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Department of Defence
Defence Aviation Safety Authority

Operations at Elevated Airworthiness Risk: Safety Assurance under EMAR

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Outline

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- EMAR and elevated risk
- Understanding our credibility and defensibility
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  - Methodology
  - Results
- Initial observations
- Next steps
- Closing thoughts

Context: Current situation in Australia

- Australia adopted EMAR as the Initial and Continuing Airworthiness elements of the Defence Aviation Safety Regulation (DASR) in 2016.
- The DASR is the only applicable airworthiness regulation suite for all Defence aviation platforms.
- DASA is required to implement a safety program that (*inter alia)*:
  - independently assures the effective management of aviation safety risks
  - enables commanders to fully exploit aviation capabilities.

EMAR and elevated risk

- The EMAR provides a great basis for a common airworthiness framework.
- EMAR retains civil requirements for the operation of aircraft:
  - A valid Certificate of Airworthiness (CoA) is required for operation
  - CoA are issued by the Authority
  - Military Permit to Fly provisions are the same as the civil equivalent.
- Governments require their militaries to carry out aviation activities at higher levels of safety risk than is acceptable in commercial air transport.

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Understanding our credibility and defensibility

- As our national implementation of EMAR matures, Australia is seeking to clarify the role of the Authority in situations involving elevated airworthiness risk.

- In lieu of an international standard, we are looking to other national approaches to answer the question:

What does independent safety assurance look like for operations at elevated airworthiness risk?

Study - Participating nations

- Nations invited to contribute:
  - nations that attended the UK Defence Aviation Safety Conference in Apr 19
  - nations having mutual recognition with Australia.

- Nations participating: AUS, CAN, DEU, FRA, GBR, NLD, NZL

- Each contributing nation retains full control over the publication of results specific to that nation.

Study - General Applications by MAAs

- **Application 1:** Operation before full type certification
  - Timeframe: months to years.
- **Application 2:** Semi-urgent operation outside approved type design (i.e. MPTF)
  - Timeframe: days to months
- **Application 3:** Urgent operation outside approved type design or operational limits
  - Timeframe: Immediate to same day

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Study - Methodology

- We asked MAAs to:
  - provide documentation describing their national flexibility provisions, and
  - participate in a series of interviews to assist our understanding.
- Flexibility provisions are characterised in terms of:
  - People…who approves, who retains the risk?
  - Process…who prescribes the process?
  - Product…are formal instruments used?
- In each instance, we asked:
  - What is the role of the regulated community?
  - What is the role of the independent safety authority?

Study – Initial results

- As a ‘first pass’ we have attempted to quantify the relative level of independent safety assurance applied by the Authority in each application

- However, this assessment remains subjective because:
  - independent assurance comes at a cost. More is not better (or even possible)….it’s just different
  - the levels of independent assurance sought will be influenced by nations’ social and legal context
  - the strength of safety culture and levels of assurance conducted within the Command Chain are also critical factors

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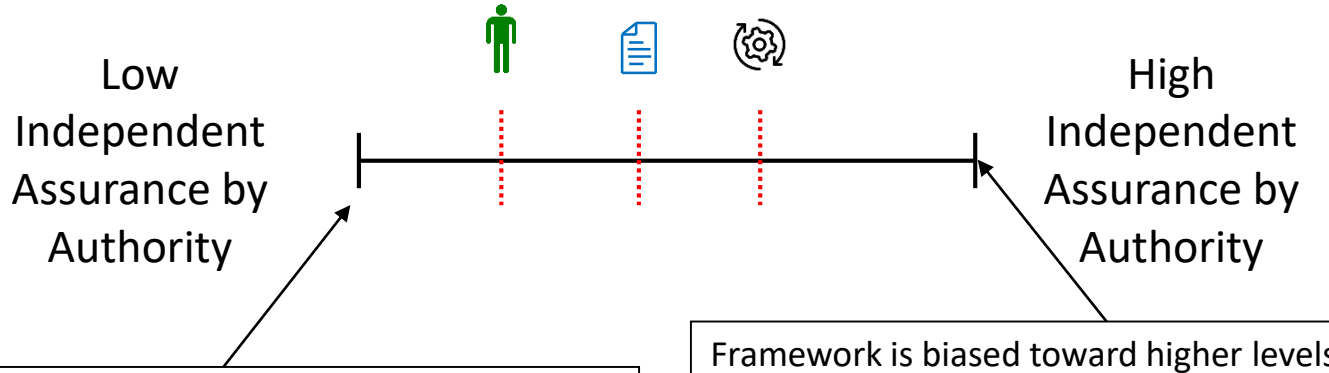
Study – Initial results



Framework is biased toward regulated community autonomy.

Safety Authority applies little or no assurance.

Community determines:

- who can make decisions
- process requirements
- what artefact is necessary, if any.

Framework is biased toward higher levels of independent safety assurance.

Regulated community generally remains responsible for safety.

- Decision-makers are subject to Authority acceptance.
- Process is prescribed by the Authority.
- Operation requires an Authority instrument.

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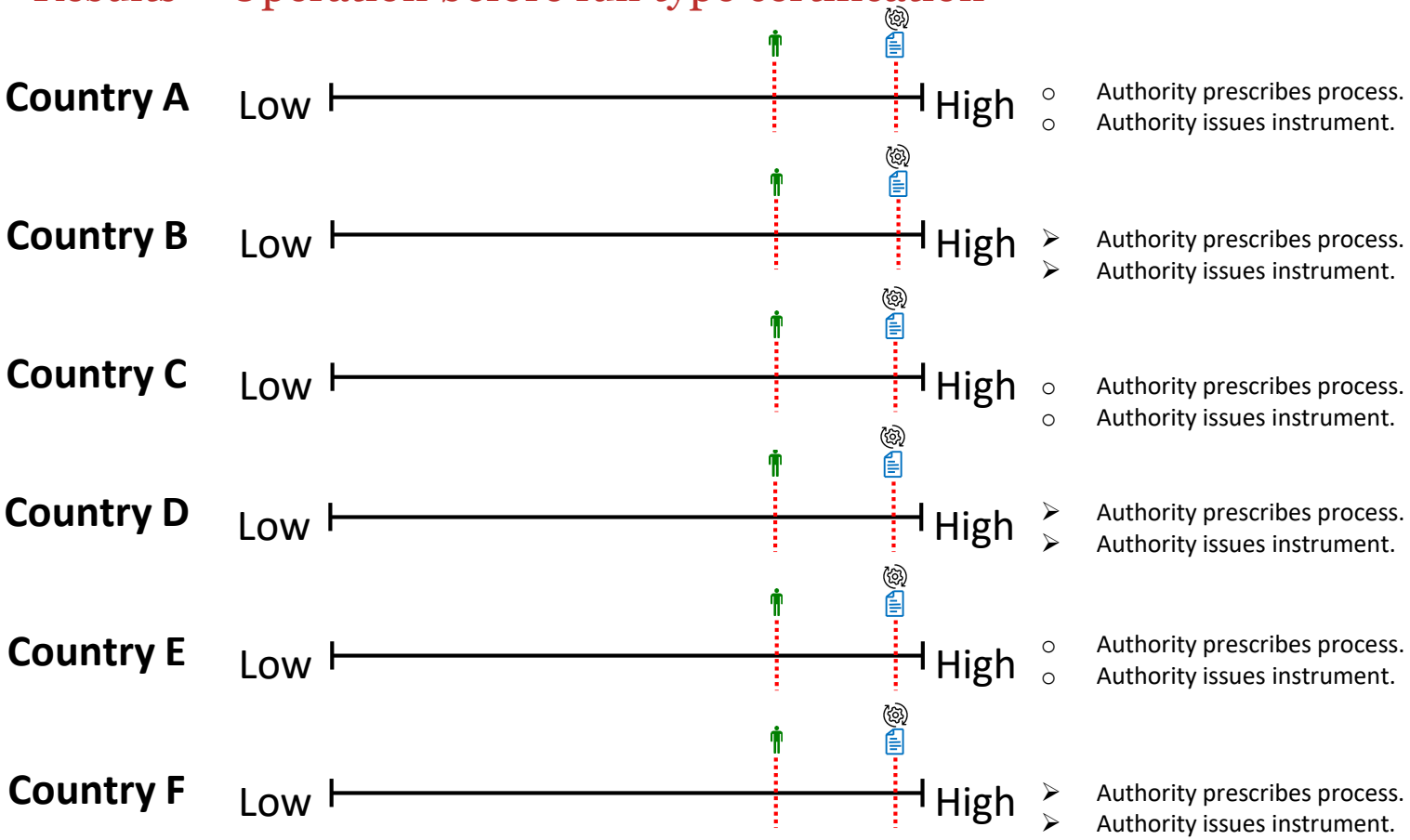
Legend
Product
Process
Personnel

Results – Operation before full type certification



- Authority prescribes process.
- Authority issues instrument.

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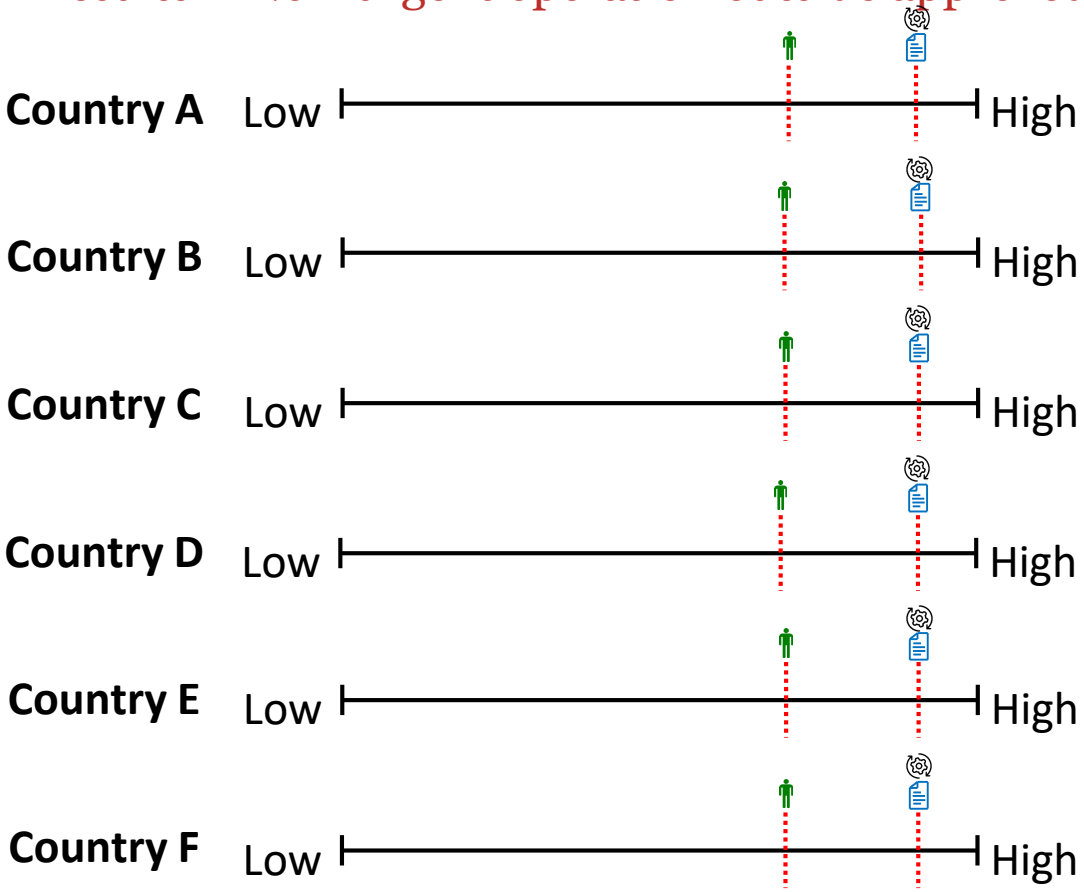
Legend
- Product
- Process
- Personnel

Results – Non-urgent operation outside approved type design (i.e. MPTF)



- Country A
  - Authority prescribes process.
  - Authority issues instrument.
- Country B
  - Authority prescribes process.
  - The Type Certificate holder may authorise deviations from the Approved Maintenance Program
- Country C
  - Authority prescribes process.
  - Authority issues instrument.
- Country D
  - Authority prescribes process.
  - Authority issues permit to fly, operators issue Permits to Fly under the authority's approval.
- Country E
  - Authority prescribes process.
  - Authority assures the suitability of applicant.
- Country F
  - Authority prescribes process.
  - Authority issues instrument.

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Legend
Product
Process
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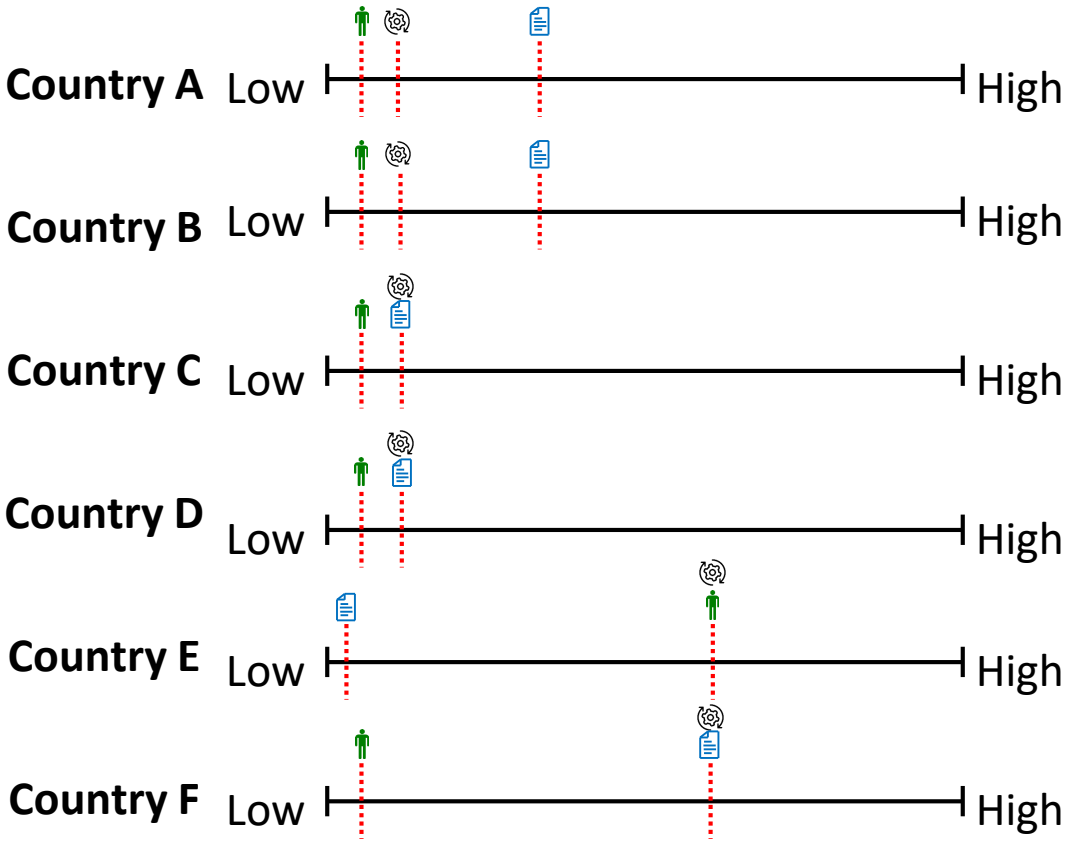
Results – Urgent operation outside approved type design or operational limits



- Decisions are independently reviewed retrospectively.
- Operator's process is oversighted by Authority.

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- Processes defined by the Operator.
- Operator issued artefacts are not prescribed by the Authority.
- Chief of Service issues permit based on Authority advice.

- Operator defines process.
- Authority defines conditions for return to airworthiness framework

- Specific process requirements prescribed by Authority.
- Authority assures suitability of decision-maker.

- Artefacts and process prescribed by Authority.

Initial observations

- Each participant's national framework includes provisions to:
  - Bring platforms into service prior to certification
  - Permit the operation of aircraft with defects, supported by Authority advice
  - Enable the immediate operation of non-airworthy aircraft when necessary
- The majority of flexibility provisions are temporary (except for changes to the certification basis).
- It's difficult to capture national differences in aspects such as legislation and culture in the results.

Initial observations

- The greatest variation in national approaches was found in the case of urgent operation outside approved type design or operational limits. In particular, countries E and F place the most prescriptive requirements on related processes.

- The approach of each participant concerning time-critical flexibility provisions is quite consistent. Should such provisions be included in EMAR in the future?

- The study responses revealed differing notions as to whether the Authority, when issuing an approval for operation at elevated risk, ‘retains’ some of that risk itself.

Initial observations – an AU difference?

- In the Australian system, hazards identified through in-service incidents/occurrences are sometimes managed under the DASR SMS Regulation 25.b2 ‘Risk Management’
- Safety risks are managed through the in-service System Safety Program, e.g. using a hazard log, with DASA applying minimal independent assurance.
- Do other nations use a similar approach?
- We will ask further questions to the participants to understand how this is done, and the relationship with formal airworthiness instruments.

Next steps

- Results are being compiled into a report which will be provided to participant nations.

- The credibility and defensibility of the Australian flexibility provisions will be critically assessed in light of:
  - other national approaches, and
  - Australian legislative requirements.

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Closing thoughts

With only civil aviation safety standards as a reference, it is up to us as MAAs to share information to enable each other to assess the credibility and defensibility of our own military airworthiness frameworks.

QUESTIONS