

WRITTEN TECHNICAL REPORT

Weighting: 70%

Module: ACMA4039 – Engineering Applications & Study Skills

Assessment: Root Cause Analysis – Technical Report

Student: Aranbeer Moore

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Engagement with Literature Skills (15 marks)

Mark awarded: 12 / 15

Aranbeer showed good engagement with literature relevant to risk management and manufacturing engineering. The report clearly references professional standards and legislation, including the IMechE Code of Conduct, ISO 9001, ISO 31000, and the Health and Safety at Work Act (1974). These sources are relevant and appropriate for the task and demonstrate awareness of the professional and legal context of engineering practice.

The literature is used to support key ideas, such as the role of risk management in reducing workplace incidents and production costs. However, the discussion relies more heavily on organisational and guidance-based sources than on peer-reviewed academic journals.

What was done well

- Appropriate use of professional standards and legislation required by the brief.
- Clear explanation of why risk management is mandatory in manufacturing engineering.
- Literature is relevant and generally well referenced using Harvard style.

What could be improved

- Greater use of academic journal articles would strengthen the scholarly depth.
- More direct comparison between sources would improve critical engagement rather than description.

Suggested enhancement

- Add a summary table comparing ISO 31000, ISO 9001, and IMechE guidance, outlining purpose, focus, and relevance to RCA. This would strengthen synthesis and clarity.

Knowledge and Understanding Skills (25 marks)

Mark awarded: 20 / 25

The report demonstrates a very good understanding of RCA, FMEA, and risk management principles within manufacturing engineering. Aranbeer clearly explains severity, occurrence, detection, and RPN scoring, and applies these concepts correctly to the hydraulic press case study.

The discussion of professional responsibility and legal compliance shows clear understanding of how engineering decisions affect safety, quality, and reliability.

What was done well

- Clear explanation of RCA and FMEA scoring methodology.
- Strong understanding of legal, ethical, and professional obligations.
- Good explanation of how risk management supports safety and cost control.

What could be improved

- Some explanations remain descriptive rather than analytical.
- Deeper discussion of how RCA supports decision-making at organisational level would improve depth.

Suggested enhancement

- Include a process flowchart showing the RCA stages from failure identification through to revised RPNs.

Cognitive and Intellectual Skills (20 marks)

Mark awarded: 16 / 20

Aranbeer demonstrated good analytical reasoning when explaining the justification of severity, occurrence, and detection ratings. The explanation of why certain failures were rated more highly (e.g. arm ejection risks and internal leaks) is logical and clearly linked to safety and downtime impacts.

The evaluation of mitigating actions is supported by numerical reductions in RPN, which strengthens the analysis.

What was done well

- Clear reasoning behind ranking decisions.
- Logical explanation of why different failures carried different levels of risk.
- Effective use of numerical data to show improvement after mitigation.

What could be improved

- Greater comparison between different mitigation strategies would strengthen evaluation.
- More explicit discussion of residual risks would enhance critical depth.

Suggested enhancement

- Add a before-and-after comparison table summarising key failure modes and their RPN reductions.

Practical Application Skills (20 marks)

Mark awarded: 18 / 20

The RCA application to a rotary hydraulic press is strong and well suited to the manufacturing context. The FMEA table is detailed and realistic, showing multiple failure modes, causes, controls, and corrective

actions. The selection of engineering controls, such as depth gauges and routine inspections, demonstrates sound practical judgement.

What was done well

- Strong real-world industrial case study.
- Detailed and realistic FMEA table.
- Correct application of preventive and engineering controls.

What could be improved

- Detection controls could be expanded further (e.g. automation or digital monitoring).
- Some corrective actions could be prioritised more clearly based on risk severity.

Suggested enhancement

- Include a simplified FMEA summary table in the main body highlighting the top 3 highest-risk failure modes.

Transferable Skills for Life & Professional Practice (20 marks)

Mark awarded: 16 / 20

The report is logically structured and follows the technical report format stated in the brief. Headings are clear, and the flow from literature to methodology, results, and conclusion is coherent. Figures and tables are appropriately referenced, including the RPN comparison chart.

What was done well

- Clear structure aligned with the assignment brief.
- Appropriate technical tone.
- Effective use of figures to support discussion.

What could be improved

- Some repetition could be reduced for conciseness.
- Minor grammatical and formatting issues slightly affect fluency.

Suggested enhancement

- Add a final summary diagram showing *failure* → *RCA* → *mitigation* → *outcome* to strengthen professional communication.

Written Report Mark Summary (70%)

Criterion	Mark
Engagement with Literature	12 / 15
Knowledge & Understanding	20 / 25
Cognitive & Intellectual Skills	16 / 20

Criterion	Mark
Practical Application Skills	18 / 20
Transferable Skills	16 / 20
Total (Written Report)	82 / 100

Weighted Contribution to Module (70%):
57.4 / 70