

RA 1207 - Air Safety Data Management and Exploitation

Rationale

Demonstrating that an Air System¹ is safe to operate and being operated safely, chiefly through the Air System Safety Case² (ASSC), relies upon the effective management of Air Safety¹ data as part of an Air Safety Management System³ (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 Life¹ 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.

Contents

1207(1): Air Safety Data Exploitation Strategy

1207(2): Air Safety Data Exploitation Procedures

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.
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 documentation⁴.
3. The Strategy **should** apply the requisite principles of Data Governance for managing data as defined in JSP 441⁵, 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 regulation⁶:

“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.”

ODH / AM(MF) Air Safety Data Exploitation Strategies

6. The purpose of the Air Safety Data Exploitation Strategy is to provide specific aims and objectives for Air Safety Data Exploitation. 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 appropriate subordinate supporting organizations, and

¹ Refer to MAA02 - MAA Master Glossary.

² Refer to RA 1205 - Air System Safety Cases.

³ Refer to RA 1200 - Air Safety Management.

⁴ Paragraph 13 provides some examples of possible appropriate documentation.

⁵ Refer to JSP 441 – Information, Knowledge, Digital and Data in Defence. External organizations without direct access are to follow the UK’s Data Protection Legislation and relevant contractual conditions.

⁶ Extracted from 2020 edition of JSP 441: Data management.

Guidance Material 1207(1)

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. The full range of personnel across the AoR who contribute to Air Safety are to be considered when 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)⁷ 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 assured⁸.
 - 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 dependencies⁹.

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 are to 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.

⁷ The MASSC supports RA 1205 – Air System Safety Cases.

⁸ JSP 441 contains comprehensive guidance on managing and exploiting data.

⁹ 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 owners¹⁰ **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**:
- a. Critically review relevant Air Safety Data Exploitation Strategies to identify their requirements¹¹ for data to be collected, analyzed, validated and exploited.
 - b. Develop Data Exploitation procedures that define the roles, responsibilities and activities for data management.
 - c. Ensure that assurance of compliance with Exploitation Procedures is included within their Management System¹².
 - d. Ensure that Exploitation Procedures are routinely reviewed as part of their Continuous Improvement process.
 - e. Ensure compliance with Data Governance requirements in JSP 441, and any relevant security requirements from JSP 440¹³.

**Guidance
Material
1207(2)**

Air Safety Data Exploitation Procedures

11. The required roles and responsibilities for data management and exploitation are listed in para 7.
12. Data collection and reporting may be through manual arrangements such as paper returns and manual updating of computer systems or through automated systems.
13. There is no specific requirement to record Data Exploitation procedures in a separate document, but they need to be clearly identifiable and auditable within the ASMS. For instance, appropriate requirements could be included within the Airworthiness Strategy¹⁴ for the Type Airworthiness Authority (TAA) and / or Type Airworthiness Manager (TAM)¹⁵, the Exposition¹⁶ for Approved Organizations, Air Engineering Standing Orders¹⁷ for a Military Maintenance Organization, or the Air Safety Management Plan¹⁸ 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 1225¹⁹ relates to documentation which includes data, so its intent is to be followed in terms of retaining appropriate Airworthiness data for the mandated period.

¹⁰ 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.

¹¹ ASMS owners may also identify their own requirements for data exploitation to support local conditions.

¹² 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.

¹³ 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.

¹⁴ Refer to RA 1220(1): Airworthiness Strategy.

¹⁵ 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.

¹⁶ Refer to RA 4943 – Continuing Airworthiness Management Exposition (MRP Part M Sub Part G); RA 4816 - Maintenance Organization Exposition (MRP 145.A.70); RA 2501(3): Contractor Flying Organization Exposition; RA 5850(4): Design Organization Exposition; RA 3100(3): Air Traffic Management Equipment Organization Exposition.

¹⁷ Refer to RA 4009 – Aviation Engineering Orders and Procedures.

¹⁸ Refer to the Manual of Air Safety.

¹⁹ 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)²⁰, Design Organizations (DO)²¹ and Production Organizations (PO)²² are to consider exploiting as part of their Management System.

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 to ensure 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 ²³	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 reasons²⁴, both over time and against the wider regulated community. A very brief 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)²⁵ Data. Data contained in hazard²⁶ logs, risk registers and Bow Tie models.</p> <p>Hazard and risk data are to 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 1200²⁷ 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 1220</p>	All
<p>Aircrew training, competence and currency data. Data contained in logbooks, training records, STARS, TMIS²⁸ 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)

²⁰ Refer to RA 4800 - General Requirements (MRP Part 145).

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

²² Refer to RA 5835 - Military Production Organizations (MRP Part 21 Subpart G).

²³ For full RA titles refer to Table 2.

²⁴ Identification of trends and 'outliers' is not necessarily an indication of 'bad', but merely a means to highlight the need to investigate further.

²⁵ 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 DSA 01.1 - Defence Policy for Health, Safety and Environmental Protection).

²⁶ 'Hazard log' is a generic term for the document that records factors which may contribute to a risk.

²⁷ RA 1200 – Air Safety Management mandates 16 facets.

²⁸ 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.

<p>Flight Data Monitoring. FDM is the exploitation of data that is already recorded in the 'black box' flight data recorders using specialist software that identifies occurrences of pre-programmed events.</p> <p>Implementation of FDM as part of an ASMS will deliver improved operational capability by enabling optimization of crew training and by maximizing availability of Air Systems because deviations from procedures and exceedance of limits will be identified. FDM will also enable a more accurate assessment of compliance with assumptions in the Statement of Operating Intent and Usage (SOIU) and support the ASSC claim of operating safely.</p>	RA 1205 RA 5726	ADH / AM(MF)
<p>Design Data and Type Airworthiness¹ (TAw). Airworthiness Dynamic Data (ADD)²⁹ contained in maintenance documentation systems³⁰, plus Ageing Air System and Airworthiness Review survey reports, system monitoring equipment³¹ 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-living 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>	RA 1015 RA 1223 RA 1230 RA 4973 RA 5825 RA 5850 RA 5723 RA 5724 RA 5725 RA 5726	TAA DO Military Continuing Airworthiness Management Organization (Mil CAMO) Chief Air Engineer (CAE) ³²
<p>Continuing Airworthiness¹ (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 Lim / ADF³³ 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>	RA 1220 RA 1223 RA 4805 RA 4806 RA 4811 RA 4813 RA 4947 RA 4951 RA 4961 RA 4964	TAA Mil CAMO CAE
<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>	RA 1005 RA 1015 RA 1024 RA 1220 RA 4815 RA 4951 RA 5835 RA 5850	All

²⁹ ADD is the data which changes with system operation, such as component lifing, configuration and maintenance activity; refer to RA 1223 - Airworthiness Information Management.

³⁰ Such systems include GOLDesp, LITS, ALIS / ODIN, ESS, MDS and the paper MOD Form 700 series.

³¹ Monitoring systems include Fatigue Meters, Health & Usage Monitoring Systems and Operational Loads Monitoring.

³² The CAE may be at the Senior, Operating or Delivery Duty Holder level.

³³ Excessive use of Limitations or Acceptable Deferred Faults may indicate an inadequate Support Policy.

<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>	RA 1420	All
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Table 2. RA Number and Titles as referred to within Table 1.

Regulation	RA Title
RA 1005	Contracting with Competent Organizations
RA 1015	Type Airworthiness Authority - Roles and Responsibilities
RA 1024	Accountable Manager (Military Flying)
RA 1200	Air Safety Management
RA 1210	Ownership and Management of Operating Risk (Risk to Life)
RA 1220	Delivery Team Airworthiness and Safety
RA 1223	Airworthiness Information Management
RA 1230	Design Safety Targets
RA 1410	Occurrence Reporting and Management
RA 1420	Service Inquiries; Air Accident and Significant Occurrence Investigation
RA 2305	Supervision of Flying
RA 2306	Authorization of Flights
RA 2401	Documents and Records
RA 4805	Facility Requirements (MRP 145.A.25)
RA 4806	Personnel Requirements (MRP 145.A.30)
RA 4811	Maintenance Planning (MRP 145.A.47)
RA 4813	Maintenance Records (MRP 145.A.55)
RA 4814	Occurrence Reporting (MRP 145.A.60)
RA 4815	Maintenance Procedures and Safety and Quality Policy (MRP 145.A.65)
RA 4947	Continuing Airworthiness Management - MRP Part M Sub Part G
RA 4951	Quality System - MRP Part M Sub Part G
RA 4961	Aircraft Maintenance Programme and Military Continuing Airworthiness Management Organization Responsibilities for Air System Release - MRP Part M Sub Part C
RA 4964	Continuing Airworthiness Management Records - MRP Part M Sub Part C
RA 4973	Military Airworthiness Review Process - MRP Part M Sub Part I
RA 5723	Ageing Air System Audit
RA 5724	Life Extension Programme
RA 5725	Out of Service Date Extension Programme
RA 5726	Integrity Management
RA 5825	Fault Reporting and Investigation
RA 5835	Military Production Organization (MRP Part 21 Subpart G)
RA 5850	Military Design Approved Organization (MRP part 21 Subpart J)