RA 1220 - Delivery Team Airworthiness and Safety

Rationale

An Airworthiness Strategy is required for each Air System in order to set down the intended approach to the demonstration and sustainment of Airworthiness through life. Not having the Airworthiness Strategy in place may result in key stakeholders not being sufficiently aware of the Airworthiness management details for each Air System, resulting in the lack of evidence necessary to support Airworthiness decision making. This Regulatory Article (RA) sets out the requirements and processes necessary to support the Airworthiness Strategy.

Contents

1220(1): Airworthiness Strategy
1220(2): Project Safety Management
1220(3): Equipment Safety Assessment
1220(4): Independent Evaluation and Audit
1220(5): Support Policy Statement

Regulation 1220(1)

Airworthiness Strategy

1220(1) The Type Airworthiness Authority (TAA) shall produce an Airworthiness Strategy for an Air System consistent with the Project Through Life Management Plan (TLMP).

Acceptable Means of Compliance 1220(1)

Airworthiness Strategy

1. The TAA should:

a. Formulate an Airworthiness Strategy that defines the scope of the project, including the intended military use of the Air System, and details the approach to Airworthiness management.

b. Ensure that as a minimum, the Airworthiness Strategy contains the attributes detailed within the sections of the exemplar Airworthiness Strategy¹.

c. Ensure that the Airworthiness Strategy includes explanation of the four Airworthiness pillars, which comprise:

(1) Air Safety Management System (ASMS). The approach to establishing an effective ASMS² should be detailed, and cover, specifically, the relationship (contractual or otherwise) with, and requirements placed upon, stakeholder organizations such as the Front Line Command (FLC) Capability Organization Senior Responsible Owner (SRO), current or future Operating Duty Holder (ODH) or Accountable Manager (Military Flying) (AM(MF)), the Design and Production Organizations, the appropriate Test & Evaluation (T&E) organization³, the Military Continuing Airworthiness Manager (Mil CAM), and other relevant contractors and other defence equipment organizations (eg Commodity Delivery Teams (DT)).

(2) Recognized Standards. The use of recognized standards to ensure Airworthiness, including the approach to complying with Military Type Certification⁴, should be detailed, in conjunction with the ODH who has responsibility for Continuing Airworthiness of the Air System or AM(MF) who will need to be assured of the Continuing Airworthiness of the Air System.

¹ An example can be found under Related Information on the Regulations page of the MAA website: www.gov.uk/maa.
² Refer to RA 1200 – Defence Air Safety Management.
³ Refer to RA 2370 – Test and Evaluation.
⁴ Refer to RA 5810 – Military Type Certificate (MRP 21 Subpart B).
Acceptable Means of Compliance 1220(1)

(3) Competence. The arrangements for ensuring the use of Airworthiness competent persons⁵ and competent organizations⁶ should be detailed, including the process for managing the issue of Letters of Airworthiness Authority (LoAA)⁷ and Level K and Level J authorizations to contractors⁸.

(4) Independence. The arrangements for ensuring independent (see RA 1220(4)) assessment by the DT, independent technical evaluation, and independent safety audit should be detailed.

d. Ensure the Airworthiness Strategy also references the means by which assurance and review of the airworthiness management activities are undertaken (including confirmation that the DT has sufficient human and capital resource to conduct the task). This is likely to include, but is not restricted to, MAA and Independent Safety Auditor (ISA) Audit, and Quality Management Systems that are active and in place.

2. As a minimum, the Airworthiness Strategy should be approved by the Defence Equipment & Support (DE&S) Operating Centre Director (OCD)⁹ before Initial Gate (IG), and again before Main Gate (MG).

Guidance Material 1220(1)

Airworthiness Strategy

3. The Airworthiness Strategy facilitates the following management elements:
   a. Identification and development of project-specific Airworthiness and safety-related standards, guidelines, procedures and training.
   b. Ensuring that resource provision is sufficient to produce an airworthy design and to carry out necessary Safety Management activities.
   c. Provision of feedback on the effectiveness of the ASMS by means of internal and external audits and closure of corrective actions.

4. Where safety justifications from other Certification bodies are to be used, refer to Annex A of RA 5810⁴.

5. If relying on civil or foreign flight manuals or other approved data, the Airworthiness Strategy must provide evidence and argument that the flight profile, operating environment and the Type and Continuing Airworthiness programmes are relevant, and that arrangements will be put in place to manage any significant differences in terms of design standard and usage where they exist.

Users of the Airworthiness Strategy

6. The TAAs will generate their Airworthiness Strategy to guide their planning of the acquisition of and support to the Air Systems under their responsibility. The TAAs will use the Strategy to lay out how they will satisfy their principal responsibilities.

7. DE&S OCDs will use the document to approve the TAA’s approach to delivering airworthy Air Systems.

8. It is recommended that the MAA (DSA-MAA-OpAssure-Eng-DepHd) is able to review the Airworthiness Strategy prior to IG and MG approvals, as the MAA will use the document to derive confidence that Airworthiness will be ensured in accordance with (iaw) the regulations.

9. The ODHs or AM(MF)s will use the document as part of their overarching Air System ASMS, complementing it with their management of operators, maintainers (via the Mil CAM), infrastructure and airspace management.

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⁵ Refer to RA 1002 – Airworthiness Competent Persons.
⁶ Refer to RA 1005 – Contracting with Competent Organizations.
⁷ Refer to RA 1003 – Delegation of Airworthiness Authority and Notification of Air Safety Responsibility.
⁸ Refer to RA 1006 – Delegation of Engineering Authorizations.
⁹ Refer to RA 1013 – Air Systems Operating Centre Director - Provision of Airworthy and Safe Systems.
The Airworthiness Strategy through the CADMID/T\(^10\) Cycle

10. The Airworthiness Strategy is particularly important in the early stages of the CADMID/T cycle. The first issue of the Airworthiness Strategy is to be available before IG. Thereafter it will evolve with the project, remaining relevant through to disposal.

11. At IG the Airworthiness Strategy is expected to indicate basic details of the policies that the TAA intends to adopt for each Airworthiness pillar.

12. At MG, the Airworthiness Strategy is expected to refine the policies, and indicate the processes, procedures, people and products that the TAA intends to adopt for each Airworthiness pillar.

13. It is expected that after MG, TAAs will be targeting their effort towards the development of the Airworthiness Strategy, detailing their Airworthiness solutions rather than further developing intent. Nevertheless, the Airworthiness Strategy must be kept up-to-date for future use throughout the life of the Air System as it provides the high level context. Most notably, it is likely to need to be refreshed (and approved) in any of the following circumstances:
   a. Changes in approach to the delivery of Airworthiness (perhaps because the assumptions that were made in the original Airworthiness Strategy proved to be incorrect).
   b. Changes in commercial arrangements.
   c. Major modification to the Air System.
   d. Changes in the Air System operating environment and/or usage.
   e. Planning the delivery of Airworthiness in a new stage of the CADMID/T cycle.
   f. Significant changes in legislation, regulation or policy.

14. Note that where an Airworthiness Strategy is first drafted beyond the concept phase through the CADMID/T cycle (as might be the case for some legacy Air Systems), various documents (including the ASMS associated plan) will typically already be in place. Nonetheless, the documentation of the underlying policies and principles applicable to the Air System in a succinct Airworthiness Strategy remains an essential and valuable exercise.

Addressing Standards in Airworthiness Strategies

15. The Airworthiness Strategy must address all Airworthiness-related standards that the TAA expects to employ to ensure delivery of an airworthy solution and demonstrate compliance with the MAA Regulatory Publications (MRP). At the core of the Airworthiness standards set is the MRP, and the TAA must outline their approach to compliance for all relevant aspects of the MRP and detail the top-level processes and standards (eg Defence Standard (Def Stan) 00-056 and Def Stan 00-970) which will guide the project.

Acceptance of an Airworthiness Strategy

16. The Airworthiness Strategy must be formally approved by the 2* OCD. Prior to submission to the OCD for approval, it is recommended that the Airworthiness Strategy is forwarded to the MAA, SRO, receiving ODH, current ODH or AM(MF), the relevant Release To Service Authority (RTSA), DE&S Airworthiness Team and the respective OCD Safety Team for review and comment. The OCD’s approval of the Airworthiness Strategy represents his endorsement that Airworthiness aspects of the programme are viable.

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\(^{10}\) The Concept, Assessment, Demonstration, Manufacture, In-Service and Disposal (CADMID) Cycle. In some cases, Termination of service is more appropriate than Disposal.
Regulatory Article 1220

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Project Safety Management

1220(2) The TAA or Commodity Delivery Team Leader (DTL) shall be responsible for the Safety Management of the Project.

Project Safety Management

Project Safety Management Plan

17. The TAA or Commodity DTL should:
   a. Generate and manage the Project Safety Management Plan (Project SMP) in consultation with the relevant other TAA or Commodity DTLs and the SRO or the ODH depending on the phase of the project.
   b. Ensure that the Design Organization (DO) produces and maintains a Project SMP covering their activities, and that this is integrated and co-ordinated with the Project SMP.
   c. As part of the Project SMP ensure that a Hazard Log is generated and maintained, containing the minimum attributes listed in Annex A.

18. For an Air System Project SMP, the TAA should review the list of Structural Integrity (SI), Systems Integrity (SysI) and Propulsion Integrity (PI) assurance measures, at least twice yearly and incorporate safety milestone measures into the Project TLMP.

Project Safety Panel

19. The TAA or Commodity DTL should establish and chair the Project Safety Panel (PSP) to support the SRO, ODH or AM(MF), depending on the phase of the project.

20. When risks are identified that could lead to a Risk to Life, the TAA or Commodity DTL should communicate this to the relevant other TAA or Commodity DTLs, SRO, ODH or AM(MF). In addition, the PSP should ensure satisfactory communication exists between the DT and stakeholders to address any Air Safety and Airworthiness issues.

21. The PSP should review the Equipment Safety Assessment(s) and supporting products (including Hazard Log(s)), co-ordinate the Project SMP and provide advice to the appropriate SRO, ODH, AM(MF) and their staff.

Project Safety Committee

22. The TAA or Commodity DTL should ensure that a Project Safety Committee (PSC) is established.

23. The PSC should give detailed considerations to the hazards identified by the DO’s safety analysis and the tolerability of the safety risks, and make recommendations on the acceptability of the Equipment Safety Assessment that are considered by the PSP.

Guidance Material

Project Safety Management

Project Safety Panel

24. SRO, ODH or AM(MF) involvement with the PSP will vary dependant on project phase; for each phase the relative role of the DTL, TAA, SRO, ODH or AM(MF) is to be described in the Project SMP, and when appropriate, in an Internal Business Agreement.

25. The PSP is to include representatives from the following areas:

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11 The Commodity DTL might have responsibility for a number of items of equipment, each of which would require its own Project SMP.
12 Noting that for Equipment as opposed to an Air System there could be several ODHs.
13 Refer to RA 5720 – Structural Integrity Management.
14 Refer to RA 5721 – System Integrity Management.
15 Refer to RA 5722 – Propulsion Integrity Management.
Guidance Material 1220(2)

a. DT (technical, contracts and finance officers as required).

b. Other relevant TAAs or Commodity DTLs.

c. FLC Capability Organization.

d. RTSA.

e. Aviation Duty Holders (ADH) and Commanders.

f. DO.

g. The appropriate T&E organization.

h. ▶ Defence Aircrew Publications ◀ Squadron.

i. ISA.

j. DE&S Operating Centre Safety Team.

k. Specialist advisers where appropriate.

26. To support the PSP the TAA or Commodity DTL may establish one or more Working Groups (WGs) (proportionate to the scale of the Project) to assess hazards or review the integrity of specific systems.

Project Safety Committee

27. If the PSC is for a project that contains many systems (e.g. upgrading an Air System mark (e.g. Mk1 upgrade to Mk2)), then the TAA must chair the meeting, with DO participation, law Def Stan 00-056, (specifically the DO Project Safety Engineer) as the DO may not be the Subject Matter Expert (SME) for all systems within the project.

28. If the PSC is for a project that contains only one system (e.g. upgrade of rotor blades/engines/TCAS), then the TAA is to ensure that the DO (specifically the DO Project Safety Engineer) is contracted to Chair the meeting, as they will be the system’s SME.

Equipment Safety Assessment

1220(3) The TAA or Commodity DTL shall initiate and maintain an up-to-date Equipment Safety Assessment.

Acceptable Means of Compliance 1220(3)

Equipment Safety Assessment

29. The Equipment Safety Assessment\(^{16}\) for an Air System should clearly set down the evidence and arguments used to justify the safety of the Air System so that agreement can be reached on the validity of the conclusions to underpin the Release To Service (RTS) and to be a key component of the ODH’s overall Air System Safety Case (ASSC)\(^{17}\). The relationship of the ASSC to the Equipment (and other Defence Lines of Development (DLoD)) Safety Assessments is illustrated in Figure 1.

\(^{16}\) An Equipment Safety Assessment may be written to cover several minor variations to the as-flown configuration by means of compatibility matrices.

\(^{17}\) Refer to RA 1205 – Air System Safety Cases.
30. The Safety Assessment for an item of equipment should clearly set down the evidence and arguments used to justify the safety of the item such that it can be used to support the host Air System’s Equipment Safety Assessment and the ODH’s ASSC.

31. The Equipment Safety Assessment should be maintained and routinely kept up-to-date throughout the life of the Air System or Equipment.

32. The Equipment Safety Assessment should:
   a. Define the configuration and operating environment (referencing the Statement of Operating Intent and Usage) for an Air System where appropriate to which it applies.
   b. Describe the safety requirements, targets and attributes.
   c. Describe the design.
   d. Provide a justification for the Airworthiness of the design; this means addressing both new equipment and systems, and the effect of changes to existing equipment and systems.
   e. Detail the evidence for Airworthiness, including, as appropriate, the results of analysis, tests and trials carried out by the DO and independent technical evaluation organizations, safety questionnaires for Service Modifications, etc.
   f. Identify the limitations and procedures necessary to achieve the required level of safety for the subject configuration.
   g. Note that safe operation of the design is dependent upon an effective Support Policy Statement (SPS) iaw RA 1220(5).

33. The Equipment Safety Assessment should be summarized periodically in an Equipment Safety Assessment Report. The Equipment Safety Assessment Report should be produced to support approval of the project business case at IG and MG, and for Air Systems, as a key component of the ASSC at RTS. Equipment Safety Assessment Reports should follow the structure identified in Def Stan 00-056.
34. Where a change to an Air System is not covered by the existing Equipment Safety Assessment, the Assessment should be revised. An updated Equipment Safety Assessment Report should be produced for an Air System as follows:
   a. For Major Changes\textsuperscript{18} or changes with a large safety impact, as a complete new issue of the Equipment Safety Assessment Report.
   b. For Minor Changes\textsuperscript{20} with little safety impact, as an Annex to the previous Report, providing a Safety Statement.
   c. At least every 4 years for an in-service Air System, once a platform is in Service.
   d. Additionally, as determined by the TAA.

**Safety Analysis**

35. The TAA or Commodity DTL should ensure that an Equipment Safety Assessment is supported by safety analysis iaw Def Stan 00-056. The safety analysis should be carried out by the equipment DO, or by specialist agencies contracted by the DT. The safety analysis should be carried out on new Air Systems, equipment, and on subsequent changes.

**Commercial Off The Shelf (COTS) Systems and Software**

36. The TAA or Commodity DTL for projects involving the use of COTS systems or software should ensure that the Equipment Safety Assessment contains an adequate safety justification for the COTS components.

**Demonstration of Airworthiness**

37. For all military-type Air Systems the TAA should commission a Safety Assessment from the DO, to satisfactorily demonstrate the Airworthiness of the design.

38. For civil derivative Air Systems a suitable argument to demonstrate Airworthiness should be constructed by the TAA.

39. The DO’s Safety Assessment should be based on Def Stan 00-056, or for higher integrity software, Def Stan 00-970 Part 13.

**Equipment Safety Assessment**

**Safety Analysis**

40. The TAA or Commodity DTL is to ensure that, where applicable, the Equipment Safety Assessment:
   a. Addresses any differences in the operating environment and usage from those in the certification basis of the competent certifying body.
   b. Addresses the risks and mitigations of not complying with UK legislation and standards.

41. The TAA or Commodity DTL may consider seeking advice from:
   a. The DO.
   b. Other relevant TAAs or Commodity PTLs.
   c. The SRO.
   d. The RTSA.
   e. Relevant ADHs and Commanders.
   f. Appropriate specialists (Defence Ordnance Safety Group and Defence Electromagnetic Environmental Effects Authority) where weapons safety, electromagnetic compatibility or radiation hazard may be involved.
   g. The appropriate T&E organization.

\textsuperscript{18} Refer to RA 5820 – Changes in Type Design (MRP 21 Subpart D).
h. MAA Certification Division staff where Structural, Propulsion or Systems Integrity is involved.

i. Specialist agencies.

COTS Systems and Software

42. Generally, COTS components will not be originally designed for use in military Air Systems. One difficulty is that it may not be possible to perform detailed testing or analysis based on knowledge of the design. This limitation implies that many of the current approaches to Airworthiness evaluation are not applicable. Furthermore, it may be difficult to make safety decisions based on the quality of the development process because there is insufficient information. Therefore, evaluation of the safety of a COTS component has generally to be undertaken by analysing its performance. Two possible means are:

a. Functional Test Data. Functional tests can be used to derive test data related to the specification; the tests usually aim to exercise all the functions of the component.

b. Use of Field Data. Data may be available on the safety performance of the component in other, similar applications. However, commercial pressures to produce frequent upgrades of COTS components may mean that data is limited and that priority is given by the manufacturer to providing new features rather than improving reliability.

43. Further guidance on the Equipment Safety Assessment of COTS systems is contained in Def Stan 00-056. Guidance on the assessment of Software of Unknown Pedigree is available on the Acquisition System Guidance. Ultimately, Def Stan 00-970 Part 13 refers to acceptable standards for software.

Demonstration of Airworthiness

44. The demonstration of Airworthiness may include design analysis, application of specified standards (such as Def Stan 00-970) and procedures, historical evidence of successful use of particular design features, system tests, and ground and air tests to arrive at an overall assessment of Airworthiness. The demonstration will be as specified in the Air System or modification contract including the operating conditions to be applied, and may be undertaken during the development phase for the Air System or modification.

Concept Phase

45. The SRO and the TAA or Commodity DTL will ensure that the safety requirements are identified (from the Equipment Safety Assessment) and recorded in the developing ASSC. The ASSC will be in outline form, with the risk analysis being carried out for each business option on a functional basis. By the end of the Concept phase, the TAA or Commodity DTL will have developed the project safety strategy in sufficient detail to demonstrate that:

a. The safety risks are understood.

b. The ASSC can be properly managed throughout the remainder of the acquisition phases.

c. Key milestones and acceptable high-level safety targets have been identified.

Assessment Phase

46. A preliminary Equipment Safety Assessment of each of the competing technical solutions, identifying the hazards and risks through life and the strategies for their control, will be undertaken.

Demonstration, Manufacture and In-Service Phases

47. During the Demonstration phase, the Equipment Safety Assessment and Equipment Safety Assessment Reports will be progressively developed to fulfil two complementary but distinct purposes:

a. The safety of the planned Demonstration phase tests and trials is to be assessed and documented to justify embarking on the trials programme. In particular, prior to commencement of flying or significant trials phases, the safety of flight trials is to be addressed by Equipment Safety Assessment Reports issued in support of the Certificate of Design\textsuperscript{20} and Military Permit to Fly\textsuperscript{21}.

b. Support the design of series production equipment.

**Decommissioning and Disposal/Termination**

48. The Equipment Safety Assessment will need to address decommissioning and disposal of the Air System, sub-system or Equipment (further guidance is contained in the Defence Logistics Framework), or termination of service. The following are to be covered:

a. Disposal of hazardous materials.

b. Safe recovery and disposal, or neutralization of the hazard if recovery is impractical, following an incident or accident.

c. Scope of the Safety Assessment and supporting justifications when the Air System, sub-system or Equipment is disposed of to a third party or terminated from service.

**Independent Evaluation and Audit**

1220(4) The TAA or Commodity DTL shall ensure the Equipment Safety Assessment and Project Safety Management System (Project SMS) is subject to independent evaluation and audit.

**Independent Evaluation and Audit**

49. The Equipment Safety Assessment and Project SMS should be subjected to independent evaluation and audit consisting of:

a. Independent analysis of the data evidence supporting the Equipment Safety Assessment, including, where appropriate, a qualitative assessment of Air System handling, Human Machine Interface (HMI) and crew workload undertaken by an ITE.

b. An independent process audit against the Project SMP, covering such activities as (but not limited to) the PSP, RTS WG, DT processes, DO’s ASMP, carried out by an ISA iaw Def Stan 00-056.

50. The decision whether to undertake a qualitative assessment of Air System handling, HMI and crew workload should be made by the SRO or receiving ODH.

51. Both the ITE and ISA should be competent and suitably qualified individuals or teams, independent of the outcome or processes they are reviewing.

52. The ITE should be recognised as a SME in the field which is being reviewed.

**Independent Evaluation and Audit**

53. Care is to be taken to ensure there is no possibility of an organization auditing its own Equipment Safety Assessment or Project SMS.

54. Varying ITEs may be employed to provide evaluation of different aspects of an Equipment Safety Assessment.

55. Where a contractor is employed as ITE, it is to be exclusively by the DT to act on its behalf and not via the Prime Contractor and/or DO; noting that if the MOD has the required competence, and based on the level of acceptable risk, then this technical evaluation (must be an independent evaluation) could be provided from within the DT.

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\textsuperscript{20} Refer to RA 5103 – Certificate of Design.

\textsuperscript{21} Refer to RA 5880 – Military Permit to Fly (MRP 21 Subpart P).
56. Def Stan 00-056 states that the appointment of an ISA is to be at the sole discretion of the MOD. Early appointment will allow the ISA to assess early versions of the Project SMP, assist with tendering and provide safety advice throughout the project’s life. The ISA could also provide generic safety advice about the Project SMS to the DT, the DO and other stakeholders.

57. It is acceptable for the ISA and ITE to be involved in the joint working environment between the DT and DO; for example in a Hazard Log WG or in a Combined Test Team approach. Duplication of effort will be avoided if the ISA and ITE work collaboratively with the MOD and DO so that their assessments can be incorporated in the overall project schedule. It is important that the ISA and ITE work is conducted on behalf of the TAA or Commodity DTL and any advice they may have about the design and/or safety is to be directed to them.

Support Policy Statement

1220(5) The TAA or Commodity DTL\(^{22}\) **shall** ensure that a SPS is produced, promulgated and maintained for their Air System or Equipment.

Support Policy Statement

58. The SPS should:
   a. Define the on-aircraft and equipment maintenance philosophies (both preventive and corrective), and the methodology used to develop the relevant maintenance schedule.
   b. Detail the Approved Data that will enable delivery of the Support Policy, including the planned method for promulgating amendments.
   c. Identify the equipment and systems which are included within the Equipment Safety Assessment but which are managed and supplied by other DTs, referencing the appropriate individual SPS and the relevant providers.
   d. Identify the data to be gathered through life and how it is intended to support the requirements for data exploitation and fault trend analysis.
   e. Be promulgated as the first leaflet in the Topic 2(N/A/R)1 or equivalent, with specific support policy requirements identified in subsequent leaflets.

59. The TAA or Commodity DTL should ensure that a routine review of the SPS for continued accuracy is included within the Quality Management System. The SPS should be issued at initial RTS and reissued following any material change, or at least every 5 years.

60. The SPS should contain the minimum requirements listed in Annex B.

Support Policy Statement

61. The SPS describes the engineering and supporting administrative actions that are necessary to enable the safe and efficient operation of the Air System or Equipment and it forms an essential element of the ASSC, and Air System Document Set that underpins the RTS. A comprehensive SPS is also a key component of the Establish-Sustain-Validate-Recover-Exploit approach to Integrity Management (refer to RA 5720 series\(^{23}\)).

62. Reviews of the SPS will be carried out in consultation with appropriate Mil CAM and other support organizations, and are to include exploitation of relevant data sources (refer to RA 1140\(^{24}\)).

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\(^{22}\) A Commodity DT is required to produce, promulgate and maintain equipment SPS’s for “major sub-systems” that require a specific reference in the Air System SPS (ie: sub-systems provided by other DE&S DTs which require their own Topic 2(N/A/R)1 such as Engines, APU, Radar). Where there is no such reference, the Air System SPS is expected to cover the sub-system and there would be no requirement for a separate SPS at sub-system level.

\(^{23}\) Refer to RA 5720 - 5725 series – Integrity Management.

\(^{24}\) Refer to RA 1140 – Military Air System Technical Data Exploitation.
63. The Approved Data will encompass Instructions for Sustaining Type Airworthiness\textsuperscript{25} provided by the appropriate DO. Approved Data may also include information (such as equipment bay servicing schedules) provided by Competent Organizations or from other DTs, which is ultimately approved for use by the TAA.

64. For off-board systems that contribute to Air System operation (such as Mission Planning tools and Logistic Information Systems (LIS)), it is acceptable for support aspects to be addressed in their individual Safety Assessments rather than requiring a separate SPS. Each Safety Assessment will be referenced by the ASSC.

65. The individual Equipment SPS referenced from the Air System SPS will include systems within the Air System Type Design (such as Avionics and Commodities), Air Launched Weapons and Role Equipment.

66. The TAA or Commodity DTL is to ensure appropriate arrangements are in place with other DTs responsible for delivering the required support according to the related SPS.

67. The maintenance philosophy must address aspects such as the rationale for grouping of servicing operations, the anticipated location for their conduct (eg Forward or Depth), and relevant latitudes or periodicities.

\textsuperscript{25} Refer to RA 5810 – Military Type Certificate (MRP 21 Subpart B).
## ANNEX A
### HAZARD LOG MINIMUM REQUIREMENTS

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause(s)</td>
<td>A cause is a factor which leads directly to an occurrence (MAA02).</td>
</tr>
<tr>
<td>Date Created</td>
<td>Date the hazard is initially registered.</td>
</tr>
<tr>
<td>Hazard Title</td>
<td>Hazard Title, will be identified by a unique identifier.</td>
</tr>
<tr>
<td>Hazard Description</td>
<td>Detailed description of the hazard.</td>
</tr>
<tr>
<td>Hazard Log Description</td>
<td>Description of the system/equipment, the hazard log purpose and details its boundaries.</td>
</tr>
<tr>
<td>Pre-Mitigation Risk</td>
<td>Describes the risk severity and probability with reference to the Hazard Risk Index, before controls and mitigation applied.</td>
</tr>
<tr>
<td>Hazard Manager</td>
<td>Identifies the person responsible for the day-to-day management of a hazard, its progression, documenting controls, mitigations leading to ALARP justification in preparation for acceptance by the owner. In addition the hazard manager is responsible for preparing the periodic review documentation.</td>
</tr>
<tr>
<td>Controls</td>
<td>Field indicating the controls (sometimes referred to as mitigation) required to manage a cause/hazard/accident and if they are planned or implemented when related to an individual hazard; will have a unique identifier.</td>
</tr>
<tr>
<td>Probability</td>
<td>The frequency/likelihood of a hazard developing into an accident.</td>
</tr>
<tr>
<td>Severity</td>
<td>The potential consequence of a hazard.</td>
</tr>
<tr>
<td>Hazard Risk Matrix (HRM)</td>
<td>A HRM, used in Defence Aviation (DA), enables classification according to each Single Risk’s assessed severity and likelihood. It is designed to enable hazards to be assessed on a like-for-like basis and to assist with the determination of appropriate levels of ADH risk ownership. (MAA02).</td>
</tr>
<tr>
<td>Post-Mitigation Risk</td>
<td>Describes the current risk severity and probability with reference to the Hazard Risk Index, after controls and mitigation applied.</td>
</tr>
<tr>
<td>Hazard Status</td>
<td>Current status of hazard ie draft, open, closed, managed, approved and date the status changed.</td>
</tr>
<tr>
<td>Accident</td>
<td>With respect to Aviation Risk Management, an Accident is the realization of a Hazard becoming a harmful outcome (MAA02).</td>
</tr>
<tr>
<td>ALARP Justification</td>
<td>The evidence and controls required for the owner to declare the hazard ALARP. The residual risk is to be described in all cases for easy identification by the owner. The evidence will be cross referenced, linked to or embedded in the database.</td>
</tr>
<tr>
<td>Risk Evaluation</td>
<td>Analysis of a hazard detailing probability and severity of a hazard maturing to an accident. This to be expressed as two values pre and post mitigation.</td>
</tr>
<tr>
<td>Risk Owner</td>
<td>The ‘Risk Owner’ is the person lowest in the aviation chain (SDH, ODH or Delivery DH (DDH)) with the authority for the activity and resource to effect control. Normally the DDH or ODH.</td>
</tr>
<tr>
<td>Links</td>
<td>Links from cause to hazard to accident, linking in control measures.</td>
</tr>
<tr>
<td>Review Date</td>
<td>The date the hazard was last reviewed and when next due.</td>
</tr>
</tbody>
</table>

Database Administrator – It is recommended the database administrator and his deputy are the only people to have ‘Write’ access.
## ANNEX B

### AIR SYSTEM OR EQUIPMENT SUPPORT POLICY STATEMENT MINIMUM REQUIREMENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
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</thead>
</table>
| **Introduction**                 | The Introduction provides a brief description of the Air System/Equipment, its operational role, location of operating base(s) and the quantity of Air System/Equipment to be supported.  
The Introduction **should** also highlight any unusual features that are likely to influence support arrangements. |
<p>| <strong>Aim</strong>                          | Detail the aim of the SPS in such a way to define the support arrangements necessary to maintain the aircraft type in the Defence Air Environment.                                                                    |
| <strong>Management Responsibilities</strong>  | Detail the authorities and/or organizations with management responsibilities. These must include the following:                                                                                              |
|                                  | • DO.                                                                                                           |
|                                  | • DT or TAA.                                                                                                     |
|                                  | • RTSA; Operating Authority.                                                                                      |
|                                  | • FLC.                                                                                                          |
|                                  | • Unit (Forward and Depth).                                                                                       |
| <strong>Security Aspects</strong>             | Detail the security classification of the Air System/Equipment.                                                                                                                                            |
| <strong>Engineering Maintenance Philosophy</strong> | Describe the preventive and corrective maintenance philosophies (in Forward and Depth) applicable to the Air System/Equipment. This would include, but is not limited to:                                      |
|                                  | • On-aircraft preventive maintenance philosophy, covering:                                                         |
|                                  |   o Flight Servicing.                                                                                             |
|                                  |   o Scheduled Maintenance.                                                                                        |
|                                  |   o Condition-based maintenance.                                                                                  |
|                                  |   o Contingency-based maintenance.                                                                                |
|                                  |   o Ground Instructional Aircraft.                                                                                |
|                                  |   o Anti-deterioration maintenance.                                                                               |
|                                  |   o De-contamination instructions and maintenance.                                                               |
|                                  |   o Flight Testing.                                                                                               |
|                                  |   o Aircraft Displaying Abnormal Flying Characteristics.                                                          |
|                                  |   o Health Monitoring System.                                                                                     |
|                                  |   o Aircraft Weighing.                                                                                            |
|                                  |   o Equipment acceptance.                                                                                        |
|                                  |   o Maintenance of equipment in storage.                                                                         |
|                                  |   o Calibration.                                                                                                |
|                                  |   o Flight Simulation and Synthetic Trainers (FsAST)-installed equipment.                                         |
|                                  | • On-aircraft corrective maintenance, covering:                                                                  |
|                                  |   o Identification of maintenance philosophy.                                                                   |
|                                  |   o Allocation of on-aircraft corrective maintenance.                                                            |
|                                  |   o Expedient repairs.                                                                                           |
|                                  | • Continuous charge, in particular:                                                                             |
|                                  |   o Specify the roles covered by the authorization.                                                              |
|                                  |   o State any limitations, eg flying hours, number of landings.                                                 |
|                                  |   o Detail specific checks to be undertaken by aircrew.                                                          |
|                                  | • Equipment controlled by other DTs – authorized equipment to be maintained in-phase with the Air System maintenance cycle is to be detailed in the Topic 2(N/A/R)1. |
|                                  | • Component maintenance – detail the arrangements for off-aircraft preventive and corrective maintenance of components.                                   |
|                                  | • Surface finish – detail the surface finish philosophy.                                                         |
|                                  | • Embarked aviation – due to the additional risks associated with operations in the maritime environment, where necessary risk assessments must be completed to suit the environmental conditions. Specific engineering procedures and appropriate washing routines are to be detailed in the Topic 2(N/A/R)1. |</p>
<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Integrity Management</td>
<td>Identify the major factors affecting Integrity Management and the procedures to be used for fatigue management.</td>
</tr>
<tr>
<td>• Software support</td>
<td>Describe the arrangements for software support.</td>
</tr>
<tr>
<td>• Quality assurance</td>
<td>Detail the appropriate Quality Management System.</td>
</tr>
<tr>
<td>• Safety and environment</td>
<td>Detail how the safety of the Air System/Equipment in its operating environment must be managed. In particular identify the safety hazards to the equipment, in-use and during maintenance. A non-exhaustive list of topics to be considered is:</td>
</tr>
<tr>
<td></td>
<td>- Environmental: thunderstorm warnings, refuelling operations.</td>
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<td></td>
<td>- Contamination of the Air System/Equipment by body fluids.</td>
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<td></td>
<td>- Chemical Biological Radiological Nuclear procedures.</td>
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<td>- Radio frequency.</td>
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<td>- High voltages.</td>
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<td>- Hazardous materials.</td>
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<td>- Laser emissions.</td>
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<td></td>
<td>- Maintenance precautions, in particular handling Electro-Sensitive Semiconductor Devices.</td>
</tr>
<tr>
<td>Armed Air System</td>
<td>Where appropriate, define the procedures in the aircraft Topic 2(N/A/R)1 and appropriate Topic 5 for the following processes:</td>
</tr>
<tr>
<td></td>
<td>1. Maintenance on armed Air Systems.</td>
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<tr>
<td></td>
<td>2. Maintenance on Air System armament systems.</td>
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<tr>
<td></td>
<td>3. Armed Air System safety precautions.</td>
</tr>
<tr>
<td>Independent Inspections</td>
<td>Detail a list of those systems that are subject to Independent Inspection in the appropriate system chapters of the aircraft Topic 1, and where appropriate in any of the following publications:</td>
</tr>
<tr>
<td></td>
<td>1. Aircraft Topic 5A2 – Warnings, Cautions and Maintenance Notes (Army).</td>
</tr>
<tr>
<td></td>
<td>2. Aircraft Topic 5A2, Chapter 4 – Cautions (RAF).</td>
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<tr>
<td></td>
<td>3. Aircraft Topic 5A2, Chapter 5 – Systems Requiring Independent Checks.</td>
</tr>
<tr>
<td></td>
<td>4. Aircraft Topic 2(N/A/R)1 – General Orders and Special Instructions.</td>
</tr>
<tr>
<td>Personnel and Training</td>
<td>Specify the trades and levels of skill/experience to be employed, ensuring that the levels set are the minimum required for the task.</td>
</tr>
<tr>
<td>Test and Support Equipment</td>
<td>Identify any of the following as required:</td>
</tr>
<tr>
<td></td>
<td>1. General Purpose Test and Measurement Equipment.</td>
</tr>
<tr>
<td></td>
<td>2. Special-to-Type Test Equipment.</td>
</tr>
<tr>
<td></td>
<td>4. Special-to-Type GSE.</td>
</tr>
<tr>
<td></td>
<td>5. Special-to-Type hand tools.</td>
</tr>
<tr>
<td>Technical Information (TI)</td>
<td>Air Publications – identify the authorized for the Air System/Equipment and the standard to which they are written.</td>
</tr>
<tr>
<td></td>
<td>Maintenance Schedules – identify the authorized maintenance schedules for the Air System/Equipment.</td>
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<td></td>
<td>Engineering Maintenance Documentation – detail the maintenance documentation applicable to the Air System/Equipment.</td>
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<td></td>
<td>Fault Report Procedures – detail the fault reporting and Mandatory Fault Reporting Instruction procedures applicable to the Air System/Equipment.</td>
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<td>Special Instructions (Technical) (SI(T)) – detail the arrangements for issuing SI(T).</td>
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<tr>
<td></td>
<td>Fatigue Data – state the arrangements for recording and handling fatigue data.</td>
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<tr>
<td></td>
<td>Joint-Service Responsibilities – detail the procedures for obtaining support from, or providing support to, other Services.</td>
</tr>
<tr>
<td>Facilities</td>
<td>Air System Support – identify the resources required to support the Air System/Equipment, including any Contractor-run maintenance organizations. Accommodation – identify the accommodation and any infrastructure requirements. FsAST – specific where applicable FsAST are located (the FsAST DT provides support for all FsAST).</td>
</tr>
<tr>
<td>Information Technology (IT) Resources</td>
<td>IT System – detail any IT systems that are provided exclusively to support the Air System/Equipment. LIS – detail the utilization of LIS for the Air System/Equipment.</td>
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<tr>
<td>Deployment Plans</td>
<td>Detail the provision for logistic support in response to the build-up of Air System/Equipment deployment, including dispersed deployment. Detail the arrangements necessary to invoke Expedient Repair.</td>
</tr>
</tbody>
</table>
| Product Support – Through Life Management Plan (TLMP) | The TLMP provides the support solution for the Air System/Equipment. It documents the requirement to maintain an effective support system that will include a process for obsolescence management and spares scaling. This section of the SPS must include the arrangements for:  
  - Post-Design Services.  
  - Modifications.  
  - Industry and contractual support.  
  - Post-production support. |
| Supply Support Philosophy            | Delivery Teams are to deliver an assured support solution through the use of the Support Solutions Envelope, which contains four Key Support Areas (KSA):  
  - Sustainability (KSA 1).  
  - Support Engineering (KSA 2).  
  - Joint Support Chain (KSA 3).  
  - Logistics Information (KSA 4).  
Detailed advice and guidance on the application of KSA 3 to individual projects is available from the Supply Chain Support, Support Solutions Teams based at MOD Abbey Wood for Fixed Wing projects and RNAS Yeovilton for Rotary Wing projects. |
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