

RA 1207 - Air Safety Data Management and Exploitation

Rationale

Demonstrating that an Air System▶◀ is safe to operate and being operated safely, chiefly through the Air System Safety Case¹ (ASSC), relies upon the effective management of Air Safety▶◀ data as part of an Air Safety Management System² (ASMS). Without a coherent approach to the management and exploitation of this data to routinely validate the continued veracity of ASSC claims, sustaining and delivering improvements in Air Safety may not be achieved and Safety may be compromised with an associated increase in Risk to Life▶◀ and loss of capability. This RA requires ASMS owners to introduce and maintain a coherent approach to the management of Air Safety data for each Air System, including collection, exploitation, Assurance and Configuration Management.

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Regulation

1207(1)

Air Safety Data Exploitation Strategy

1207(1) Operating Duty Holders (ODH) / Accountable Managers (Military Flying) (AM(MF)) **shall** ensure an Air Safety data exploitation strategy is developed and implemented for each Air System type within their Area of Responsibility (AoR).

Acceptable Means of Compliance

1207(1)

Air Safety Data Exploitation Strategy

1. The strategy **should** detail how defined Air Safety data is collected, analyzed, validated and exploited in support of continually assuring the validity of associated ASSC claims and arguments, ▶ and outline opportunities to use Air Safety data to enhance Safety outcomes. ◀
2. The strategy **should** embed Air Safety data exploitation as an essential element of ODH / AM(MF) and subordinate ASMSs, requiring that responsibilities for data collection, analysis and Validation are clearly defined in appropriate documentation▶◀.
3. The strategy **should** apply the requisite principles of data governance for managing ▶ and exploiting◀ data as defined in ▶ both◀ JSP 441³ ▶ and JSP 453⁴, ◀ ensuring that Quality management arrangements are included within Assurance processes.
4. The strategy **should** require that appropriate contractual agreements are in place to secure access to the necessary data and services from industry and external organizations to enable delivery of the strategy's intent.

Guidance Material

1207(1)

Air Safety Data Exploitation Strategy

5. The following is a pertinent description encapsulating the intent of this Regulation▶◀:

“Data is simply raw facts and figures, alone it tells you nothing. The goal of any organization is to turn data into trustworthy information. Data becomes information when it is presented in a context so that it can answer a question or support decision-making and it is when this information can be combined with a manager’s knowledge that stronger decisions can be made.”▶⁵◀

ODH / AM(MF) Air Safety Data Exploitation Strategies

6. The ▶◀ Air Safety data exploitation strategy ▶ will detail◀ specific aims and objectives ▶◀. It will describe the type of Air Safety data to be assembled and managed to meet these aims and objectives, identify the roles responsible within the

¹ Refer to RA 1205 – Air System Safety Cases.

² Refer to RA 1200 – Air Safety Management.

³ Refer to JSP 441 – Information, Knowledge, Digital and Data in Defence. External organizations without direct access ▶ need◀ to follow the UK’s Data Protection Legislation and relevant contractual conditions.

⁴ ▶ JSP 453 – Digital Policies and Standards for Defence - Chapter 3 Exploitable by Design. External organizations requiring guidance from MOD documents produced outside the MAA can gain access through their relevant MOD Sponsor. ◀

⁵ Extracted from 2020 edition of JSP 441: Data management.

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appropriate subordinate supporting organizations, and outline the Assurance processes employed to assess compliance with the strategy. It will contribute to the establishment and sustainment of an organizational culture that recognizes the value of effectively exploiting Air Safety data as part of an ASMS in support of the ASSC.

Air Safety Data Exploitation Strategy Contents

7. A strategy will, as a minimum, cover the following topics:
- a. **Objectives.** Set out the Air Safety data exploitation objectives and the activities needed to support them. ► **Consider** ◀ the full range of personnel across the AoR who contribute to Air Safety ► **whilst** ◀ developing data requirements including: operations, Maintenance, battlespace management and support staff, to ensure that all facets of the ASSC are adequately addressed. In addition to direct support of an ASSC as part of an ASMS, exploitation objectives could also include wider aspects such as increasing operational effectiveness or efficiency. The Manual of Air System Safety Cases (MASSC)⁶ provides some examples of data exploited in support of ASSC claims.
 - b. **ASMS Integration.** The strategy in addressing the full ASSC will span multiple organizations and their ASMSs. Therefore, the strategy will require that interfaces between the systems and organizations involved in delivery are adequately considered, including industry, Defence Equipment and Support (DE&S) and other Aviation Duty Holder (ADH)-Facing organizations. Formal commercial arrangements may be necessary to secure access to required technical detail or specialist services.
 - c. **Assurance.** Ensure that appropriate requirements are met for effective data management, including data Quality, integrity and availability, such that confidence in the data can be assured ► **3,4** ◀.
 - d. **Roles and Responsibilities.** Identify the required roles in the relevant procedures to ensure Accountability and clear boundaries of Responsibility for Air Safety data management and exploitation, including:
 - (1) Ownership.
 - (2) Collection.
 - (3) Analysis.
 - (4) Validation.
 - (5) Exploitation.
 - (6) Assurance.
 - (7) Configuration Management and retention.

Examples of individuals and organizations involved in exploiting Air Safety data are shown at Annex A which outlines the broad categories of data and potential uses.

8. It is not the intent of the strategy to require unnecessary replication of existing MRP requirements, but to ensure signposts are in place to highlight the relevant dependencies⁷.

Multiple Air Systems and Operators

9. Where one type of UK military registered Air System is operated by more than one ODH / AM(MF), the ODHs / AM(MF)s concerned will need to agree and document arrangements for their roles in defining and implementing coherency in the Strategies, with appropriate links to their respective ASMS. Similarly, where ODHs / AM(MF)s are using Types operated by other civil or international users, they ► **will** ◀ endeavour to participate in shared Air Safety data exploitation activities as far as practicable to facilitate enterprise reporting and provide a baseline for common interpretation.

⁶ The MASSC supports RA 1205 – Air System Safety Cases.

⁷ For instance; RA 1223 – Airworthiness Information Management, RA 1410 – Occurrence Reporting and Management, RA 2401 – Documents and Records, RA 4814 – Occurrence Reporting (MRP 145.A.60), RA 4961(3): Reliability Programme, and RA 5726 – Integrity Management; all relate in some degree to data management and exploitation.

**Regulation
1207(2)**

Air Safety Data Exploitation Procedures

1207(2) ASMS owners⁸ **shall** develop, publish and implement Air Safety data exploitation procedures that support the requirements of the Air System data exploitation strategies within their AoR.

**Acceptable
Means of
Compliance
1207(2)**

Air Safety Data Exploitation Procedures

10. ASMS owners **should**:
- Critically review relevant Air Safety data exploitation strategies to identify their requirements⁹ for data to be collected, analyzed, validated and exploited.
 - Develop data exploitation procedures that define the roles, responsibilities and activities for data management.
 - Ensure that Assurance of compliance with exploitation procedures is included within their Management System¹⁰.
 - Ensure that exploitation procedures are routinely reviewed as part of their continuous improvement process.
 - Ensure compliance with data governance requirements in JSP 441³, **JSP 453⁴** and any relevant security requirements from JSP 440¹¹.

**Guidance
Material
1207(2)**

Air Safety Data Exploitation Procedures

11. **▶▶**
12. **▶ Automated systems are expected to provide the primary method for data collection and reporting, with manual arrangements used where automation is not practicable. ◀**
13. **▶▶ Data exploitation procedures ▶▶ need to be clearly identifiable and auditable within the ASMS. For instance, appropriate requirements could be included within the ▶ Type ◀ Airworthiness strategy¹² for the Type Airworthiness Authority (TAA) and / or Type Airworthiness Manager (TAM)¹³, the Exposition¹⁴ for approved organizations, ▶ Aviation ◀ Engineering Standing Orders¹⁵ for a Military Maintenance Organization, or the Air Safety management plan¹⁶ for an ADH.**
14. Data governance requirements include the span of activities including data Quality, integrity, availability and disposal. Therefore, the procedures need to include arrangements for both internal management and Maintenance of data integrity across organization / system boundaries, as well as aspects such as legal requirements regarding data disposal. RA 1225¹⁷ relates to documentation which includes data, so its intent **▶ will ◀** be followed in terms of retaining appropriate Airworthiness data for the mandated period.

⁸ An ODH's / AM(MF)'s ASMS will include numerous interfacing and interconnected ASMSs from subordinate and supporting organizations; all ASMS owners are required to support data exploitation.

⁹ ASMS owners may also identify their own requirements for data exploitation to support local conditions.

¹⁰ The term 'Management System' is used to recognize that Safety, Quality, business and environmental etc are all valid Management Systems that may be in use.

¹¹ Refer to JSP 440 – Defence Manual of Security, Resilience and Business Continuity. Organizations external to the MOD will need to comply with current legislation and relevant contractual conditions.

¹² Refer to **▶ RA 5010 – Type Airworthiness Strategy. ◀**

¹³ Refer to RA 1162 – Air Safety Governance Arrangements for Civilian Operated (Development) and (In-Service) Air Systems. Dependant on the agreed split of Type Airworthiness (TAW) responsibilities, TAM may be read in place of TAA as appropriate throughout this RA.

¹⁴ Refer to RA 4943 – Continuing Airworthiness Management Exposition (MRP Part M Sub Part G); RA 4816 - Maintenance Organization Exposition (MRP 145.A.70); **▶ RA 1028(4) ◀**: Contractor Flying Organization Exposition; RA 5850(4): Design Organization Exposition; RA 3100(3): Air Traffic Management Equipment Organization Exposition.

¹⁵ Refer to RA 4009 – Aviation Engineering Orders and Procedures.

¹⁶ Refer to the Manual of Air Safety.

¹⁷ Refer to RA 1225 – Air Safety Documentation Audit Trail.

Annex A

Examples of Air Safety Data Categories

1. The examples of data categories listed below are not exhaustive but aim to illustrate the types of data that ADH, AM(MF), DE&S teams and other ADH-Facing support organizations, Maintenance Organizations (MO)¹⁸, Design Organizations (DO)¹⁹ and Production Organizations (PO)²⁰ ►could◄ consider exploiting as part of their ►ASMS.◄
2. The level and type of data exploitation will depend upon the perspective of the user: ODH and DE&S operating centre director staff conducting second party Assurance (2PA) may be reviewing trends across Air System types and fleets, whereas at the Delivery Duty Holder (DDH) and TAA level, staff managing activities or conducting first party Assurance (1PA) will be more focused on performance and trends within and between individual units / squadrons. The key issue is ►ensuring◄ that ASMSs are clearly focused on delivering the intent of the relevant exploitation strategy in support of ASSCs.

Table 1. Examples of Air Safety Data Categories

Category	Regulation►◄	Who
<p>Operations and Flight Safety Data. Data arising from Occurrence reports, including Defence Air Safety Occurrence Report (DASOR) or InForms and local equivalents.</p> <p>This forms a rich source of data which can be exploited to identify specific issues or trends and understand the reasons²¹, both over time and against the wider Regulated Community. A ►◄ list of potential themes includes:</p> <ul style="list-style-type: none"> • Use of local mitigations (vice recommendations); • Number of recommendations and time to implement; • Time to raise and close reports; • Dominant causal factors; • Correlation of evidence with bow tie barrier claims; <p>These all relate to the ASSC claim that the Air System is operating safely.</p>	<p>RA 1410 RA 4814 RA 5825</p>	All
<p>Safety Management System (SMS)²² Data. Data contained in Hazard²³ logs, Risk Registers and bow tie models.</p> <p>Hazard and Risk ►will◄ be regularly reviewed to ensure correct ownership and active management, and to ensure there are no broader trends developing which undermine ASSC claims.</p> <p><u>Note:</u> The RA 1200²⁴ ASMS facet of Safety performance measurement is also likely to contain metrics drawn from several of the sections in this Annex.</p>	<p>RA 1200 RA 1210 ►RA 5011◄</p>	All
<p>Aircrew training, Competence and Currency Data. Data contained in logbooks, training records, STARS, TMIS²⁵ and similar IT tools.</p> <p>Exploitation of such data would potentially allow early identification of issues or trends with crew availability that would impact delivery of capability. It would also facilitate improved management of the flying Authorization and supervision processes and ensure best utilization of resources by enabling optimization of the flying programme.</p>	<p>RA 2401 RA 2305 RA 2306</p>	ADH / AM(MF)

¹⁸ Refer to RA 4800 – General Requirements (MRP Part 145).

¹⁹ Refer to RA 5850 – Military Design Approved Organizations (MRP Part 21 Subpart J).

²⁰ Refer to RA 5835 – Military Production Organizations (MRP Part 21 Subpart G).

²¹ Identification of trends and 'outliers' is not necessarily an indication of 'bad', but merely a means to highlight the need to investigate further.

²² The term 'SMS' is used to cater for the broad range of supporting organizations, some of whom may include Total Safety rather than just having an ASMS (Refer to ►JSP 815 – Defence Safety Management System◄).

²³ 'Hazard log' is a generic term for the document that records factors which may contribute to a Risk.

²⁴ RA 1200 – Air Safety Management mandates 16 facets.

²⁵ STARS and TMIS are IT systems used to plan, authorize and manage flying / training programmes, and to record and track Aircrew competencies, currencies and qualifications.

Category	Regulation ▶◀	Who
<p>Flight Data. ▶ Flight data recording Systems continuously acquire and record a significant amount of parametric data. Once acquired, this data is highly suited to exploitation for a variety of activities.</p> <p>An example is Flight Data Monitoring, used to monitor deviations from Standard Operating Procedures in order to improve Air Safety.</p> <p>Further examples include Airworthiness activity such as Statement of Operating Intent and Usage (SOIU) Validation, integrity management programmes and efficiency projects. ◀</p>	<p>▶ RA 1208 ◀ RA 5726</p>	<p>▶ All ◀</p>
<p>Design Data and Type Airworthiness ▶◀ (TAW). Airworthiness Dynamic Data (ADD)²⁶ contained in Maintenance documentation systems²⁷, plus ageing Air System and Airworthiness review survey reports, system monitoring equipment²⁸ and Fault reports.</p> <p>Exploitation of Maintenance records and Fault reports will identify whether Systems and components are performing as intended and meeting their planned reliability targets, and hence whether Air System Modification or changes to the Maintenance schedule are required.</p> <p>Similarly, analysis of survey reports and system monitoring data will identify the need for Modification, amendment to the SOIU or Maintenance schedules, or ultimately re-lifing of the Air System.</p> <p>Close attention to the harvesting and exploitation of assured performance data through life will also facilitate a more effective justification of any required life extension programme or extension to the Out of Service Date if required.</p> <p>Exploitation of ADD against design data will support the ASSC claim of being safe to operate.</p>	<p>RA 1015 RA 1223 RA 1230 RA 4973 RA 5825 RA 5850 RA 5723 RA 5724 RA 5725 RA 5726</p>	<p>TAA DO Military Continuing Airworthiness Management Organization (Mil CAMO) Chief Air Engineer (CAE)²⁹</p>
<p>Continuing Airworthiness ▶◀ (CAw). The data sources are largely as listed above under TAW but will be exploited differently. Additional sources may include training / Competence records or local databases produced for specific purposes such as facility defect logs.</p> <p>Exploitation of ADD will enable optimization of the Aircraft Maintenance programme and will enable effective engagement with the TAA to seek action where Corrective Maintenance or ▶ Limitation / Acceptable Deferred Fault ◀³⁰ trends indicate inadequate performance.</p> <p>Similarly, working closely with TAAs, analysis of Preventive Maintenance data will enable improvements to the Maintenance schedule using reliability centred Maintenance techniques.</p> <p>Ensuring the effectiveness of CAw activities is fundamental to supporting the ASSC claim of being safe to operate because the safe Air System design is predicated on there being effective Maintenance.</p>	<p>▶ RA 5012 ◀ RA 1223 RA 4805 RA 4806 RA 4811 RA 4813 RA 4947 RA 4951 RA 4961 RA 4964</p>	<p>TAA Mil CAMO CAE</p>

²⁶ ADD is the data which changes with system operation, such as component lifing, Configuration and Maintenance activity; refer to RA 1223 – Airworthiness Information Management.

²⁷ ▶ Maintenance documentation systems ◀ include GOLDesp, LITS, ALIS / ODIN, ESS, MDS and the paper MOD Form 700 series.

²⁸ Monitoring systems include Fatigue Meters, Health and Usage Monitoring Systems and Operational Loads Monitoring.

²⁹ The CAE may be at the Senior, Operating or Delivery Duty Holder level.

³⁰ Excessive use of Limitations or Acceptable Deferred Faults may indicate an inadequate Support Policy.

Category	Regulation ▶◀	Who
<p>Quality Management and Assurance Findings. Data contained within Quality Occurrence Reports, Audit findings tracking tools and similar Assurance records.</p> <p>Effective exploitation of Assurance findings, their root Cause, and the time to close will enable identification of underlying trends such as training, resources, or issues with policy and procedures. It will also facilitate more effective planning of Risk-based Assurance.</p>	<p>RA 1005 RA 1015 ▶ RA 1028(2) RA 5011 ◀ RA 4951 RA 5835 RA 5850</p>	<p>All</p>
<p>Service Inquiry (SI) findings. SI reports are made widely available. For those directly affected, reviewing progress against extant SI recommendations provides a useful insight into the wider performance of the relevant organizations involved and can prompt follow-up as required.</p> <p>SI reports also provide a rich source of detailed analysis which invariably will have broader applicability to the wider community and be pertinent to many other operating situations. Hence, they are worth reviewing to identify any wider lessons that can be learned.</p>	<p>RA 1420</p>	<p>All</p>

