



New Build Safety Cases, same old problems?

Stephen Kidd, Principal Consultant, CRA



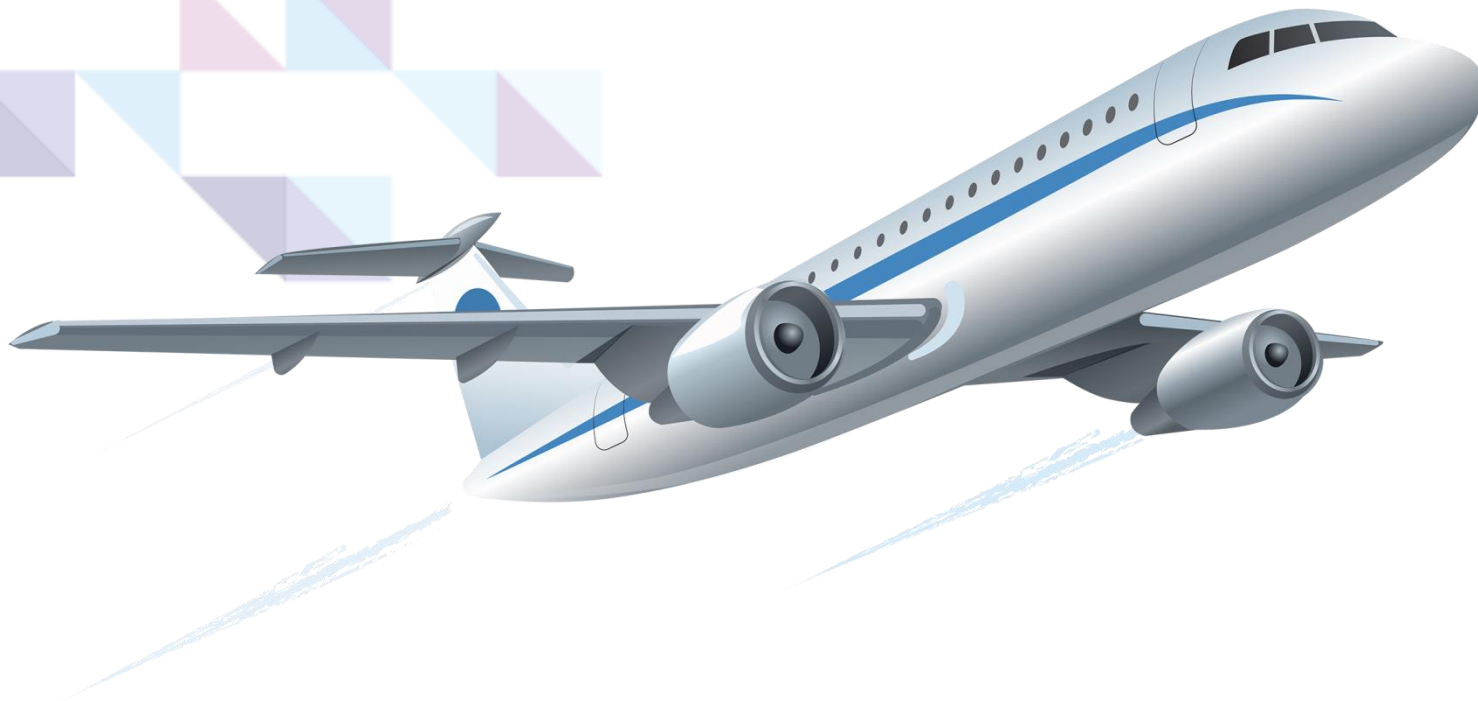
Overview

- Background
- What are the problems and challenges?
- What is new build doing differently?
- What more can we do?

Background

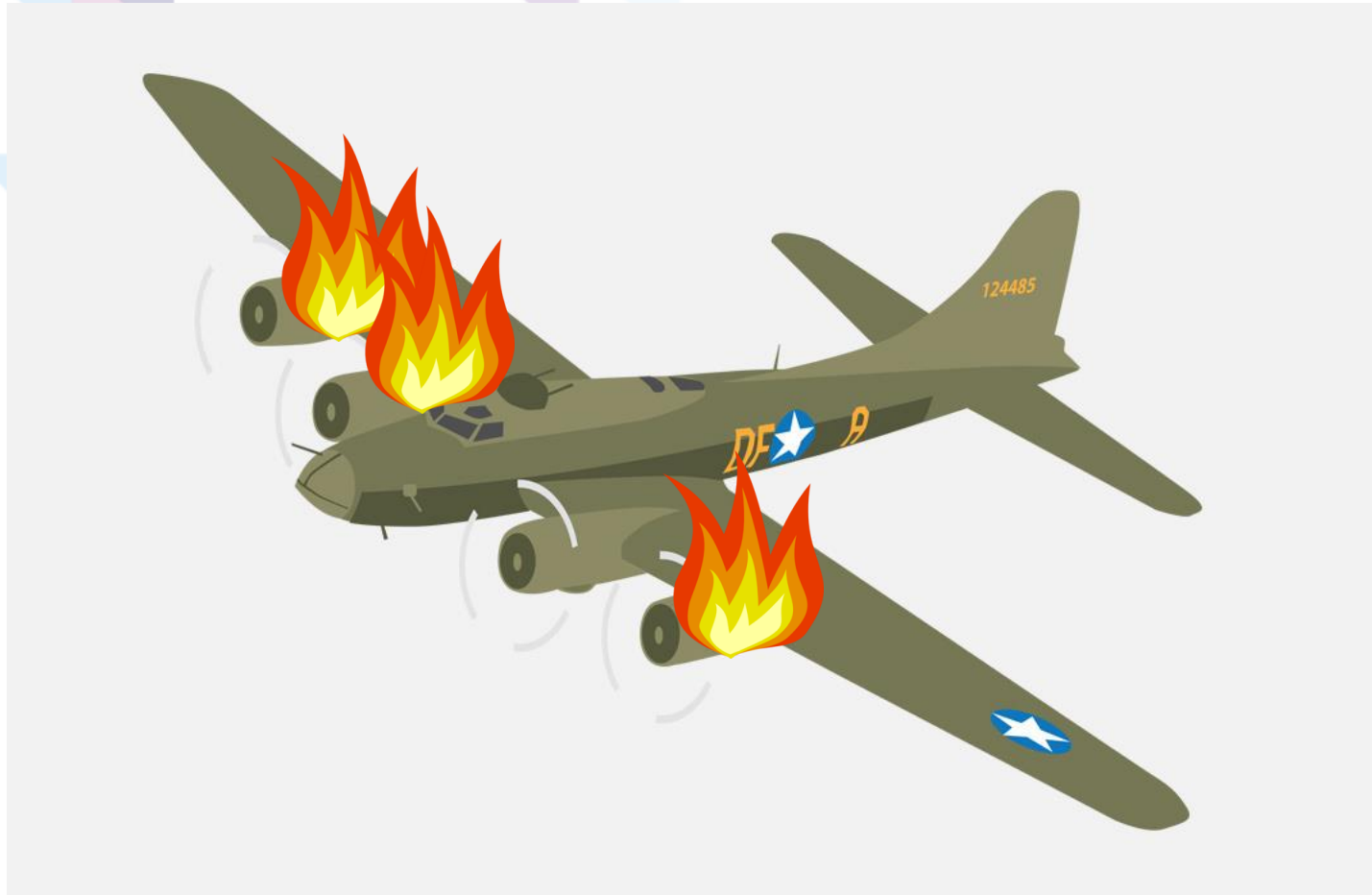
- Key attributes of high quality safety cases include:
 - Auditable
 - Evidential
 - Maintainable
 - Clear, Concise and Intelligible
- Observations that follow focus on delivering these
- Sources of further guidance include:
 - Right First Time Safety Cases: How to write a usable safety case – Safety Directors Forum
 - NS-TAST-GD-051 - The purpose, scope and content of safety cases, ONR
 - The Nimrod Review, Charles Haddon-Cave

New Build Safety Cases



Credit: David Forsythe, Head of Nuclear Safety - Decommissioning, Sellafield Ltd

Existing Facilities Safety Cases



Challenges for existing safety cases

- Challenges maintaining existing cases include
 - Original design basis lost – reinventing the wheel
 - Information not readily accessible
 - Indirect referencing
 - Key knowledge often only in individuals heads
 - Lack of ‘golden thread’
- Significant time, resource and financial burden

So what is the problem then?

- New build is a blank sheet of paper right?
- 'New' doesn't necessarily mean recent
 - Evolutionary designs, foundations laid decades ago
 - Not all data available electronically, lots of paper and more novel or redundant formats
 - Robust configuration control?
 - Some suppliers organisations may no longer exist!
- Even if information is new
 - It may only exist in a foreign language
 - May have been produced in accordance with non-UK requirements
 - There may be Intellectual Property / Export Control issues

So what is the problem then?

- GDA – Requesting party (generally Responsible Designer) produces the PCSR
 - They have the detailed knowledge of the plant performance and the design development and evolution
 - Assumed knowledge an issue
 - Do not necessarily have the UK context
- ‘Lean’ Design Authority
 - Demonstration of IC capability requires prospective licensees capture sufficient data to enable informed decision making, not just through site license application but through life
- Data Capture and management is therefore critical

New Build Safety Cases – Reality



So what is being done?

- Efforts to establish 'golden' thread
- Electronic tools such as databases, MBSE, ASCE etc. are being considered
- Robust review and acceptance processes, including full independent verification
- Claims, Arguments and Evidence adopted where appropriate
- Robust configuration control in place for design and safety case
- Consistent use of unique identifiers and improved referencing
- Key hard copy data is being digitised

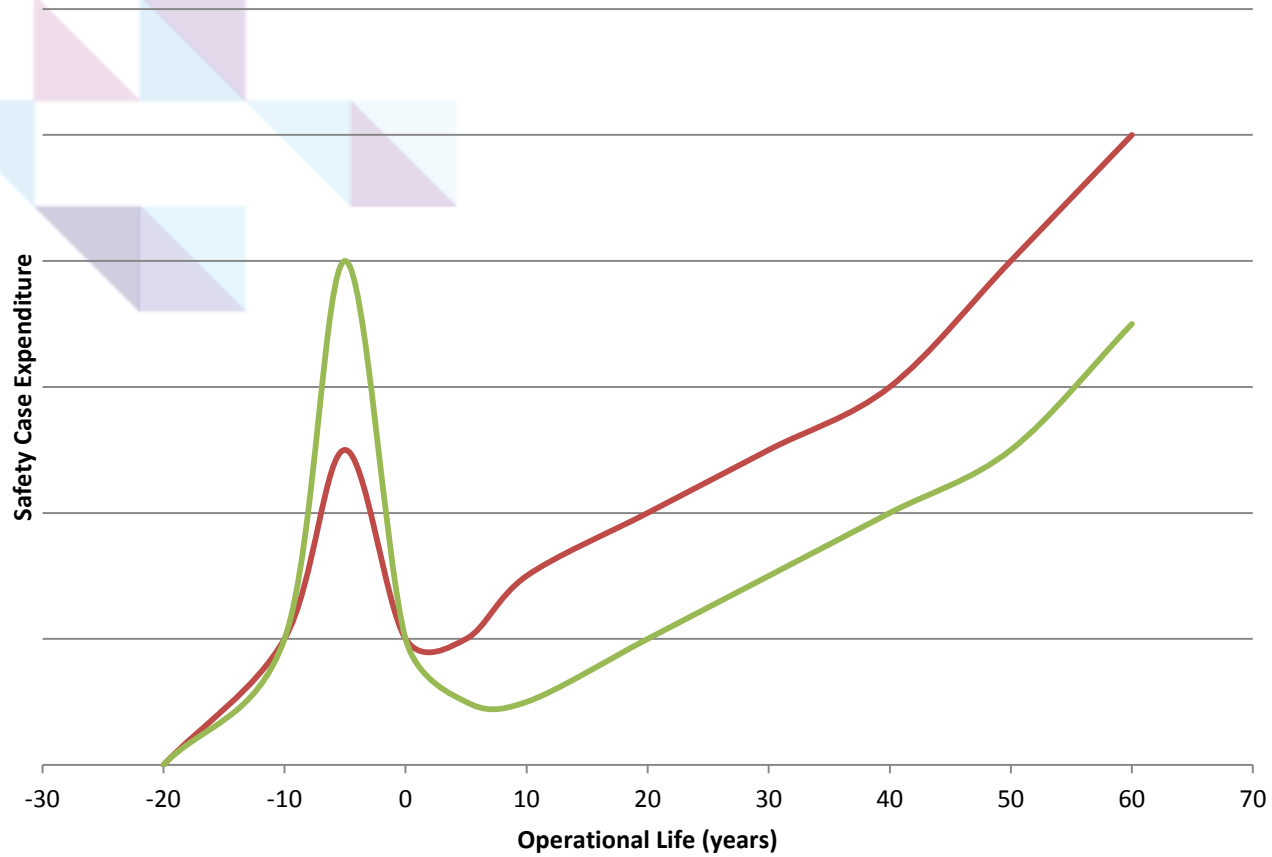
What can safety case authors do?

- Establish and maintain a clear audit trail
- Ensure that the basis of the safety case is fully captured and understood including:
 - Assumptions
 - Basis of engineering judgements
 - Restrictions and limitations of analysis
 - Margins
 - Standards and guidance applied
 - Analysis tools used
- Avoid poor safety case practices such as:
 - Indirect referencing
 - Overly complex claims and arguments

What are some potential benefits?

- Demonstration of IC
- Improved clarity and visibility of the safety case
- Improved operational flexibility
- Ultimately aid decommissioning, fewer surprises
- Through life cost

Through Life Costs



What about SMRs / AMRs?

- Most designs are recent
- Many are being developed outside of the UK
- Opportunity to establish safety case structure and data map early
- Likely to have multiple different operators

Conclusions

- For the moment at least many historical challenges and issues are equally applicable to new build
- Significant opportunity to lay solid foundations now
- Knowledge capture, data management and robust configuration control is essential
- Majority of new nuclear is being developed outside of the UK
- Electronic tools such as databases, MBSE, ASCE etc. definitely have a part to play

And hopefully we will avoid this.....





CRA is a diverse, specialist risk analysis consultancy employing a multi-disciplined team to service the requirements of the safety and mission critical industries.

crarisk.com