AUSTRALIAN NATIONAL OPERATIONAL GUIDELINES ON DECISION MAKING

Part A: The Incident and Emergency Management Decision-Making Model, Pitfalls and Safeguards

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Foreword

Both this guide and its companion (*The Handbook of Decision Making in Incident and Emergency Management – Guidance for Australian Fire and Emergency Services*[1]) had their origin in our research for Natural Hazards Research Australia (NHRA) project on enhancing decision making in emergency management[2]. In the early stages of the NHRA, research priorities were largely identified through focus groups with emergency management (EM) practitioners. These focus groups highlighted the need for research on decision making and the development of training resources to better support decision making in emergency management. It was further recognised that there was an opportunity to create a common decision-making model for the sector. Development of a common model provides opportunities to:

- improve the alignment and consistency of how EM sector organisations approach operational decision making
- create more consistent doctrine and training resources
- support a common language to describe, discuss, and review decision-making practices.

A somewhat similar approach has been undertaken by the United Kingdom (UK) fire and rescue services with the publication of the National Operational Guidance and the Decision Controls in the Joint Emergency Services Interoperability Principles (JESIP)[3] Joint Doctrine.

In this AFAC guide we propose a common decision-making model for the sector called the Incident and Emergency Management Decision-Making (IEM-DM) Model. The model improves on previous models and frameworks, in that it:

- provides a clear, simple account of decision making that can help people explain how they made operational decisions
- grounds the model in the latest research on human cognition to explain behaviour in terms of how the brain works
- explains how deliberate analytical thinking supplements more automatic intuitive processes
- provides a framework that explains and integrates other models of decision making
- clearly highlights pitfalls and potential safeguards in decision making
- explains common decision-making problems, such as decision inertia, confirmation bias, goal seduction, faulty situation awareness, lack of appropriate review
- enables easy operational application through the provision of ready-to-insert doctrine.

To ensure the model is widely and freely available to all emergency service personnel, this guide is published by AFAC (Australasian Fire and Emergency Service Authorities Council) using a creative commons licence, meaning that it can be copied or reproduced at no cost on the condition it is cited appropriately and only used for non-commercial purposes.

In writing this guide we hope that it assists emergency services teach and support effective decision making during incidents, disasters and crises, to better understand decision making in post-event reviews, and to assist emergency service personnel improve their own decision making.

Acknowledgements

We would like to acknowledge the NHRA for their support in developing the decision-making model and AFAC for providing the opportunity to publish this model and guidance for the Australasian EM sector.

Introduction

This guide outlines four diagrams that describe the Incident and Emergency Management Decision-Making (IEM-DM) Model and a set of statements that explain the cognitive science that underpins the model. The diagrams and set of statements were developed by the authors as part of a Natural Hazards Research Australia (NHRA) project on decision making. The 4 diagrams cover: 1) the basic model, 2) how it works, 3) key pitfalls and 4) some safeguards that can be used to make better decisions.

- Figure 1: The IEM-DM Model.
- Figure 2: Explanation of the key components of the IEM-DM Model.
- Figure 3: Description of the decision-making pitfalls that can occur at each stage of the decision-making process.
- Figure 4: Description of safeguards that can be used to avoid the decision-making pitfalls.

While the diagrams present a reasonably straightforward and accessible depiction of the framework, there is an extensive body of evidence grounded in cognitive science that supports each of the components and provides considerable detail about how they work and interact to create decision making. The set of statements that are included after the diagrams provide short explanations of this underlying cognitive science. The statements explain how each component works and provide insights into why people sometimes make sub-optimal decisions.

Figure 1 and Figure 2 describe the basic decision-making model. The model is a synthesis of the Model of Expert Decision-Making in Air Traffic Control[4] and the S(CD) PAR framework[5]. It is based on the orientation, goals, plans, actions, review framework of activity theory[6] and incorporates both intuitive recognitional decision processes (e.g. Recognition-Primed Decision Making[7]) and more deliberate analytical decision processes. Automatic intuitive recognitional processes are largely unconscious and run all the time. Deliberate analytical processes intervene in intuitive processes to modify situation awareness, goals, plans, actions and review. The model includes a review loop to show that people use feedback and feedforward to monitor situation awareness, goals, plans and actions[8]. The IEM-DM model and other decision-making theories are discussed further in the companion report[1]. The model is designed to be service-agnostic and can be used in both operational and training doctrine, as well as a field guide to support effective decision-making.

Figure 3 describes some of the pitfalls that can occur at each stage of the decision-making process. These pitfalls are based on both the limitations of our human cognitive system and the extensive research literature on human factors and error. Some of this research is discussed in the companion report[1]. Figure 4 describes some safeguards that can be used to avoid the decision-making pitfalls and is a response to the pitfalls identified in Figure 3. The safeguards are based on the research literature on cognitive science and human factors, and the authors' 3 decades of operational expertise across fire and emergency services, pre-hospital, and emergency management contexts.

The IEM-DM Model is an important advance in the theory and practical application of decision making in incident and emergency management. It is both descriptive of operational decision making and provides a strong theoretical underpinning grounded in cognitive science. Taken together, the 4 diagrams and the set of statements help emergency management agencies and their personnel better understand, improve, and justify the decisions they make in operational situations. Ultimately, this helps to improve operational outcomes during incidents and emergencies and better protects people in post-event incident reviews and inquiries.

1.Drummond et al. (2026).

2. Natural Hazards Research Australia (2025).

3. JESIP: Joint Emergency Services Interoperability Principles. Version 3.1 (April 2024), available from https://www.jesip.org.uk/

4. Gyles & Bearman (2025); Gyles & Bearman (2026)

5. Launder & Penney (2023).

6. Frese & Zapf (1994); Windlinger (2021).

7. Klein (1999).

8. The review loop is not intended to imply a direct connection between orientation and actions only. The review loop applies to orientation, goals, plans and actions in an ongoing cycle of review.

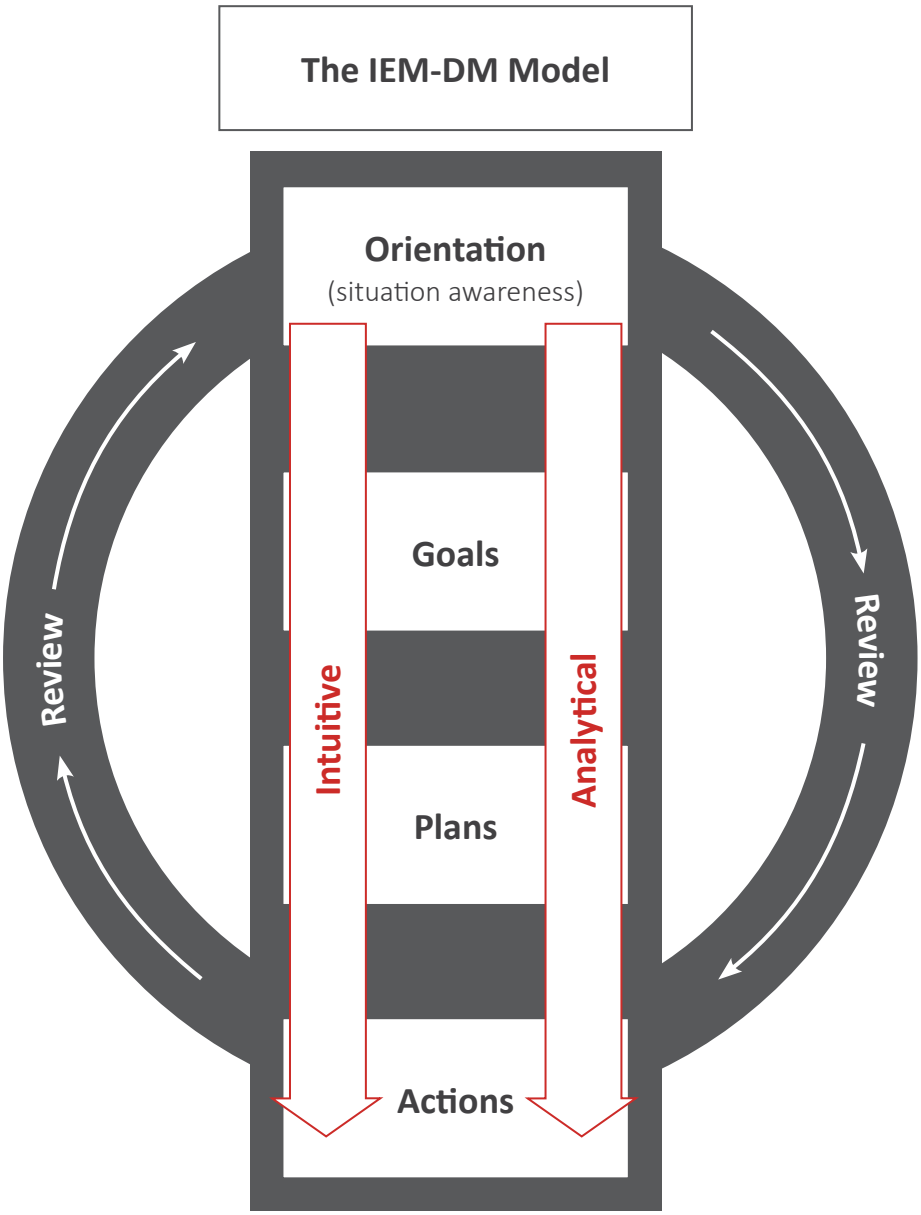


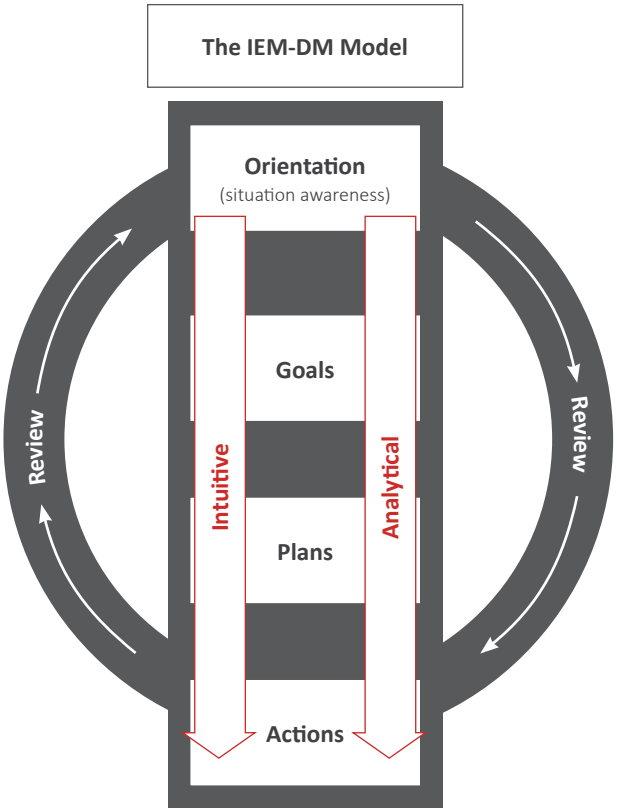
Figure 1. The IEM-DM Model. Bearman, Drummond, Hayes, Gyles, McLennan, Butler, & Flin (2026). Natural Hazards Research Australia (NHRA).

Orientation (situation awareness):

- Embedded in organisational knowledge and job roles
- Situation awareness is based on:
  - What is happening now?
  - What has happened in the past?
  - What will happen in the future?
  - What could go wrong?

Review:

- Can be based on feedback or feedforward
- Checks actions are achieving plans and goals
- Validates situation awareness
- Basis for learning and performance improvement



Goals:

- Specify what we want to achieve
- Focus attention and concentration
- Prime plans

Plans:

- Specify goals behaviourally
- Articulate a sequence of steps
- Need to meet all relevant goals
- Organise and regulate actions

Actions:

- Implement plans
- Can be triggered by cues
- Need to be sequenced

Intuitive decision making is fast and instinctive. It is based on pattern matching, emotion and heuristics (mental shortcuts people use to decide on a course of action). It operates at a subconscious level and operates all the time whether or not we are aware of it.

Analytical decision making is a deliberate and conscious process that can supplement intuitive decision making. It is time consuming and deliberate. It allows more opportunity for accurate sense-making, options analysis, risk assessment, and planning.

Figure 2. Explanation of the IEM-DM Model. Bearman, Drummond, Hayes, Gyles, McLennan, Butler, & Flin (2026). Natural Hazards Research Australia (NHRA).

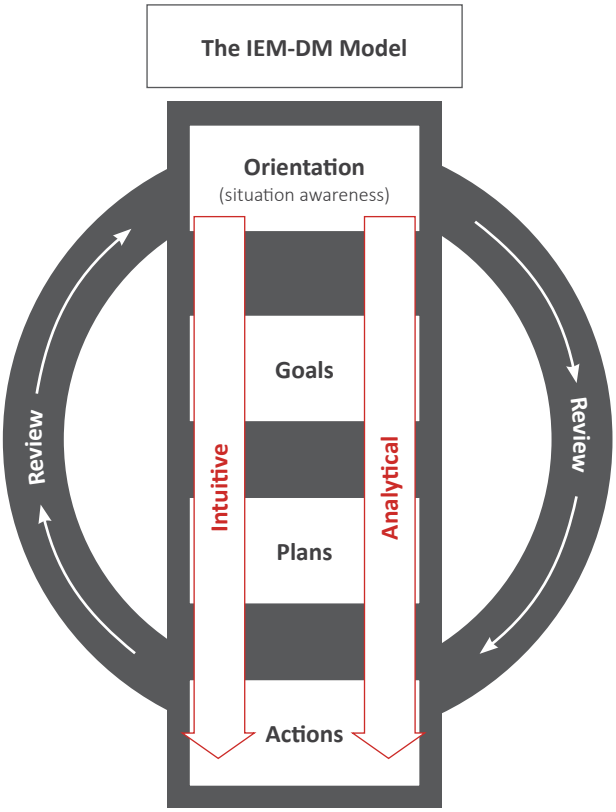
Decision-making pitfalls

Orientation (situation awareness):

- Not knowing what to look for or what it means
- Not understanding how actions can change the situation – requiring update to situation awareness
- Fixation on getting all possible information at the expense of making a decision
- Failing to be aware of what could go wrong
- Lack of a common understanding/common operating picture across personnel
- Failure to recognise there will be blind spots

Review:

- Inadequate to identify the need to change situation awareness goals/plans/actions
- Carried out too often/ prior to actions being able to have effect
- Not critical enough
- Subject to confirmation bias



Goals:

- Unrealistic
- Unachievable
- Cost more than the benefit gained
- Inappropriate preservation

Plans:

- Don't align to relevant goals
- Too complex to be understood
- Too detailed to be actioned
- Multiple plans not appropriately sequenced
- Oscillation between plans

Actions:

- Not enough time to complete
- Missed window of opportunity
- Actions incorrectly sequenced

Intuitive decision making:

- Requires multiple diverse work-related experiences (expertise)
- Over reliance when there is time to apply analytical approaches (shooting from the hip)
- Will continue to completion if not deliberately reviewed ('all-or-nothing' bet that it's working)
- May miss relevant goals
- May not select the best goals, plans, and actions

Analytical decision making:

- Takes time and cognitive resources which may not be available
- May result in inappropriate rumination leading to decision inertia or oscillation
- Reduces ability to Review

Figure 3. Decision-Making Pitfalls and the IEM-DM Model. Bearman, Drummond, Hayes, Gyles, McLennan, Butler, & Flin (2026). Natural Hazards Research Australia (NHRA).

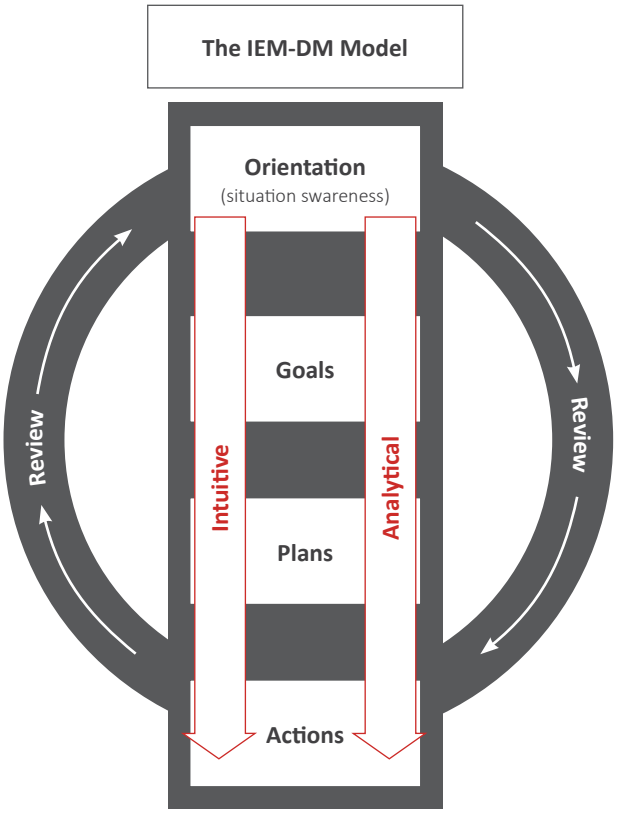
Safeguards against decision-making pitfalls

Orientation (situation awareness):

- Regularly update situation awareness, particularly as the environment changes
- Adopt a 'trust but verify' approach to reported information
- Recognise there will be blind spots
- Ask people if you've missed anything
- Think about worst case scenarios and what they look like
- Don't fixate on getting all possible information at the expense of making a decision
- Make sure everyone has a common understanding / common operating picture

Review:

- Regular active search for cues that may indicate a problem
- Setting expectations about how the incident should develop
- Look for evidence that all is not well
- Use defined measures of success
- Incorporate review sessions in operational timelines



Goals:

- Ensure goals are clear, realistic, and achievable
- Ensure there is more benefit than cost
- Change goals when risk becomes unacceptable

Plans:

- Ensure plans will achieve goals
- Make plans as simple as possible, but no simpler
- Ask people if you've missed anything
- Incorporate contingency options/emergency actions
- Ensure multiple plans are appropriately sequenced

Actions:

- Ensure there is enough time to complete actions
- Ensure actions are executed in the window of opportunity
- Ensure actions are correctly sequenced

Intuitive decision making:

- Ensure that analytical decision making appropriately supplements intuitive decision making
- Ensure that all relevant goals are considered
- Ensure the best goals, plans, and actions are selected
- Engage appropriate review to avoid automatic roll out

Analytical decision making:

- Ensure adequate time and cognitive resources are available
- Avoid inappropriate rumination
- Ensure analytical process don't interfere with effective review

Figure 4. Safeguards Against Decision-Making Pitfalls and the IEM-DM Model. Bearman, Drummond, Hayes, Gyles, McLennan, Butler, & Flin (2026). Natural Hazards Research Australia (NHRA).

Explanation of the cognitive science underpinning the IEM-DM Model

General

- Decision making is fundamentally limited by the structure of our cognitive architecture.
- The model is an expression of activity theory and is based on the key processes of orientation, goals, plans, actions, regulation, and review. The companion report by Drummond et al. (2026) provides more information about the model.
- The framework combines intuitive decision-making processes (e.g. Recognition-Primed Decision Making) and analytical decision-making processes into one framework.
- The IEM-DM model builds upon more than five decades of decision-making research literature and the authors' three decades of operational expertise across fire and emergency services, pre-hospital, and emergency management contexts.
- Each of the key components of the framework are discussed in more detail below.

Orientation and situation awareness

- People search for and interpret information in their environment based on the organisational context, their values, their understanding of their job roles and task, work cultures and their more general understanding of how the world works.
- Consideration of external constraints (such as time and available resources) forms part of the orientation process.
- Interpreting information from the environment into a coherent story about what is happening, what has happened, and what will happen creates situation awareness.
- We can never fully understand everything that is happening in our environment and nor should we try to. Our understanding is only ever partial because situation awareness is based on our own understanding of our world.
- Situation awareness is based on our goals, so we selectively attend to some information and ignore information that we do not perceive as relevant. This means that we will have 'blind spots' and even obvious information that should indicate a problem can be missed.
- Because our situation awareness is based on our own understanding, if we have not seen something before or don't know how to interpret it, then our situation awareness can be faulty or we may not be aware of what may go wrong.
- Everyone's experiences are different so everyone in the team will form slightly different situation awareness. Situation awareness needs to be shared across the team.
- Situation awareness is not a one-off event. Situation awareness requires continual updating as a situation develops.
- Adequate situation awareness may be difficult to form if there is too much, too little, or conflicting information. Actively searching for or filtering information may be necessary.

Goals

- Goals anticipate a future outcome and motivate us towards something we want to achieve.
- Goals focus our attention and concentration towards the achievement of something we desire.
- Committing to a goal is the critical step in moving from a broad wish or intent to concrete action.
- Goals are central to decision making. They prime plans and actions, and influence orientation. They act as a reference point that can be used to measure progress.
- Goals have a many to many relationship with plans. This explains why people sometimes unintentionally substitute one goal for another when they are busy.
- While goals direct behaviour, they are rarely the focus of our conscious attention. Typically, we don't have conversations about goals with other people. We tend to infer goals from people's behaviour.
- Once we've committed to a goal, the goal filters information that we perceive in our environment, which may cause us to build inadequate situation awareness and miss key information.
- There are often multiple goals that must be satisfied by any given plan. In EM these goals may include crew safety, efficient task performance (rescue, extinguishment, etc.), minimising collateral damage, and avoiding environmental contamination. One of these goals will act as the primary goal and drive behaviour.
- Goals are 'sticky' and resistant to change once they are being implemented. The more important the goal, the more 'sticky' it is. This explains inappropriate perseverance with a goal, where trying to achieve one goal (e.g. rescue) leads to neglect of other important considerations (e.g. crew safety).

Plans

- Plans are sequences of steps that specify how a goal should be achieved.
- Plans should be as simple as possible, but no simpler.
- Constraints (such as time and available resources) will influence which plans are selected.
- Once there is commitment to a plan, a decision has effectively been made.
- Multiple plans need to be sequenced effectively.
- Plans may be simple or they may form hierarchies of interrelated plans. If plans are hierarchical, some plans may need to be completed in a particular sequence before other plans can be activated.
- Once we've selected a plan, the associated goal becomes more important. This contributes to the 'stickiness' of goals.
- Less familiar plans may need more conscious deliberation to ensure that they meet all the relevant goals.
- Plans are usually reasonably developed before they are executed through actions but they need not be fully developed. For an expert, a plan may be nothing more than a collection of sub-plan identifiers that trigger actions in real time.
- Novices need to form more detailed plans than experts do. Experts work at a higher level of abstraction than novices.
- An effective way of dealing with failed plans in time constrained situations is to use contingencies. If contingencies are embedded into the plan itself, they can be run relatively automatically if the main plan fails.

Actions

- Actions serve to execute plans.
- Actions need to be carried out in the appropriate time window.
- Implementation intentions are formed that trigger actions when particular cues or events occur in the environment.
- When sets of actions need to be performed to execute a plan or multiple plans are being executed then actions need to be appropriately sequenced. This can be done either concurrently (both actions at once), sequentially (all of one set of actions then another set) or alternatively (interleaved actions).
- Actions need to be appropriately communicated and coordinated with others in the team.

Review

- Review can be based on either feedback or feedforward.
- Review using feedback is where information in the environment is used to determine progress of actions and the extent to which they are meeting plans and goals.
- Review using feedforward is where expectations are generated about what should happen in the future if everything is working as it should.
- Reviews should be carried out at suitable intervals that are not too short or too long.
- Reviews should be formalised in operational timelines where possible.
- Effective review is critical in detecting faulty situation awareness and identifying errors in goals, plans, and actions.
- Feedback generally uses cognitive resources. When people are busy, the cognitive resources required to conduct thorough ongoing review may not be available. This may lead to errors remaining undetected.
- Confirmation bias can distort the review processes leading us to preference information that supports our current situation awareness and the effectiveness of selected goals, plans, and actions. Disconfirming evidence may be inappropriately explained away.
- Significant events that occur in the environment can be pre-identified and used to trigger a deliberate analytical review of performance.

Intuitive and analytical processes

- Orientation, goals, plans, and actions are generally conducted using automatic intuitive processes supplemented where appropriate by more deliberate analytical processes.
- Intuitive processing runs all the time using pattern recognition based on familiarity and regularity. What has been done in the past will be directly applied to the current situation. This may not be the most effective way to solve a current problem.
- Analytical processes can intervene in intuitive processes to ensure more deliberate consideration in relation to orientation, goals, plans, actions, and review.
- Using automatic intuitive processes, we can quickly move from situation awareness to actions.
- Once underway, intuitive processes will run to completion unless there is an intervention by analytical processes.
- Analytical processes require time and cognitive resources, which may not be available. This reduces cognitive resources available for review.
- Analytical processes are often triggered by uncertainty. If the analytical process does not reduce uncertainty, then a loop can occur where there is excessive rumination, leading to oscillation between different goals and/or plans and decision inertia.

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