

WRITTEN TECHNICAL REPORT

Weighting: 70%

Module: ACMA4039 – Engineering Applications & Study Skills

Assessment: Root Cause Analysis – Technical Report

Student: Emiah Dowling

Student ID: 2203508

Engagement with Literature Skills (15 marks)

Mark awarded: 14 / 15

Emiah demonstrated a very strong engagement with relevant and authoritative literature. The report makes effective use of legislation, professional standards, and sector-specific guidance, including PAS 9980, the Building Safety Act 2022, the Regulatory Reform (Fire Safety) Order 2005, and reports from fire authorities and professional bodies.

The literature is well integrated into the discussion and clearly supports the argument that the Cube fire was a systemic failure rather than an isolated incident. References to Grenfell Tower are used appropriately to contextualise regulatory reform rather than relying on analogy alone.

What was done well

- Excellent selection of current, relevant, and authoritative sources.
- Strong linkage between literature, legislation, and the chosen RCA scenario.
- Clear understanding of professional and regulatory context.

What could be improved

- A small number of academic journal sources could be added to complement regulatory and professional reports.
- Some sources could be synthesised more directly within paragraphs rather than discussed sequentially.

Suggested enhancement

- Add a summary comparison table linking *PAS 9980*, *Building Safety Act 2022*, and *Fire Safety Act 2021* to specific risks identified in the RCA.

Knowledge and Understanding Skills (25 marks)

Mark awarded: 23 / 25

The report shows a very high level of understanding of risk management, RCA methodology, and fire safety engineering principles. Emiah clearly explains the relationship between RCA and Fire Risk Appraisal of External Walls (FRAEW), and demonstrates strong awareness of how material choice, façade design, and regulatory oversight influence fire risk.

The explanation of why internal compartmentation performed well while external systems failed shows mature understanding of building fire dynamics.

What was done well

- Clear and accurate explanation of RCA and PAS 9980 principles.
- Strong understanding of fire spread mechanisms and external wall system risks.
- Effective linkage between technical failures and regulatory context.

What could be improved

- The manufacturing relevance could be made slightly more explicit earlier in the report rather than later.
- A short comparison with alternative RCA tools would add breadth.

Suggested enhancement

- Include a simple system diagram of an external wall system highlighting cladding, cavity barriers, and balcony interfaces.

Cognitive and Intellectual Skills (20 marks)

Mark awarded: 18 / 20

Emiah demonstrated strong analytical and evaluative thinking throughout the RCA discussion. The report clearly explains why the ignition source alone was not the root cause and evaluates the interaction between materials, design, regulation, and human behaviour.

The discussion of detection controls, particularly the limitations of Building Control sign-off, shows critical awareness of systemic weaknesses.

What was done well

- Clear identification of root causes beyond surface-level failure.
- Strong evaluation of regulatory and detection limitations.
- Effective use of RCA results to support conclusions.

What could be improved

- Residual risk following recommended actions could be discussed more explicitly.
- Some evaluation could be supported with more numerical comparison.

Suggested enhancement

- Add a before-and-after RPN comparison chart highlighting the most critical risks and how mitigation reduces them.

Practical Application Skills (20 marks)

Mark awarded: 18 / 20

The application of RCA to a real, complex fire safety incident is a key strength of this report. The RCA table is detailed, well structured, and clearly shows how different risk categories interact. The translation of findings into practical recommendations demonstrates good engineering judgement.

The link between building safety failures and wider industry implications is particularly strong.

What was done well

- Realistic and well-researched RCA scenario.
- Clear linkage between identified causes and corrective actions.
- Strong alignment with PAS 9980 methodology.

What could be improved

- A brief discussion of feasibility, cost, or implementation challenges would add realism.
- Detection controls could be expanded further.

Suggested enhancement

- Include an annotated photograph or schematic of a façade showing fire spread pathways and mitigation points.

Transferable Skills for Life & Professional Practice (20 marks)

Mark awarded: 18 / 20

The report is professionally structured, clearly written, and well presented. The executive summary is particularly effective and clearly communicates the purpose, findings, and implications of the RCA. Figures and appendices are used appropriately and referenced clearly.

What was done well

- Clear, logical structure aligned with the brief.
- Professional tone suitable for industry and regulatory audiences.
- Effective use of appendices to support analysis.

What could be improved

- Minor conciseness improvements in some sections.
- Some figures could be referenced more explicitly in the main discussion.

Suggested enhancement

- Add a final summary flowchart showing *ignition* → *systemic failures* → *RCA* → *mitigation* → *safer outcomes*.
-

Written Report Mark Summary (70%)

Criterion	Mark
Engagement with Literature	14 / 15
Knowledge & Understanding	23 / 25
Cognitive & Intellectual Skills	18 / 20
Practical Application Skills	18 / 20
Transferable Skills	18 / 20
Total (Written Report)	91 / 100

Weighted Contribution to Module (70%):
63.7 / 70