

WRITTEN TECHNICAL REPORT

Module: ACMA4039 – Engineering Applications & Study Skills
Assessment: Root Cause Analysis – Technical Report (70%)
Student: Alfie Sanderson-Jones
Student ID: 2515891

Engagement with Literature Skills (15 marks)

mark: 15 / 15

Alfie demonstrates excellent engagement with literature, exceeding typical Level 4 expectations. The report draws on peer-reviewed academic sources, professional guidance, and standards, including:

- Mahto & Kumar (2008) for RCA theory
- Senders (2004) for FMEA methodology
- Narayanagounder & Gurusami (2009) for critical limitations of RPN
- ISO 31000 and the IMechE Code of Conduct for governance and ethics

Crucially, Alfie does not just describe sources but evaluates them, particularly in Section 4.2 where the limitations of identical RPN values are critically analysed using academic evidence. This level of critique and synthesis fully meets the highest band descriptor.

Knowledge and Understanding Skills (25 marks)

mark: 24 / 25

The report demonstrates very strong conceptual understanding of:

- RCA principles and FMEA methodology
- Severity, Occurrence, Detection, and residual risk
- Proactive vs reactive risk management tools
- Legal and ethical responsibilities of engineers

Alfie clearly explains *why* severity remains unchanged post-mitigation, while occurrence and detection reduce — a point many Level 4 students struggle to articulate accurately. The explanation of malpractice as a residual risk shows mature understanding of professional accountability.

Cognitive and Intellectual Skills (20 marks)

mark: 19 / 20

Alfie demonstrates strong analytical reasoning, particularly in:

- Justifying numerical FMEA scores before and after corrective action
- Explaining why detection and occurrence were not reduced to 1

- Critically evaluating FMEA limitations with numerical examples

The evaluation in Section 4.2 is particularly strong for Level 4, showing independent critical thinking, not rote application. The use of real numerical examples to demonstrate identical RPNs with different risk implications shows advanced reasoning.

Practical Application Skills (20 marks)

mark: 18 / 20

This is a strong real-world industrial application. Alfie uses:

- Real calibration data
- Physical evidence (damaged and repaired gauge images)
- A forward-looking calibration schedule
- Quantified RPN reduction (80 → 20)

The work clearly shows cause–effect–solution linkage, supported by figures and tables. The application is realistic and appropriate for manufacturing engineering practice.

Transferable Skills for Life & Professional Practice (20 marks)

mark: 19 / 20

The report is well structured, professionally written, and clearly laid out. Figures, tables, and appendices are used appropriately and referenced correctly. The conclusion effectively evaluates RCA effectiveness rather than merely summarising.

Minor language repetition prevents a full 20, but overall this is high-quality professional communication.

MARK SUMMARY (70%)

Criterion	Revised Mark
Engagement with Literature	14 / 15
Knowledge & Understanding	24 / 25
Cognitive & Intellectual Skills	19 / 20
Practical Application Skills	18 / 20
Transferable Skills	19 / 20
Total (Written Report)	94 / 100

Weighted contribution (70%): 65.8 / 70