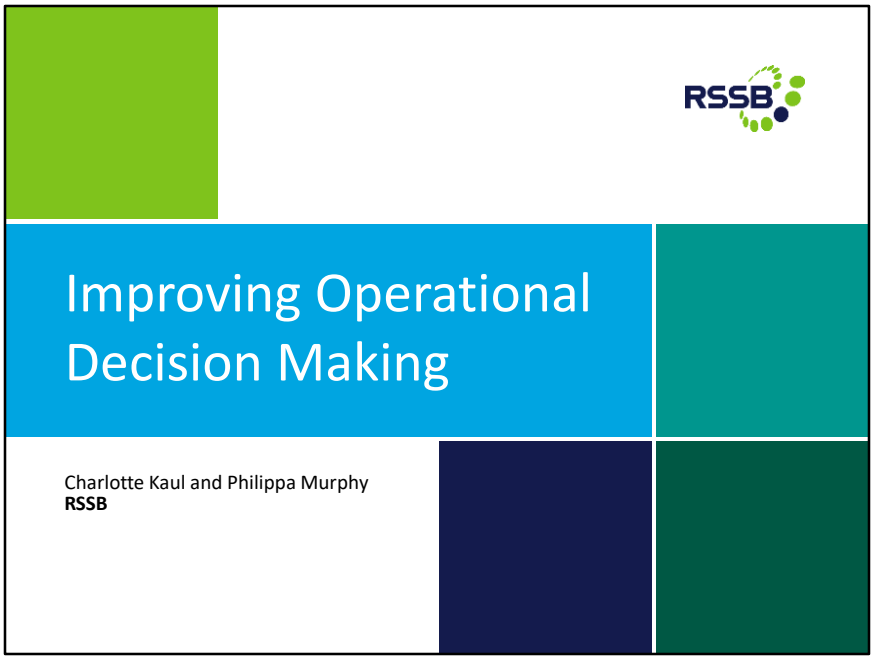


1) RSSB overview – Better, Safer railway through research, management and collaboration
2) Project RDG idea – why don't people make decisions for themselves like the used to

Front line staff AND managers

3) DS tools: Can a decision support tool help people to go back to being able to make decisions?
4) Project overview:

Look at what the problems are now, how other industries used decision support tools

What the railways think of this

The development of our tool

How we will use it in the industry to make improvements

Introduction

1) Rules – Vast amount of rules

Supported by company procedures

Culture – strict adherence to rules required

Management culture around rule violations

2) Where we are now

staff taking the most restrictive and risk-averse actions at their disposal in situations that are not explicitly covered by an operating rule or procedure

Leads to dis-empowered staff

Performance delays and issues not getting rectified as quickly as possible

Escalating phone calls

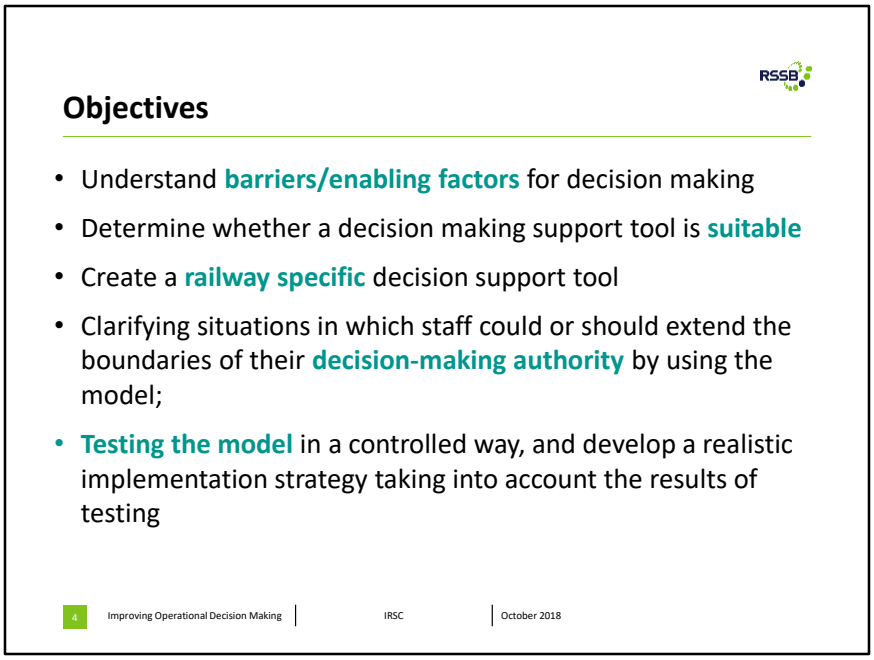
Detrimental effects on whole-system safety and train performance.

3) Why the industry needs to move:

- Empower staff to act as professionals
- Permission to make decisions
- PERMISSION TO ACT
- Improve performance

Which scenarios does this apply to?

1. Not covered - Where that are not explicitly covered by a rule that can be directly applied
2. Circumstances - Where there may be an applicable national rule, but an unusual/unique combination of circumstances means that it cannot be directly applied or may not lead to the safest outcome
3. Company policy adherence - Where strict adherence to a company or local procedure may lead to a delay with no foreseeable safety gain



- This project aims to enhance system safety and performance by improving the effectiveness of operational decision making. This will include:
  - Understanding the critical factors and barriers that may affect decision making by staff in abnormal operating conditions, including the impact of managerial or cultural constraints (actual or perceived);
  - Determining whether a decision-making support model for operational staff would work in the railway industry (these are currently used in other safety-critical sectors such as aviation and the emergency services);
  - Creating a railway-specific decision-making support model, if feasible, drawing on experience from other industries, ensuring that this is simple enough for

relevant parties to apply in complex, time-sensitive situations;

- Clarifying situations in which staff could or should extend the boundaries of their decision-making authority by using the model;
- Testing the model in a controlled way, and develop a realistic implementation strategy taking into account the results of testing

Reviewed current psychological research and theory to understand how people make decisions (very briefly)

Then looked at different industries' approaches to decision making- any decision making tools and how they implement those

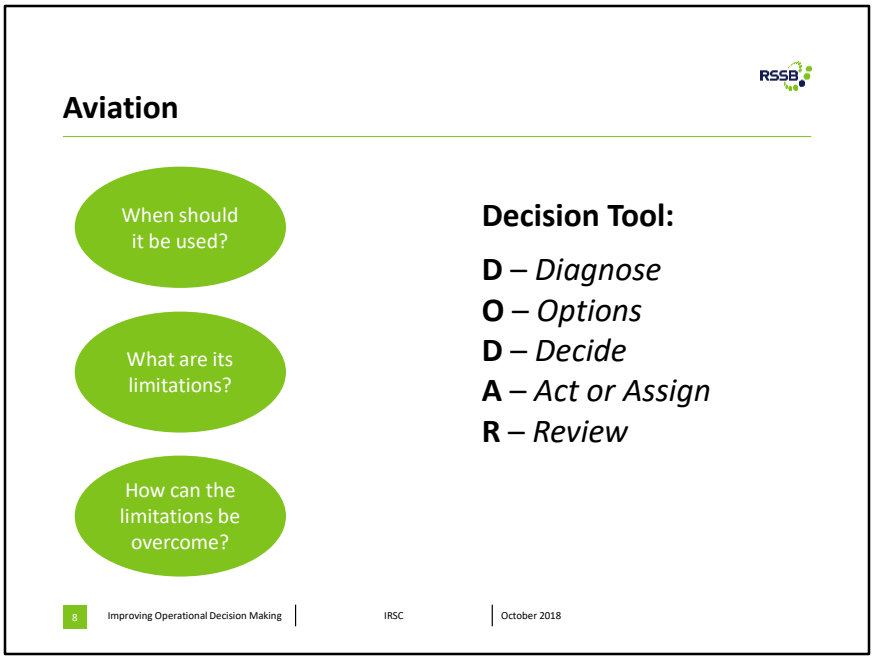
Heuristics

Research suggests that heuristics are often used to take shortcuts in decision-making. Heuristics (also known as “decisional short cuts”) are employed when people apply their knowledge and skills to different contexts without engaging in the effortful tasks of identifying and weighting large information sets

In some scenarios, for example when under time pressure, this is useful and enables individuals to make quick decisions based on their intuition and experience. However, heuristics are susceptible to cognitive biases, and when time permits, it may be optimal to encourage individuals to follow a more structured and rational route of making decisions. In these situations, a decision-making tool could be useful, as it guides individuals through this structure.

Rail

In the rail industry, there is currently little support or training for frontline staff in making decisions. NTS training does cover decision-making in one of its modules, however we don't know how effectively reaches frontline staff, and the content of the module is also limited.



Looked at aviation- safety critical, transportation industry lots of potential lessons to learn

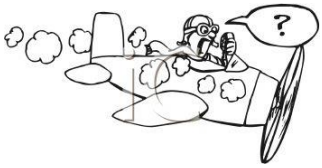
Generic decision aids are used frequently in the aviation industry alongside decision-making training.

One thing aviation does very successfully is to ensure staff are aware *when* to use the decision aid. A decision aid is useful and appropriate when there is sufficient time to make an effortful, rational decision. It is therefore inappropriate to use these tools when a decision needs to be extremely quick.

Another lesson that can be learnt from aviation is that these tools are most useful when paired with training on decision making and where clear boundaries are set for their implementation. Decision aids do not address all the causes of poor decision making, for example a lack of technical skills or bad attitudes will both interfere with decision-making and will not be addressed by decision aids

Training in Aviation

- Hazardous attitudes (e.g. macho, anti-authority)
- Poor technical skills



In aviation training is given alongside the tools to help address some of the things the tool can't do on its own

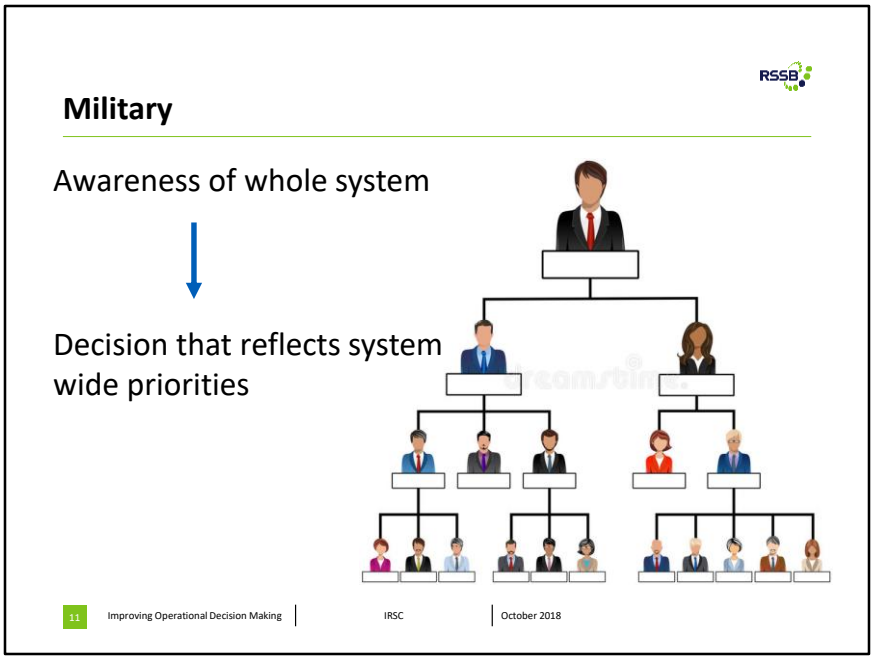
Emergency Services

- Joint decision making

Emergency services use a Joint decision model- similar to the aviation ones and again is implemented with training on how to use it.

Joint decision making is important because police, ambulance and fire staff must often work collaboratively despite having different understandings of situations and different priorities.

Similar to rail where there is a distributed decision making network- how do you make sure you have the same situational awareness across the roles?

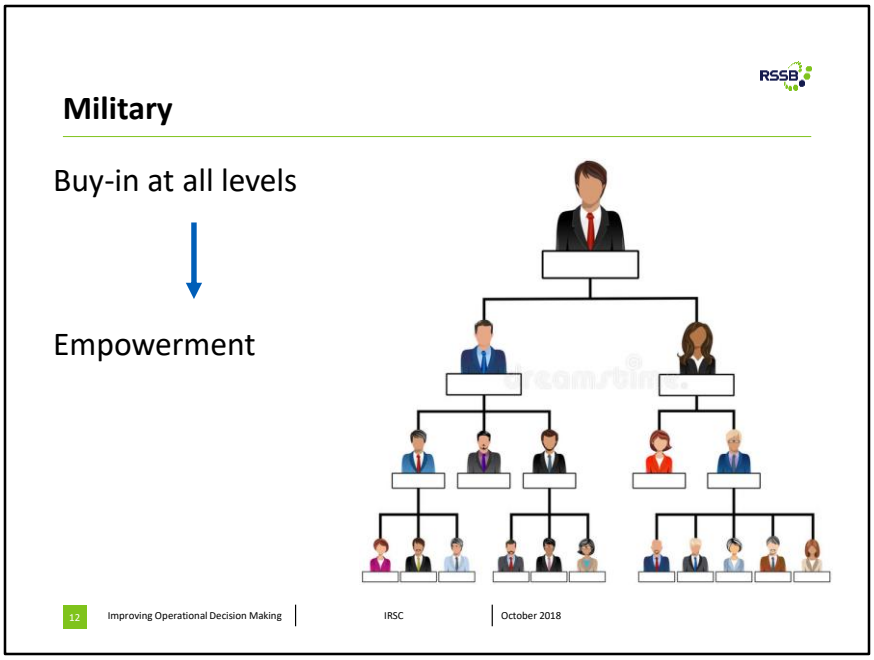


The last industry that was examined in this document was the military.

The military has the most extensive training and focus on decision making, and there are several learning points for the rail industry.

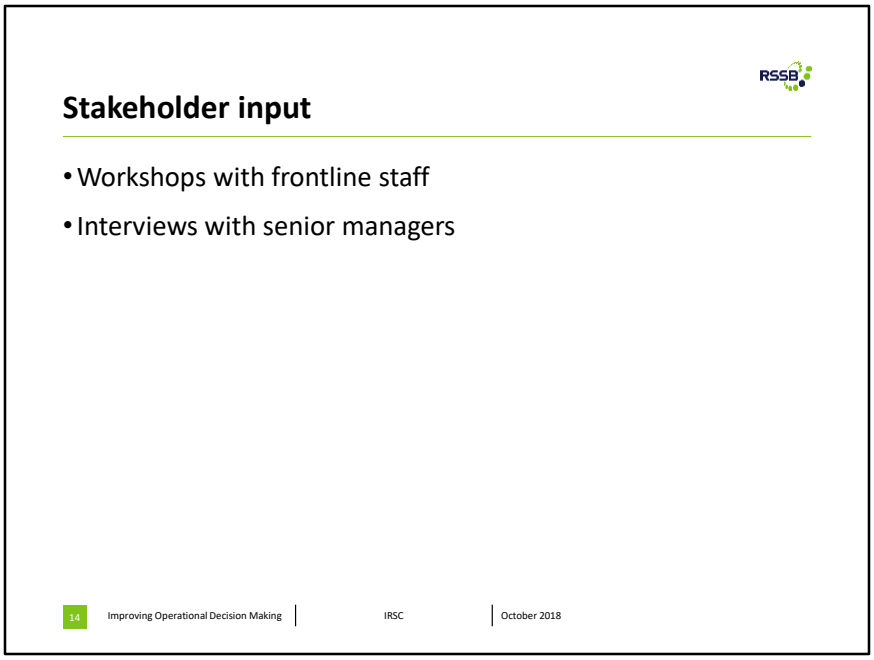
They use the Combat Estimate- a series of 7 questions you must think about when making a decision. It is probably the tool with the least direct application to rail as it is much more in depth analysis and less on the job decision making- however the way they have implemented the tool and embedded it into the culture is really interesting and could be used in rail.

First, awareness of the whole system is embedded for all military staff. This is important and lacking in rail- it is important because a decision based on your train only for example- might besafe for that train but import risk in the wider network. If frontline staff could consider wider network safety when making recisions, this would be good.



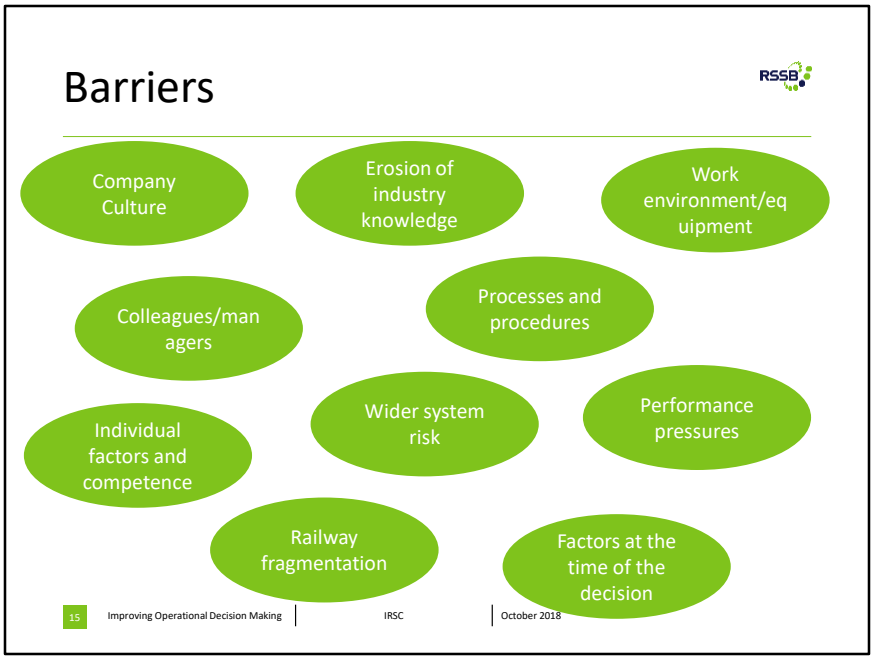
Secondly, in the military staff are empowered to use the Combat Estimate tool and make decisions. All staff are trained on the tool, and it is embedded in a culture where staff feel empowered to make decisions because they know that they are likely to be supported for acting reasonably and in good faith, even in the event of a poor outcome from the decision.

The first phase of work for this project was to get an understanding of the current cluimate of decision making in rail.



We wanted to speak to frontline staff, their immediate line managers, and more senior managers- to understand what the current barriers and enablers are for decision making, to get an understanding of the current safety cu;lture at different companies, and to get some initial feedback on what they thought of a decision making tool.

We carried out 5 workshops and 5 interviews with people from 5 companies, including TOC, FOC and infrastructure manager



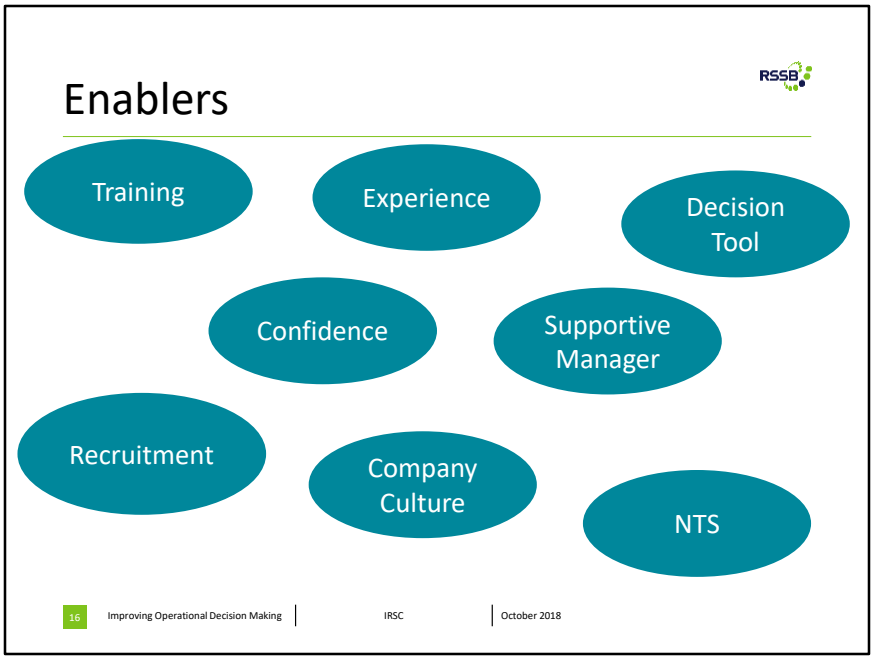
In thr workshops we held a facilitated group discussion on the barriers to decision making, and in the interviews we asked them to talk us through what they thought the barriers for frontline staff are.

- These are the barriers that came out of the workshops and interviews- some key ones to talk about are individual factors and competence, and company

culture- as these were raised the most often.

- Individual factors and competence was about a lack of training in decision making, and sometimes a lack of experience with making decisions, leading to a lack of confidence in your own ability to make a good decision. People also talked about the impact of fatigue and personal issues on their ability to make decisions
- Company culture was about believing that the company would not support them if the outcome of the decision was negative. People felt that decisions were judged on the outcome rather than the decision itself, and were viewed with hind sight, and potentially information that the individual did not have at the time. People felt that for the same decision, if it went well, they would get a pat on the back, and if it went poorly,

they would be penalised.



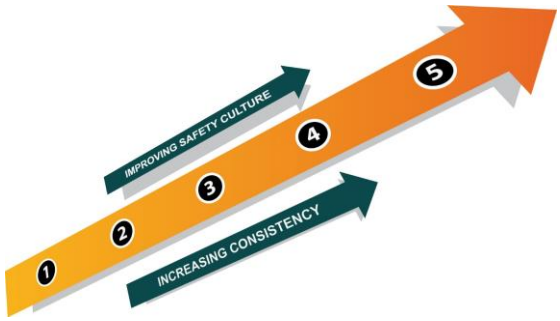
To generate the enablers, subject matter experts came up with some possible enablers and asked workshop attendees to sort these in order of importance. Also gave them opportunity ot add their own. In the interviews, we simply asked the managers what they thought the nablers were. This is what we generated:

Key ones to talk about are training, supportive manager and decision tool

Trainign was the most highly valued enabler- both technical training and training in decision making. Supportive manager was also important, and there was a view from senior managers that managers should have frontline experience

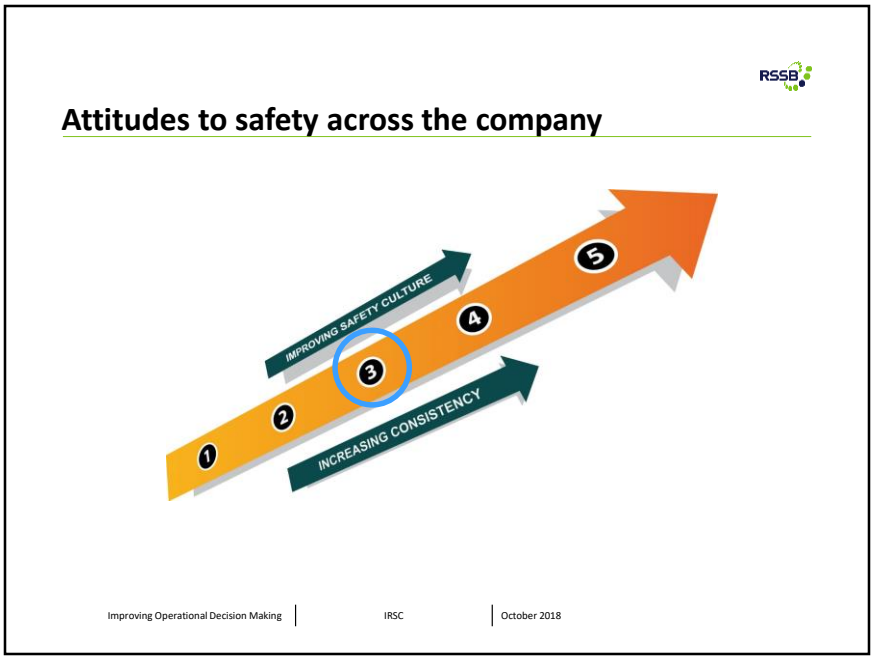
Finally, decision making tools- in this activity frontline staff were a bit unsure of decision making tools as they had never really encountered them- but later in the workshops we had a separate activity on them and I will discus the feedback there in a moment. In the interviews with managers, they were very positive baotu decision making tools, particularly the fact that they force people to stop for a moment, which can help when people get flustered.

Attitudes to safety across the company



Improving Operational Decision Making | IRSC | October 2018

The next activity was designed to understand where people would rank their company in terms of safety culture. One being pathological and 5 being generative. This activity was only done for frontline staff and their immediate managers in the workshops.



The average score across the workshops was 3.4

This means their safety cultures were perceived to be 'calculative' meaning there are low incident rates,
Many employees involved in strategy for safety management, and people accepting personal responsibility for safety.

This was important because a decision making tool would not work in a safety culture that is too poor- The purpose of thisactivity was to fine out if the rail industry is ready for the tool. Is there enough trust and communication for the tool to work?- if it had been 2 wouldn't have suggested it, but at a 3.4, it suggests the culture is mature enough to handle it.

workshop participants were largely open-minded about the possibilities that a decision-making tool would offer: the number of positive comments received outweighed the adverse comments.

Positive feedback centred around helping staff to follow a logical decision-making process when under pressure (due to time constraints or other factors), and being a tool through which staff could record their thought processes and decision steps to demonstrate after the event that their actions at the time were reasonable.

Staff were very clear, however, that a decision-making tool would need to be accompanied both two things. Firstly staff should be trained in how to deploy it. Secondly the model would only be effective in the context of a company culture that accepts that decisions will not always turn out to be correct: where decisions that may have turned out to be sub-optimal, but were based on the information available at the time considered in a structured thought process, these should be treated as opportunities to learn and develop rather than punish. A striking number of comments was received indicating that some participants in each of the workshops felt they worked in a ‘blame culture’ that suffocates pragmatic decision making.

Findings from workshop

Other industries

Keep it short and memorable pneumonic

How we did it – Ops experts, HF experts
Look at the decision steps for staff
Created pneumonic which would be memorable

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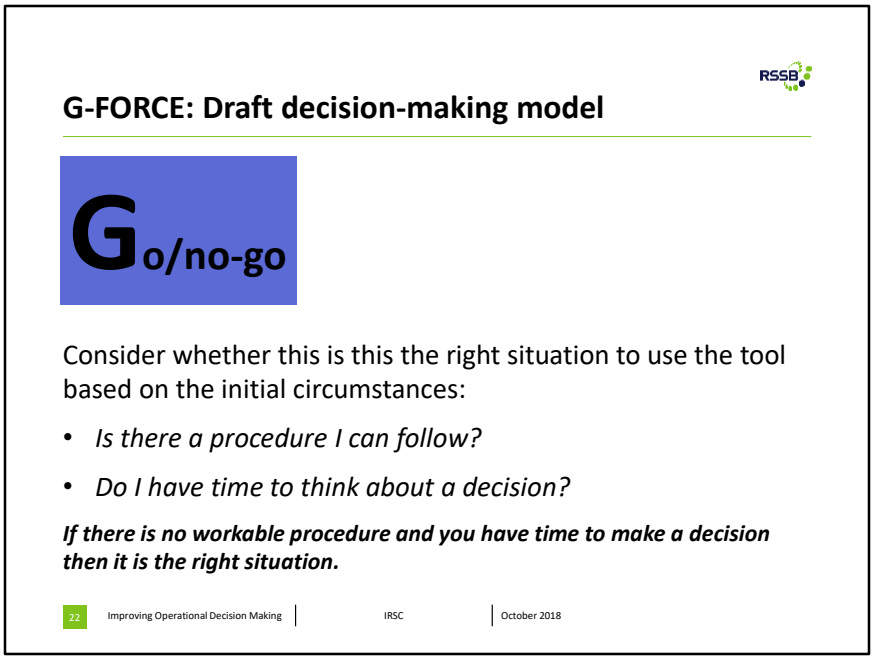
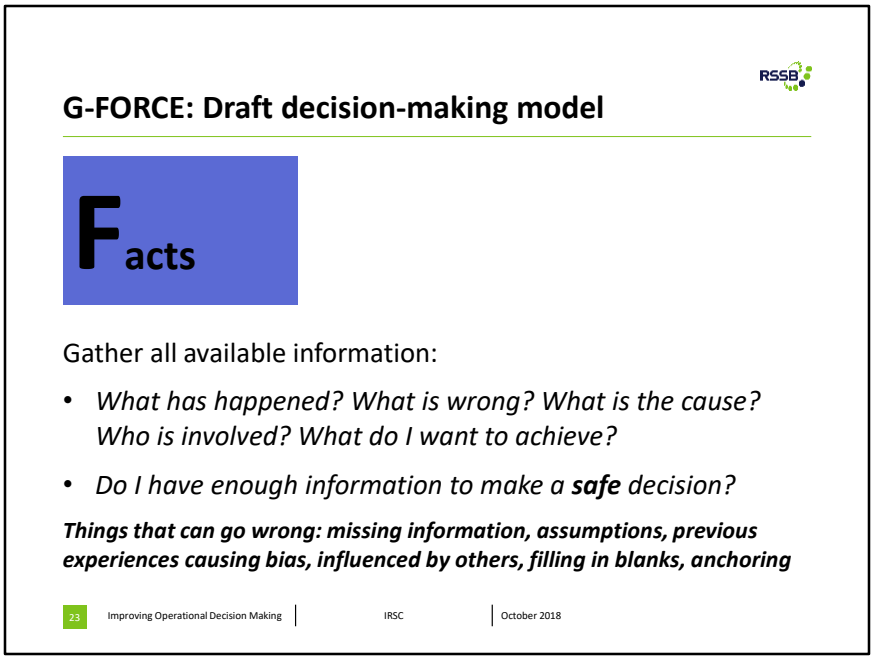


Use it:

- Have time
- No rule / policy to cover it
- Unusual circumstances means it cannot be directly applied
- Strict adherence to company or local procedure cause delay with no foreseeable safety gain

Don't use it if:

- Emergency situation
- Rules cover it
- Safety risk to not following rules



Highlight:
- The problem
- The surroundings
- The decision
- Personal

What can go wrong at this stage – link to the training

DON'T have to remember it all – cover detail in training so more unconscious when used

G-FORCE: Draft decision-making model

Based on the facts, consider what options are available:

- *What can I do to resolve the situation?*
- *What are the alternative options?*
- *Is doing nothing an option?*

Things that can go wrong: first/easiest option preference, risk aversion, confirmation bias, blinkered thinking, rushing/overload/stress

Promote open mindset
Avoid tunnel vision
Link to training

G-FORCE: Draft decision-making model

Risks

Consider the potential costs and benefits for each option:

- *Is it safe?*
- *If it is safe - will it reduce/cause delays?*
- *What is the implication of doing nothing?*

Things that can go wrong: lack of situational/systemic awareness, experience bias, risk propensity, poor prioritisation, organisational pressure

Evaluate the risks – think about the consequences

G-FORCE: Draft decision-making model

Choose

Decide on the best option:

- *If there are multiple **safe** options, which will cause the least delay?*

Execute the best option:

- *Communicate your decision appropriately and take action.*

Things that can go wrong: risk propensity, communication failure

G-FORCE: Draft decision-making model

Evaluate

As the event unfolds, consider:

- *Is this still the best decision? Should I choose another option?*

After the event, consider:

- *Was the outcome as I intended? How can we learn from it?*

Things that can go wrong: sticking with your first plan, anchoring, altering your perception of the situation to justify your decision


Proposed training approach
28

Initial design training approach

- Two part approach
- Emphasis on training and briefing from other industries to increase its chance of success.
- Importance of training on decision making from the workshops
- Training development workshop identified key learning objectives
- Ideal content vs. What industry could provide for ease and to make it cost neutral

Overview of the proposed training

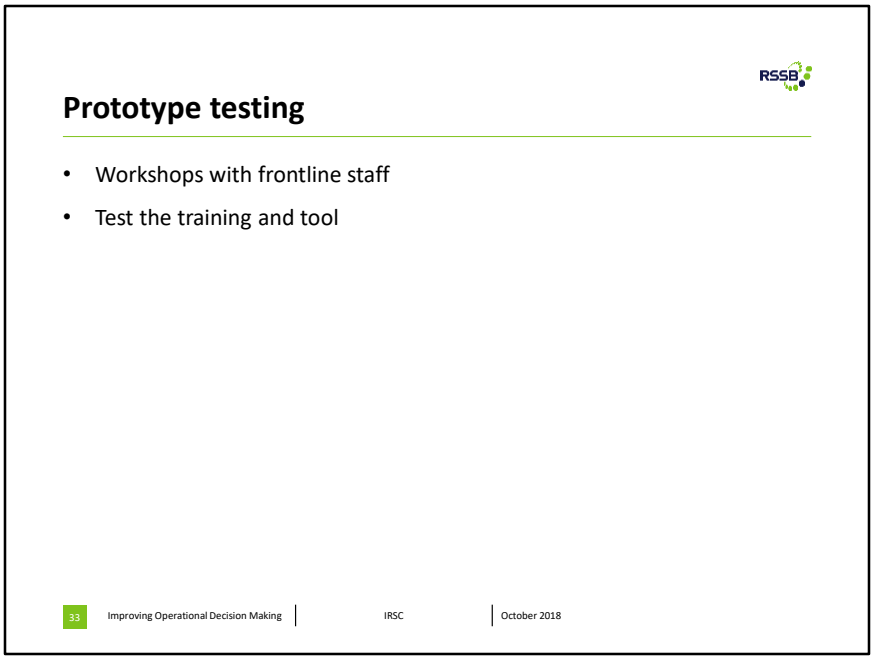
Activity	Aim of activity
Introduction	To introduce the reason for the training. Explain how the training will run. Introduce the tool (when/how to use it and why it is important). Define which scenarios are in scope.
Scenario activity (using example from Aviation)	To illustrate the kind of situations where making a decision could help.
Card sorting exercise: barriers to decision making	To allow learners to reflect on the things that prevent them personally from making decisions.
Introduction to tool	To familiarise learners with the tool in the context of how it can overcome the barriers brainstormed in the previous activity.
Decision making principles	To help learners understand why the tool may be useful when making decisions.
Tool	To explain how to use the tool step-by-step. To inform learners of the common pitfalls when making decisions, and how to overcome them.
Applied scenario	To allow learners to practice using the tool.
Learning culture	To give learners guidance on how to learn from their decisions, and to reassure them of the support from their company.

Increasing the chance of success

Training for line managers

- Why the tool was created / what value it adds
- Fair culture overview
- What they need to do when it has been used
- What not to do when it has been used
- Encouraging meaningful feedback

Prototype testing



How we collected it
What we
Other industries
Add in not expected to remember all the information –guidance
Picked out in detail in the training – don't need to remember all the detail

During this project, the feedback from industry was that they were really excited about this, and wanted to make sure the implementation was as strong as possible. It was decided that a large scale implementation of the tool and training to a live operational environment would be much more useful than the initial smaller scale implementation testing planned.

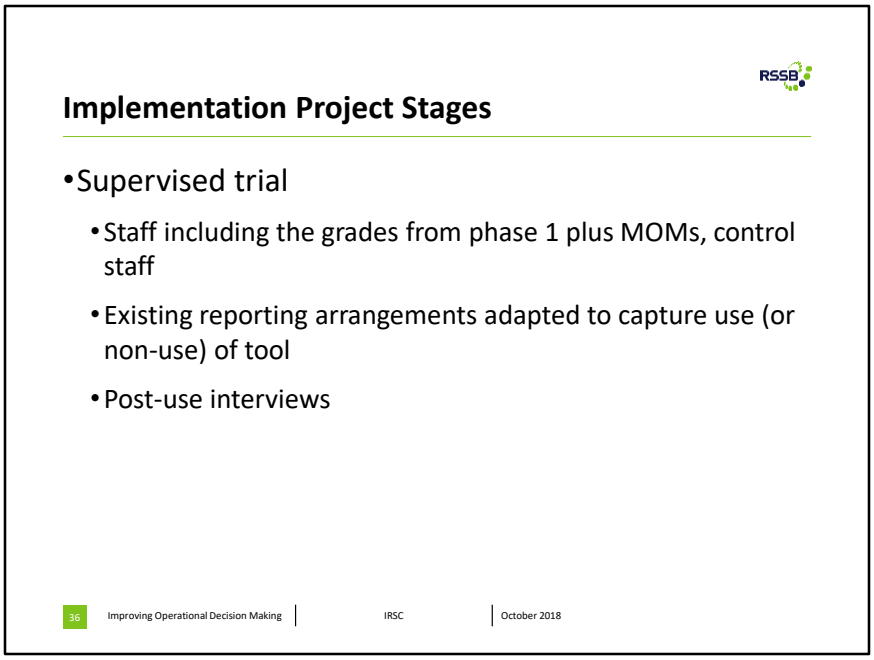
So a project following this one has been scoped and will begin in 2019. We are still developing this project so some of the method is not completely fleshed out yet, but I will explain what we currently plan to do.

Implementation Project Stages

- Tool review and refinement
  - Engagement with senior management to discuss the tool and potential barriers to its use
  - Practitioner/end-user review: managers with control or operations expertise

The project is designed to 'build up' steadily, giving an opportunity to find and address issues before a large-scale implementation. There are 4 parts to the project.

Firstly, we will run workshops with senior managers and practitioners. These will be usability workshops to ensure the tool is usable and make any final changes before the trials.



The second step in the project will be a supervised trial.

A group of around 30 staff will be given the training and asked to use the tool over the next 10 weeks. The grades that will be selected for this trial are the people that will be making decisions on a daily basis)MOMS, control staff)

Added on to their regular reporting form will be a section on the tool, which they will complete every time they use the tool. When they use the tool, we will be alerted and will carry out post use interviews with them.

We will also be conducting some observations of control rooms to observe the tool use in action.

The purpose of this supervised trial is to:

Lessons learned from small-scale application; may lead to optimisation of DMM and/or training.
Better understanding of barriers to and enablers for DMM use.
Mitigation strategies to overcome any limitations of the DMM that phase 2 of the

project uncovers.
Early identification of potential benefits of DMM.

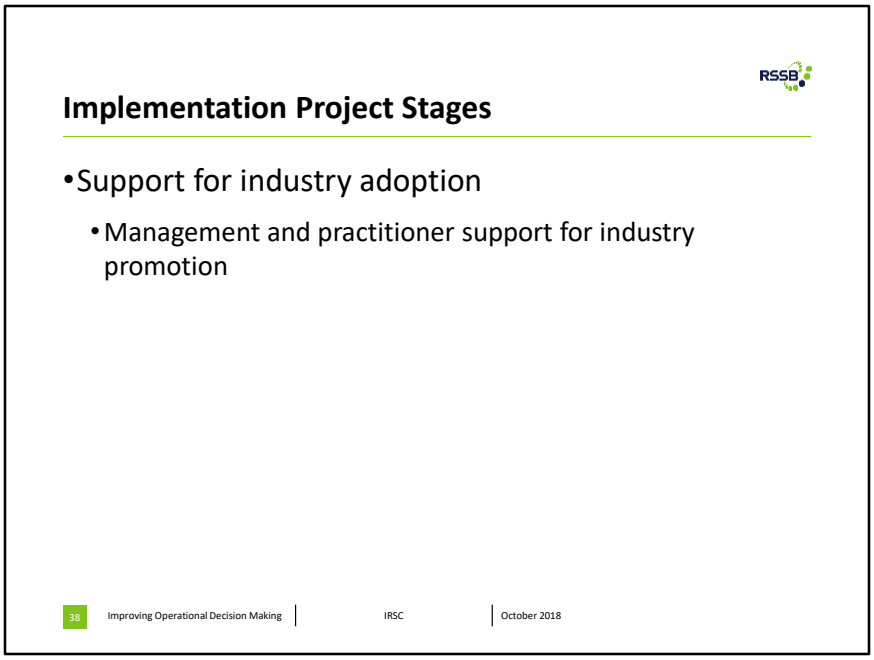
Implementation Project Stages

- Field trial
  - Front-line operational staff, including drivers and signallers
  - Information gathered as for supervised trial

Following the supervised trial will be a wider field trial. Around 100-200 staff will be given the training and asked to use the tool over the next 20 weeks .

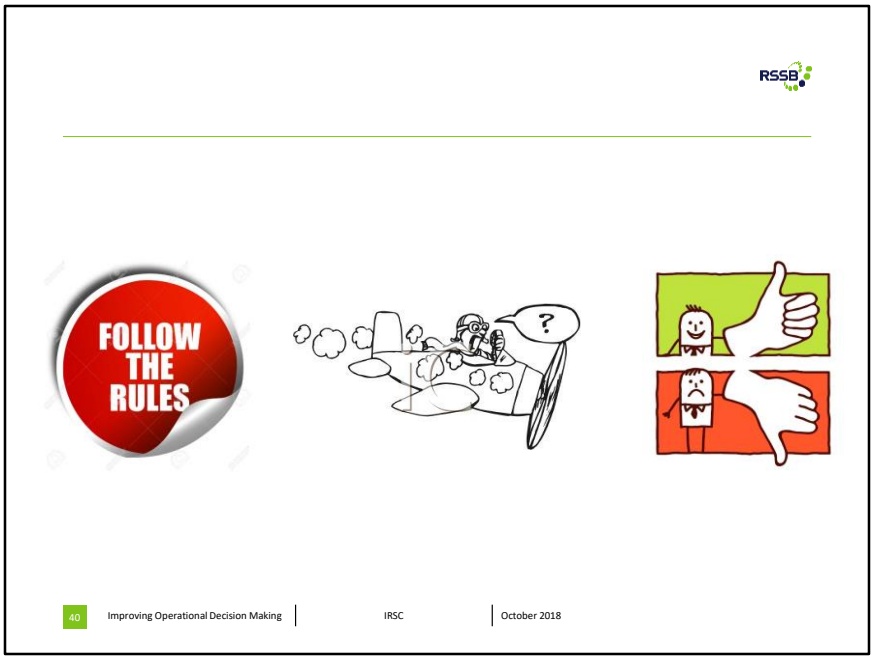
Data will be collected using the same methods as the supervised trial.

We will be measuring
Staff feedback on whether they feel it supports them in making decisions
Incidents where staff made a decision using the DMM but would otherwise have awaited instructions
Professional estimates of the time saved in situations where staff have used the DMM rather than awaiting instructions.



Finally, we will work with the trial company to promote wider use of the tool and the training across the industry.

To conclude



Where we are at and why we need to move

How other industries have adopted it and what it has done for them

Support from front line / managers and RDG senior level support for changes

Other industry moves to support – PTA, Fair culture, NR SLCC

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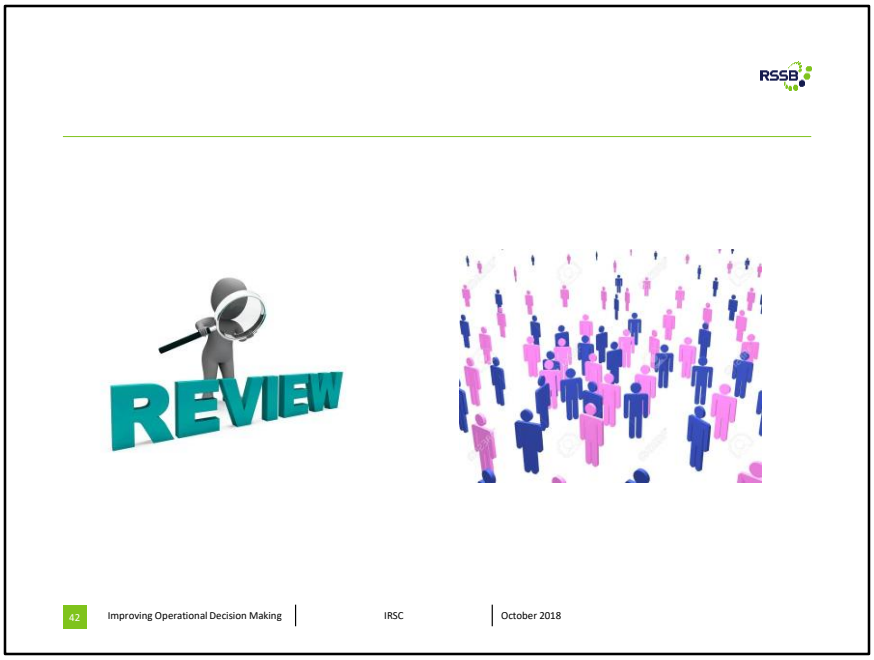
Model and how it can help

Need for training to support attitudinal change in decision making

Management support for the change



Keen to get feedback and make iterations in prototype

Year long immersion

How this will help the industry and people to change and move forwards

Thank you

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