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CAE MINI-GUIDE 1: ONE-PAGE GUIDANCE

Summary

This document is part of the Declare CAE guidance document set. It contains the one-page guidance on Claims, Arguments, Evidence, and Defeaters.

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1 Introduction

This document contains the "one-page" CAE guidance – it is mini-guide 1 of the CAE guidance set.

2 This mini-guide and the CAE document set

The CAE guidance can be seen as having two main components:

1. **CAE process:** The first component describes an overall process made up of five steps (the "CAE process"), explaining the evolution of a justification within an organisation and the activities involved.
2. **CAE mini-guides:** The second part provides specific technical guidance on the underlying concepts, their definition and their application. We have compartmentalised the technical guidance into "mini-guides": small, dedicated sets of guidance each focusing on a particular issue. Each mini-guide contains a concise summary with a short list of the key points and risks and challenges that need to be considered, which is then supported by more detailed guidance.

The CAE process, and the supporting mini-guides, are summarised in Figure 1 below. This document is highlighted (mini-guide 1).

	Mini-guide
1.	**One-page guidance**
2.	CAE concepts
3.	Formulation of top-level claim
4.	Connection rules
5.	The CAE building blocks
6.	Summarising and communication
7.	Review and challenge
8.	Defeaters

Figure 1: Summary of the CAE process and supporting-mini-guides

The overall CAE process is described in the main CAE guidance document [1]. The process is flexible and adaptable, and depending on the project, only specific phases may be required. The main guide explains the various scenarios of use and how the guidance may apply in different cases. The document also discusses how the mini-guides may be used in different scenarios and at different phases of a project.

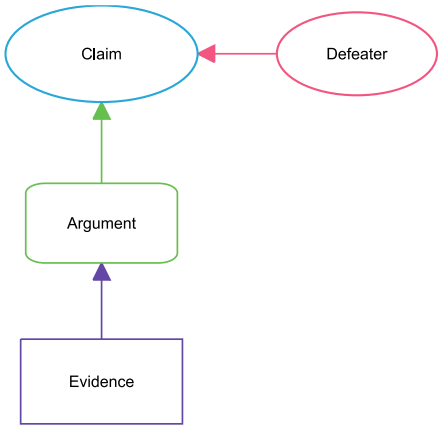
Table 1 below illustrates how this mini-guide (Summarising and communication) applies throughout the CAE process.

CAE steps	Summarising and communicating
Step 1: Familiarisation and training	Review and discussion amongst team members to achieve common understanding and consistency in approach
Step 2: Project start-up	Preliminary top-level claim definition
Step 3: Overview and initial development	Application during development of outline case
Step 4: Interim review and safety case impact assessment	-
Step 5: Development of a more detailed case	Guidance may be used for review and challenge

Table 1: Relationship of this mini-guide to the CAE process

3 One-page guidance

Concepts



Claim. A claim is a true/false statement about a property of a particular object. A claim is exactly what you might consider it to be from common usage of the term; an idea that someone is trying to convince somebody else is true. In the example of the Crane a claim might be, "The crane is safe".

Argument. An argument is a rule that provides the bridge between what we know or are assuming (sub-claims, evidence) and the claim we are investigating. The argument used depends on the type, trustworthiness and extent of available evidence, and the nature of the claim.

Evidence. Evidence is an artefact that establishes facts that can be trusted and lead directly to a claim. In projects there can be many sources of information but what makes one evidence is the support or rebuttal it gives to a claim.

Doubts and Defeaters. A defeater potentially refutes or undermines our confidences in a case: it attacks the justification being made by identifying possible problems with the claims, arguments or evidence that make up the case. An initial doubt can give rise to a defeater, and it may be useful to consider three stages of defeat: (1) initial doubts, when an area of concern is identified; (2) exploratory defeater, where a specific issue has been identified; (3) addressed or accepted defeater, when a defeater has been addressed.

Guidance

Identify the **purpose** of the CAE and the **target audience.**	It should address specific requirements and communicate how this was achieved.
Check that the claim is a **statement that could be true or false.**	Each claim should contain one single statement only. Avoid the use of "and" or "or".
Identify any detailed **context** that is needed for the claims to be understood (e.g., of the plant, operating modes, assumptions, environment) and a description of what the claim refers to.	The context contains the scope of the claim. Remember that a claim may only hold true within the boundaries of that scope definition, so the context itself can be challenged.
Check the claim for **overloaded, vague or ambiguous words** ("safe", "fault", ...).	These may hide anything from further claims to assumptions that must be made clear.
Check that the claim can be **expressed** as "X has property Y".	As above, a claim should be clear and direct, focusing on one object and its property.
Ask why the claim might be valid. The **"because"** will identify the sub-claims that if true support the claim.	What is your rationale for supporting a claim? How are you going to go about explaining why a claim holds true?
Ask what is the general rule that provides the **link** between these sub-claims and the claim (this is the **argument**).	The argument must provide a justification for the selected sub-claims and must explain how they support the claim.
Identify the evidence artefact and the claim that is directly supported by the evidence. If necessary, develop further sub-claims and arguments to link this to the case.	The evidence should be a "thing in the world", e.g., "test report", and should not contain any evaluations in the CAE.
Explain whether the evidence can be **trusted and why.**	How was it developed? What methods and techniques were used? Is it verifiable?
Identify if the evidence is a primary source or has been **derived** from other reports.	If the evidence is not direct it is more difficult to trust it.
Identify potential **defeaters**.	Are all the claims justified? Are there any doubts arising anywhere in the case? Are there any specific issues arising from the arguments or evidence supporting the claims?

Often the top-level claim will not be directly supported by evidence. A number of intermediary argument steps will be needed (see Blocks Guidance).

Note: "Argument" sometimes also refers to, as in ISO15026 and ONR talks, all the CAE structure between the top-level claim and evidence. Potential confusion can be reduced by distinguishing between argument steps and the overall argument.

4 Bibliography

4.1 CAE main-guide

[1] R. Bloomfield, N. Chozos, Declare: CAE Main Guidance and Process, D/1284/43195/2 v1.0, April 2020.

4.2 CAE mini-guides

[2] R. Bloomfield, N. Chozos, P. Sketsiou, CAE Mini-Guide 1: One-page guidance, W/3601/43232/6 v2.0, December 2024 (this document).

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