

WRITTEN TECHNICAL REPORT

Weighting: 70%

Module: ACMA4039 – Engineering Applications & Study Skills

Assessment: Root Cause Analysis – Technical Report

Student: Laith Hazell

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Engagement with Literature Skills (15 marks)

Mark awarded: 14 / 15

Laith demonstrated very strong engagement with relevant legislation, professional standards, and authoritative guidance. The report effectively integrates UK health and safety law (HSWA 1974, PUWER, RIDDOR, COSHH), HSE guidance, ISO 45001, and the IMechE Code of Conduct. These sources are clearly linked to the manufacturing context and are used to justify the need for systematic RCA.

The use of industry statistics (fatalities and injuries) strengthens the argument for proactive risk management, and figures are appropriately referenced and discussed.

What was done well

- Excellent selection of relevant legal and professional sources.
- Clear linkage between literature and manufacturing risk management.
- Good use of data to contextualise the scale of risk in the sector.

What could be improved

- Inclusion of a small number of peer-reviewed academic journal papers would further strengthen academic depth.
- Some literature could be synthesised more explicitly rather than discussed sequentially.

Suggested enhancement

- Add a summary table mapping *legislation, standards, and professional codes* directly to specific risks identified in the RCA table.

Knowledge and Understanding Skills (25 marks)

Mark awarded: 23 / 25

The report shows a very strong understanding of risk management principles and RCA methodology. Laith clearly explains why RCA is proactive rather than reactive and demonstrates sound understanding of Severity, Occurrence, Detection, and RPN scoring.

The explanation of why severity remains constant while occurrence and detection change after mitigation shows good conceptual clarity. The integration of PDCA and continuous improvement principles further demonstrates depth of understanding.

What was done well

- Clear and accurate explanation of RCA and RPN methodology.
- Strong understanding of legal, professional, and organisational responsibilities.
- Effective explanation of continuous improvement and monitoring.

What could be improved

- Manufacturing process detail could be introduced slightly earlier to anchor theory more quickly.
- Brief comparison with alternative RCA tools (e.g. Fishbone, 5 Whys) would add breadth.

Suggested enhancement

- Include a simple process flow diagram of the sub-assembly operation highlighting where failures occur.

Cognitive and Intellectual Skills (20 marks)

Mark awarded: 18 / 20

Laith demonstrated strong analytical reasoning when justifying RPN values and explaining how corrective actions led to a 91% reduction in total RPN. The discussion of incorrect torque application, inadequate quality control, and poor shift handovers shows clear prioritisation of risk based on impact and likelihood.

The evaluation of why some risks remain due to human factors shows mature critical thinking.

What was done well

- Clear justification of severity, occurrence, and detection scores.
- Strong interpretation of before-and-after data.
- Good reflection on limitations and residual risk.

What could be improved

- Residual risk could be quantified more explicitly.
- Some evaluations could be tightened to reduce repetition.

Suggested enhancement

- Add a risk ranking summary table highlighting the top three risks before and after mitigation.

Practical Application Skills (20 marks)

Mark awarded: 19 / 20

The practical application of RCA is a major strength of this report. The sub-assembly case study is realistic, clearly described, and supported by a comprehensive RCA table. Corrective actions are practical, proportionate, and clearly linked to identified root causes.

The use of measurable outcomes (total RPN reduction) strongly supports the effectiveness of the proposed actions.

What was done well

- Excellent real-world manufacturing case study.
- Clear linkage between causes, actions, and outcomes.
- Strong use of quantitative data to demonstrate improvement.

What could be improved

- Brief discussion of implementation cost or resource impact would add realism.

Suggested enhancement

- Include an annotated image or schematic of the sub-assembly process showing where key risks occur.

Transferable Skills for Life & Professional Practice (20 marks)

Mark awarded: 18 / 20

The report is professionally structured, clearly written, and logically organised. Figures and tables are well integrated and referenced correctly. The tone is appropriate for both academic and industrial audiences, and the conclusion clearly summarises learning and outcomes.

What was done well

- Clear structure aligned with the brief.
- Effective use of figures and tables.
- Professional, confident writing style.

What could be improved

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

Suggested enhancement

- Add a final summary flowchart showing *issue* → *RCA* → *corrective action* → *risk reduction*.

Written Report Mark Summary (70%)

Criterion	Mark
Engagement with Literature	14 / 15
Knowledge & Understanding	23 / 25
Cognitive & Intellectual Skills	18 / 20
Practical Application Skills	19 / 20
Transferable Skills	18 / 20
Total (Written Report)	92 / 100

Weighted Contribution to Module (70%):
64.4 / 70