



Aerospace systems 2025 v1.2

IA1: Sample assessment instrument

This sample has been compiled by the QCAA to assist and support teachers in planning and developing assessment instruments for individual school settings.

Student name	sample only
Student number	sample only
Teacher	sample only
Issued	sample only
Due date	sample only

Marking summary

Criterion	Marks allocated	Provisional marks
Symbolising and Communicating	7	
Determining and Generating	9	
Synthesising and Evaluating	9	
Overall	25	

Conditions

Technique	Aerospace solution
Unit	Unit 3: Aerospace ecosystems
Topic/s	Topic 1: Aerospace regulatory systems Topic 2: Human performance Topic 3: Safety management systems and human factors Topic 4: Operational accident and incident investigation processes Topic 5: Airport and airline operation systems
Duration	Approximately 10 hours of class time
Mode / length	Written and visual: <ul style="list-style-type: none">• up to 10 A4 pages, including<ul style="list-style-type: none">– up to 2000 words– images, graphs, calculations and diagram
Individual / group	Individual
Other	Students can develop their responses in class time and their own time.

Context

A regional airline, Realway, is considering reducing its flights from a coastal town (CT) because of a 50 per cent drop to 62,300 passengers over the previous 12-month period. Realway found this route is not profitable, as many CT flights are well under capacity.

Use of a hub and spoke aviation transportation system at CT means that almost all Realway's short-range jet aircraft (with single-class seating and capacity for 100 passengers) fly on spokes between CT and a hub city airport, offering very few or no direct flights to other regional towns.

Regional airports near CT (flying distance)

- The closest regional airport is 235 kilometres away.
- There are six regional airports within 500 kilometres and another eight within 800 kilometres.
- The hub city airport is 875 kilometres away.

Realway currently operates two flights to and from CT every weekday, with half as many flights on Saturdays and Sundays.

Passengers are often required to spend many hours travelling to and from the hub city airport enroute to their final destination. This has caused a lot of frustration and resulted in many customers choosing to find alternative transportation that is more convenient and cost-effective.

Realway requires an equitable solution to this operational problem. One that will meet the needs of the CT travelling public and enable Realway to operate at a net profit of \$100.00 per passenger across routes Realway services.

Task

Your task is to use the problem-solving process in Aerospace Systems to:

- develop a solution to Realway's CT Aerospace ecosystems problem
- document the problem-solving process used to develop and propose a solution including:
 - aircraft types, range, passenger yield and load factor while maintaining the highest level of customer safety.
 - recommendations regarding the minimum flight distance between towns to provide a revenue available seat kilometre (RASK) basis for making decisions about route viability, including cost of available seat kilometre (CASK)
 - evaluations of Realway's current and proposed future service to customer model
 - considerations of an increase in profitability rather than a decrease in customer service.

To complete this task, you must:

- symbolise and explain the incorporated aerospace systems, the development of ideas and the solution with visual frameworks, causal and feedback loops, flow charts, diagrams, sketches and/or pictures
- determine a success criteria considering the identified elements, components and features, and their relationship to the structure of the aerospace operational systems problem
- synthesise aerospace systems, technology, and research information, and ideas to propose a possible solution to the aerospace operational systems problem

- generate the proposed solution for the aerospace operational systems problem, and testing, simulating or hypothesising to provide data (e.g. pictures, tables, surveys, interview recordings, audio-visual recording) for evaluation including (if applicable) annotated photographs or screen captures of the solution prior to and after testing, simulating or hypothesising
- evaluate and refine ideas and the solution for the aerospace operational systems problem in relation to success criteria
- recommend and justify future modifications or enhancements to ideas and the solution to the aerospace operational systems problem
- communicate the development of ideas and the solution for the aerospace operational systems problem using written and visual features, e.g. PMI (plus, minus, interesting) charts, tables, pictures, bubble diagrams, feedback loops
- communicate data using diagrams, tables and/or spreadsheets.

Checkpoints

- ☐ Term 1 Week 7: Submit a draft demonstrating success criteria determined from the problem, the development of ideas and an indication of a proposed solution.

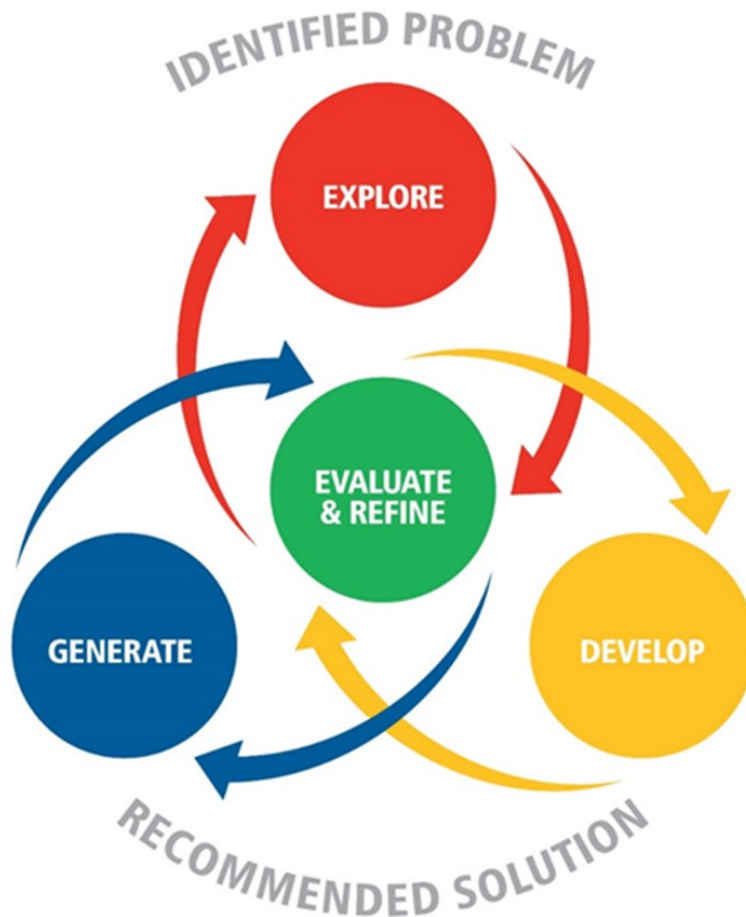
Authentication strategies

- You will be provided class time for task completion.
- You will produce sections of the final response under supervised conditions.
- You will each produce a unique response with the teacher monitoring how you identify the problem and problem solve.
- You will provide documentation of their progress at indicated checkpoints.
- Your teacher will conduct interviews or consultations with each student as you develop the response.
- You must acknowledge all sources.
- You must submit a declaration of authenticity.
- Your teacher will ensure class cross-marking occurs.
- Your teacher will compare the responses of students who have worked together in groups.

Scaffolding

In this unit, you are required to document the development of a solution using the problem-solving process in Aerospace Systems in response to an identified real-world aerospace problem.

The problem-solving process in Aerospace Systems



Your response should include the following conventions:

- headings that organise and communicate your thinking through the iterative phases of the problem-solving process in Aerospace Systems
- a table of contents
- a reference list and a recognised system of in-text referencing.

Instrument-specific marking guide (IA1): Aerospace solution response (25%)

Symbolising and Communicating	Marks
The student response has the following characteristics:	
<ul style="list-style-type: none"> • adept symbolisation and discerning explanation of ideas, a solution and relationships in relation to aerospace management, safety, and airline and/or airport operations with <ul style="list-style-type: none"> – visual frameworks and flow charts – causal and feedback loops – diagrams and sketches and/or pictures • discerning decision-making about, and proficient use of <ul style="list-style-type: none"> – written and visual features to communicate about a solution – language for a technical audience – grammatically accurate language structures – referencing conventions 	6–7
<ul style="list-style-type: none"> • effective symbolisation and considered explanation of ideas, a solution and relationships in relation to aerospace management, safety, and airline and/or airport operations with <ul style="list-style-type: none"> – visual frameworks and/or flow charts – causal and/or feedback loops – diagrams and/or sketches and/or pictures • effective decision-making about, and fluent use of <ul style="list-style-type: none"> – written and visual features to communicate about a solution – language for a technical audience – grammatically accurate language structures – referencing conventions 	4–5
<ul style="list-style-type: none"> • competent symbolisation and appropriate explanation of some ideas, a solution and relationships in relation to aerospace management, safety, and airline and/or airport operations with <ul style="list-style-type: none"> – visual frameworks and/or flow charts – causal and/or feedback loops – diagrams and/or sketches and/or pictures • appropriate decision-making about, and use of <ul style="list-style-type: none"> – written and visual features to communicate about a solution – suitable language – grammatically accurate language structures – referencing conventions 	2–3
<ul style="list-style-type: none"> • inconsistent symbolisation or superficial explanation of aspects of ideas, a solution, or relationships in relation to aerospace management, safety, and airline and/or airport operations • inconsistent decision-making about, and inconsistent use of <ul style="list-style-type: none"> – written and visual features – suitable language – grammar and language structures – referencing conventions. 	1
The student response does not satisfy any of the descriptors above.	0

Determining and Generating	Marks
The student response has the following characteristics:	
<ul style="list-style-type: none"> • astute determination of essential success criteria for the operational systems problem • proficient generation of a solution, including <ul style="list-style-type: none"> – aerospace management – safety – airline and/or airport operations • provide valid data to critically determine the feasibility of a solution 	8–9
<ul style="list-style-type: none"> • reasoned determination of effective success criteria for the operational systems problem • effective generation of a solution, including <ul style="list-style-type: none"> – aerospace management – safety – airline and/or airport operations • provide valid data to effectively determine the feasibility of a proposal 	6–7
<ul style="list-style-type: none"> • logical determination of appropriate success criteria for the operational systems problem • adequate generation of a solution, including <ul style="list-style-type: none"> – aerospace management – safety – airline and/or airport operations • provide relevant data to determine the feasibility of a proposal 	4–5
<ul style="list-style-type: none"> • reasonable determination of some success criteria for the operational systems problem • partial generation of a solution, including <ul style="list-style-type: none"> – aerospace management – safety – airline and/or airport operations • provide elements of data to partially determine the feasibility of a proposal 	2–3
<ul style="list-style-type: none"> • statements about some success criteria for the operational systems problem • generation of elements of a solution. 	1
The student response does not satisfy any of the descriptors above.	0

Synthesising and Evaluating	Marks
The student response has the following characteristics:	
<ul style="list-style-type: none"> coherent and logical synthesis of relevant aerospace systems, technology and research information, and ideas to propose a possible solution, including <ul style="list-style-type: none"> aerospace management safety airline and/or airport operations solution critical evaluation of ideas and a solution using success criteria discerning refinement of a solution to make astute recommendations justified by data and research evidence 	8–9
<ul style="list-style-type: none"> logical synthesis of relevant aerospace systems, technology and research information, and ideas to propose a possible solution, including <ul style="list-style-type: none"> aerospace management and/or safety airline and/or airport operations solution reasoned evaluation of ideas and a solution using success criteria effective refinement of a solution to make considered recommendations justified by data and research evidence 	6–7
<ul style="list-style-type: none"> simple synthesis of aerospace systems, technology, and research information and ideas to propose a possible solution, including <ul style="list-style-type: none"> aerospace management and/or safety airline and/or airport operations solution feasible evaluation of ideas and a solution using success criteria adequate refinement of ideas and a solution to make fundamental recommendations justified by data and research evidence 	4–5
<ul style="list-style-type: none"> rudimentary synthesis of partial aerospace systems, technology, or research information and/or ideas to propose a possible solution, including <ul style="list-style-type: none"> aerospace management or safety or airline and/or airport operations solution superficial evaluation of ideas or a solution using some success criteria to make elementary recommendations 	2–3
<ul style="list-style-type: none"> unclear combinations of information or ideas identification of a change about an idea or the solution. 	1
The student response does not satisfy any of the descriptors above.	0



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