

RA 4806 - Personnel Requirements (MRP 145.A.30)

Rationale

An organization applying for MRP Part 145 approval is required to appoint a number of positions within the organization, which each have specific responsibilities, and detail them in the Maintenance Organization Exposition (MOE). While Military Maintenance Organizations (MMOs) are not currently required to apply for approval, this RA remains applicable. Without the appointment of specific roles within a Maintenance organization, personnel leadership and management of essential functions could be compromised, thus increasing the Risk of a Maintenance Occurrence, the organization operating outside its scope of work and potentially increasing Risk to Life. This RA describes Maintenance organization roles that require Competent individuals to fulfil their responsibilities and provide Assurance that the organization is compliant with MRP Part 145.

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Definitions

► Definitions Relevant to this RA

1. **Tradesperson.** Suitably Competent and authorized staff¹ responsible for executing Air System Maintenance activities. This role may also be known as Support Staff within Approved Maintenance Organizations (AMOs) or 1st Signature within MMOs.
2. **Supervisor.** Suitably Competent and authorized staff¹ responsible for carrying out supervision of Tradespersons in the execution of their Maintenance activities. In MMO documentation this may be referred to as the 2nd Signature.
3. **Coordinating / Certifying Staff.** Staff holding Authorization by the Maintenance organization to endorse the appropriate Certification of Air System Release and / or Component Release (Air System coordination / Work Order coordination)². In MMOs this role may be referred to as the 3rd Signature. ◀

Regulation 4806(1)

Accountable Manager (Maintenance) (MRP 145.A.30(a))

4806(1) An Accountable Manager (Maintenance) (AM(M)) **shall** be appointed who has a basic understanding of MRP Part 145 and has organizational authority for:

- a. Ensuring that all Maintenance is carried out in compliance with MRP Part 145.

¹ ► Refer to RA 4807 – Certifying Staff and Support Staff (MRP 145.A.35).

² Refer to RA 4812 – Certification of Air System Release and Component Release (MRP 145.A.50). ◀

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4806(1)**

- b. Ensuring that all necessary resources are available to accomplish Maintenance³ and, where applicable, support the organization approval (AMOs only).
- c. Establishing and promoting the Safety and Quality Policy⁴ (AMOs only).

**Acceptable
Means of
Compliance
4806(1)****Accountable Manager (Maintenance) (MRP 145.A.30(a))****Common AMC**

- 4. Nil.

Additional AMC – MMOs only

5. The Aviation Duty Holder (ADH) is required to appoint an individual who is responsible for ensuring that Maintenance is carried out in compliance with MRP Part 145. They **should** have direct access to the Delivery Duty Holder to communicate Safety related issues.

Additional AMC – AMOs only

6. With regard to the AM(M), it is normally intended to mean the Chief Executive Officer (CEO) of the AMO who, by virtue of position, has overall (including in particular financial) Responsibility for running the organization. When the AM(M) is not the CEO, the MAA **should** be assured that such an AM(M) has direct access to the CEO on Safety related issues and has sufficient 'Maintenance funding' allocation.

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4806(1)****Accountable Manager (Maintenance) (MRP 145.A.30(a))****Common GM**

- 7. Nil.

Additional GM – MMOs only

- 8. Nil.

Additional GM – AMOs only

9. The AM(M) may be the AM(M) for more than one AMO and is not necessarily required to be knowledgeable on technical matters, as the MOE defines the Maintenance standards.

10. Where an AMO holds both an approval under MRP Part 145 and a Civil Aviation Authority (CAA) Part 145 ►◄, the post title of AM(M) may be shortened to 'Accountable Manager' for clarity if required. However, this appointment is not to be confused with the Accountable Manager (Military Flying)⁵.

³ Refer to RA 4815(2): Procedures for Good Maintenance Practices (MRP 145.A.65(b)).

⁴ Refer to RA 4815(1): Organization Safety and Quality Policy (MRP 145.A.65(a))

⁵ Refer to RA 1024 – Accountable Manager (Military Flying).

**Regulation
4806(2)**

**Personnel Responsible to the Accountable Manager (Maintenance)
(MRP 145.A.30(b))**

- 4806(2) The organization **shall** nominate a person or group of persons, whose responsibilities include ensuring that the organization complies with MRP Part 145. Such person(s) **shall** ultimately be responsible to the AM(M).
- a. The person(s) nominated **shall** represent the Maintenance management structure of the organization and be responsible for all functions specified in MRP Part 145.
 - b. The person(s) nominated **shall** be identified and their credentials submitted⁶ using an MAA MAOS Form 4 (AMOs only).
 - c. The person(s) nominated **shall** be able to demonstrate relevant knowledge, background and satisfactory experience related to Air Systems or component Maintenance and demonstrate a working knowledge of MRP Part 145.
 - d. Procedures **shall** make clear who deputizes for any particular person in the case of lengthy absence of the said person.

**Acceptable
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**Personnel Responsible to the Accountable Manager (Maintenance)
(MRP 145.A.30(b))**

Common AMC

11. Nil.

Additional AMC – MMOs only

12. An MMO **should** have a Quality Manager and depending on the type and size of MMO, one or more Air System Maintenance Manager(s) and / or Workshop Manager(s) who will hold Responsibility for the Maintenance output of their relevant areas.

13. Individuals to be identified as an MMO's Air System Maintenance Manager or Workshop Manager **should** be appropriately authorized⁷.

14. The individuals identified in this Regulation **should** have direct access to the AM(M). This does not necessarily require the AM(M) to be the individual's direct reporting officer for appraisal purposes.

Additional AMC – AMOs only

15. An AMO **should** have, dependent upon the extent of approval, a Base Maintenance Manager, a Line Maintenance Manager, a Workshop Manager and a Quality Manager, all of whom **should** report to the AM(M) except in a small AMO, where any one manager can also be the AM(M).

16. The Base Maintenance Manager **should** be responsible for ensuring that all Maintenance required to be carried out in the hangar, plus any Fault rectification carried out during Base Maintenance, is carried out to the required³ design and Quality standards. The Base Maintenance Manager **should** also be responsible for any corrective action resulting from the Quality compliance monitoring⁸.

⁶ The MAA MAOS Form 4 can be found on the Maintenance Approved Organization Scheme (MAOS) Approvals page of the MAA Website (<https://www.gov.uk/government/collections/military-aviation-authority-approvals>).

⁷ Refer to RA 1006 – Delegation of Engineering Authorizations and RA 4806(5): Personnel Competences and Authorization (MRP 145.A.30(e)).

⁸ Refer to RA 4815(3): Quality ► **Management** ◀ System (MRP 145.A.65(c)).

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17. The Line Maintenance Manager **should** be responsible for ensuring that all Maintenance required to be carried out on the line, including line Fault rectification, is carried out to the required³ standards and also be responsible for any corrective action resulting from the Quality compliance monitoring⁸.

18. The Workshop Manager **should** be responsible for ensuring that all work on Air System components is carried out to the required³ standards and also responsible for any corrective action resulting from the Quality compliance monitoring⁸.

19. Notwithstanding the example post titles detailed here, the organization can adopt any title for the foregoing managerial positions but AMOs **should** identify to the MAA the titles and persons chosen to carry out these functions on submission of the MAA MAOS Form 4 and in the MOE.

20. Where an organization chooses to appoint managers for all or any combination of the identified MRP Part 145 functions because of the size of the undertaking, these managers **should** report through either the Base Maintenance Manager, Line Maintenance Manager, Workshop Manager or Quality Manager, as appropriate, to the AM(M).

21. Certifying staff can report to any of the managers specified, depending upon which type of control the AMO uses (for example, licensed engineers / Independent Inspection / dual function supervisors etc); however, the Quality compliance monitoring staff⁹ **should** remain independent.

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Material
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Personnel Responsible to the Accountable Manager (Maintenance) (MRP 145.A.30(b))

Common GM

22. Dependent upon the size of the organization, the MRP Part 145 functions may be subdivided under individual managers or combined in any number of ways.

Additional GM – MMOs only

23. Nil.

Additional GM – AMOs only

24. Nil.

**Regulation
4806(3)**

Quality Manager (MRP 145.A.30(c))

4806(3) The AM(M)¹⁰ **shall** appoint a person with Responsibility for monitoring the Quality System, including the associated feedback System⁸. The appointed person **shall** have direct access to the AM(M) to ensure that the AM(M) is kept properly informed on Quality and compliance matters.

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Quality Manager (MRP 145.A.30(c))

25. Monitoring the Quality System **should** include requesting remedial and preventive action, ensuring full root cause analysis, as necessary by the AM(M) and the nominated persons¹¹.

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Material
4806(3)**

Quality Manager (MRP 145.A.30(c))

26. Nil.

⁹ Refer to RA 4806(3): Quality Manager (MRP 145.A.65(c)).

¹⁰ Refer to RA 4806(1): Accountable Manager (Maintenance) (MRP 145.A.30(a)).

¹¹ Refer to RA 4806(2): Personnel Responsible to the Accountable Manager (Maintenance) (MRP 145.A.30(b)).

**Regulation
4806(4)**

Maintenance Working Hours Plan (MRP 145.A.30(d))

4806(4) The organization **shall** have a Maintenance working hours plan demonstrating that the organization has the workforce capacity and Competence to carry out the scope of its approval, and that the workforce is of sufficient quantity and appropriate composition to plan, perform, supervise, inspect and Quality monitor the organization. In addition, the organization **shall** have a procedure to reassess work intended to be carried out when actual staff availability is less than the planned staffing level for any particular work shift or period.

**Acceptable
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4806(4)**

Maintenance Working Hours Plan (MRP 145.A.30(d))

Common AMC

27. Nil.

Additional AMC – MMOs only

28. Where an MMO utilizes Contracted staff, the relevant Maintenance Manager **should** ensure that they adhere to the appropriate Regulations and procedures.

29. In cases where an MMO is required to deviate from the Maintenance working hours plan to meet a temporary increase in the required output (for example, in support of an increase in flying task), the relevant Maintenance Manager **should** report the deviation to the AM(M) in order to assess any Air Safety implications and, if necessary, establish appropriate mitigation strategies. Likewise, if adequate staffing levels cannot be maintained, the AM(M) **should** consider the need for a commensurate reduction in Maintenance tasking, in discussion with the ADH chain where appropriate.

Additional AMC – AMOs only

30. The organization **should** demonstrate that they have appropriate workforce capacity by meeting either one, or both, of the following conditions:

- a. Employ or contract staff such that at least half the staff who perform Maintenance in each workshop, hangar or flight line on any shift are employed to ensure organizational stability (definitions of 'employed' and 'Contracted' are contained within the Guidance Material to this Regulation).
- b. Ensure organizational stability by demonstration in the Maintenance working hours plan of the organization's active assessment and management of:
 - (1) Staff experience.
 - (2) Staff time in post.
 - (3) Supervision ratios.
 - (4) Staff turnover rates which **▶should◀** be below 50% of the staff who perform Maintenance in each workshop, hangar or flight line on any shift in a rolling 12-month period (method of calculation is contained within the Guidance Material to this Regulation).

31. Contract staff, being part time or full time **should** be made aware that when working for the organization they are subjected to compliance with the organization's procedures specified in the MOE relevant to their duties.

32. The Maintenance working hours plan **should** take into account any Maintenance carried out on Air Systems and / or components from outside the UK and **should** also take into account all work carried out outside the scope of the MRP Part 145 approval.

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33. The Maintenance working hours plan **should** relate to the anticipated Maintenance workload.
34. In the case of Air System Base Maintenance, the Maintenance working hours plan **should** relate to the Air System hangar visit plan¹².
35. The Quality monitoring compliance function working hours **should** be sufficient to meet the Quality System requirement⁸. Where Quality-monitoring staff perform other functions, the time allocated to such functions **should** be taken into account in determining Quality monitoring staff numbers.
36. The Maintenance working hours plan **should** be reviewed at least every 3 months and updated when necessary.
37. Significant deviation from the Maintenance working hours plan **should** be reported through the departmental manager to the Quality Manager and the AM(M) for review.

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Material
4806(4)**

Maintenance Working Hours Plan (MRP 145.A.30(d))

Common GM

38. The 'Maintenance working hours plan' is a document or set of documents that demonstrate what the organization is able to achieve with the actual workforce resource available and, where applicable for 'line' or 'forward' Air System Maintenance organizations, the Air System Flying Hours that can be made available as a result of this Maintenance.

Additional GM – MMOs only

39. An MMO's Maintenance working hours plan may be developed and held by a higher military formation, but individual MMOs will be expected to have access to, and an understanding of, their plan.

40. An MMO's Maintenance working hours plan may be supplemented by several separate plans to cater for differing circumstances, for example, Air System Maintenance organizations supporting expeditionary operations or exercises. However, in all instances, the plan will demonstrate that staff levels are adequate to safely perform the functions specified in this Regulation.

Additional GM – AMOs only

41. For the purpose of this Regulation, 'employed' means the person is directly employed by the Maintenance organization approved under MRP Part 145 or the person is a Contractor who has been engaged in one role for a minimum of 6 months. 'Contracted' means the person is employed by another organization and Contracted by that organization to the Maintenance organization approved under MRP Part 145 (with the exception of the 6 months in one role criterion described above, where the Contracted person is considered to be 'employed').

42. In the case of MOD / industrial partnered support arrangements in an AMO, the MOD element of the organization will be considered, for the purpose of this clause, as part of the AMO's 'employed' workforce.

43. Turnover rate is calculated as the number of persons who departed divided by the average number of persons who performed Maintenance, over the rolling 12-month period.

44. 'Maintenance workload' includes all necessary work such as, but not limited to, planning, Maintenance record checks, production of worksheets / cards in paper or electronic form, accomplishment of Maintenance, inspection and the completion of Maintenance records.

45. Significant deviation means more than a 25% shortfall in available working hours during a calendar month for any one of the functions specified in this Regulation.

¹² Refer to RA 4805(1): Facility Requirements (MRP 145.A.25(a)).

**Regulation
4806(5)**

Personnel Competences and Authorization (MRP 145.A.30(e))

4806(5) The organization **shall** establish the Competence and control the Authorization of personnel involved in any Maintenance, management and / or Quality Audits. In addition to the necessary expertise related to the job function, Competence **shall** include:

- a. An understanding of the application of Human Factors and Human Performance issues to that person's function in the organization;
- b. ► **Electrical Wiring Interconnection System (EWIS) awareness training.** ◀

AMOs **shall** detail the procedure for such Competence assessment and the standard to be achieved in their MOE.

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Personnel Competences and Authorization (MRP 145.A.30(e))

Common AMC

► **EWIS Training**

46. Personnel¹³ who maintain Air Systems with electrical Systems, **should** receive EWIS awareness training. The aim of this training is to reduce damage caused to electrical Systems whilst carrying out Maintenance on the Air System. Refresher training **should** be completed every 2 years as a minimum.

47. As a minimum this training **should** include the following topics:

- a. General EWIS Safety practises.
- b. Wires - typical damage and areas found (Air System specific), Electrical bonding and grounds.
- c. Housekeeping - know the contamination sources, materials, cleaning and protection procedures.
- d. Connective devices - know or demonstrate the procedures to identify, inspect, and find the correct Repair for typical types of connective devices found on the applicable Air System. ◀

Additional AMC – MMOs only

Competence Assessment and Authorization

48. ► **Tradespersons** ◀ who maintain Air Systems, Air System components and associated equipment, including Contractor staff, **should** be trained, assessed as Competent¹⁴ and authorized for specific tasks and roles, including, but not limited to:

- a. All personnel required to sign Maintenance documentation, noting the additional requirements detailed in Paragraphs ► **49-51** ◀.
- b. Self-supervisors.
- c. Elementary self-supervisors.
- d. Personnel using Ground Maintenance Systems.
- e. Personnel required to carry out ground runs on engines and / or Auxiliary Power Units, whether installed in ► **Aircraft**, ◀ in an engine training facility, or in an uninstalled engine test facility.
- f. Aircraft Ground Engineers, in the sense of those individuals deployed with Air Systems to undertake a wide range of Air System type flight servicing and Maintenance activities with minimal technical support.
- g. Survival Equipment Maintenance staff.

¹³ ► This includes Aircrew who carry out Maintenance. ◀

¹⁴ Refer to RA 1002 – Airworthiness Competent Persons.

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h. Ground Support Equipment Maintenance staff.

49. The individuals conducting a Competence assessment of personnel employed in Air System Maintenance **should** ensure that those being assessed have received an appropriate level of training or familiarization on the Air System type before being authorized to undertake Maintenance or servicing activities ► **as Tradesperson, Supervisor or Coordinator / Certifying Staff.** ◀ on that Air System type.

50. Individuals receiving an Authorization to undertake the duties of ► **the Tradesperson** ◀, **should** first receive an element of type-specific training and / or familiarization appropriate to the scope of their Authorization. Good practice is for such training to be that which leads to the award of a formal qualification in the Air System type; consideration to introducing this qualifying criteria for ► **Tradespersons** ◀ **should** be given by the Chief Air Engineer.

51. The individuals conducting a Competence assessment of personnel employed in Air System component / equipment Maintenance **should** ensure that those being assessed have received training and / or familiarization on the relevant component(s) / equipment(s) appropriate to their level of Authorization.

52. Engineering Authorizations **should** be recorded using a system that is auditable.

53. ► **Tradespersons** ◀ within an MMO who are required to undertake Maintenance on Air Systems from another Service or nation **should** only do so if appropriately authorized.

Additional AMC – AMOs only

Competence Assessment and Authorization

54. The MOE procedure **should** require, amongst others, that planners, ► **Tradespersons** ◀, specialized services staff, ► **Supervisors and Coordinating / Certifying Staff** ◀ are assessed for Competence by 'on the job' evaluation and / or by examination relevant to their particular job role within the organization, before unsupervised work is permitted.

55. A record of the qualification and Competence assessment **should** be kept.

56. The Maintenance organization **should** have in place procedures for:

- a. Ensuring that all personnel are Competent by virtue of their training and experience for the tasks on which they are employed.
- b. Ensuring staff are trained, assessed and authorized for specific tasks.
- c. Providing initial and continuation training by a suitable organization.
- d. Maintaining a record system detailing the training and qualification of all staff.
- e. Maintaining a record of all personnel Authorizations.

57. The MOE procedure **should** include a method of assessing the training and experience of personnel joining the organization and **should** include, as a minimum:

- a. Verification of any qualifications and experience.
- b. A formal technical interview.
- c. A period of on the job assessment.

58. Adequate initial and recurrent training **should** be provided and recorded to ensure continued Competence.

59. To assist in the assessment of Competence, job descriptions are recommended for each job role in the organization. The Competence assessment **should** establish that:

- a. Planners are able to interpret Maintenance requirements into Maintenance tasks and have an appreciation that they have no authority to deviate from the Technical Information (TI).

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- b. ▶ **Tradespersons** ◀ are able to carry out Maintenance tasks to any standard specified in the TI and will notify ▶ **Supervisors** ◀ of mistakes requiring rectification to re-establish required Maintenance standards.
- c. Specialized services staff are able to carry out specialized Maintenance tasks to the standard specified in the TI and will both inform and await instructions from their ▶ **Supervisor** ◀ in any case where it is not possible to complete the specialized Maintenance in accordance with (iaw) the TI.
- d. ▶ **Supervisors** ◀ are able to ensure that all required Maintenance tasks are carried out and where not completed or where it is evident that a particular Maintenance task cannot be carried out to the TI, then such problems will be reported to the Quality Manager⁹ for appropriate action. In addition, for those ▶ **Supervisors** ◀ who also carry out Maintenance tasks, that they understand such tasks **should not** be undertaken when incompatible with their management responsibilities.
- e. ▶ **Coordinating / Certifying Staff** ◀ are able to determine when the Air System or Air System component is Serviceable and when it is Unserviceable.

60. Planners, specialized services staff, ▶ **Supervisors** ◀ and ▶ **Coordinating / Certifying Staff** ◀ **should** have a knowledge of organization procedures relevant to their particular role in the organization. The aforementioned list is not exclusive and can include other categories of personnel.

61. Quality Audit staff **should** monitor compliance with MRP Part 145, identifying non-compliance in an effective and timely manner in order that the organization remains in compliance with MRP Part 145.

Human Factors Training

62. In respect to the understanding of the application of Human Factors and Human Performance issues, Maintenance, management, and Quality Audit personnel in AMOs **should** be assessed for the need to receive initial Human Factors training¹⁵, but in any case all Maintenance, management, and Quality Audit personnel in AMOs **should** receive Human Factors continuation training. As a minimum, this **should** concern:

- a. Post-holders, managers ▶ ◀.
- b. ▶ **Tradespersons, Supervisors and Coordinating / Certifying Staff** ◀
- c. Technical support personnel, such as, planners ▶ ◀ and technical record staff.
- d. Quality control / Assurance staff.
- e. Specialized services staff.
- f. Human Factors staff / Human Factors trainers.
- g. Store department staff and purchasing department staff.
- h. Ground equipment operators.
- i. Contract staff in the above categories.

63. Depending on the result of the Competence assessment as specified in Paragraph ▶ **59** ◀, initial training **should** be provided to personnel during their induction into the Maintenance organization. Consideration **should** be given to training temporary staff soon after they join the organization in order to recognize the duration of their employment.

64. Personnel being recruited from another AMO and temporary staff **should** be assessed for the need to receive any additional Human Factors training to meet the Human Factors training standard of the new AMO.

65. The purpose of Human Factors continuation training is primarily to ensure that staff remain current in terms of Human Factors and also to collect feedback on Human Factors issues. Training **should** have the involvement of the Quality department.

¹⁵ Refer to RA 1440 – Air Safety Training.

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There **should** be a procedure to ensure that feedback is formally passed from the trainers to the Quality department to initiate action where necessary.

66. Human Factors continuation training **should** be of an appropriate duration in each 2-year period in relation to relevant Quality Audit findings and other internal / external sources of information available to the organization on Human Errors in Maintenance.

67. Human Factors training **should** be conducted by the AMO itself, or independent trainers, or a suitable training organization.

68. The Human Factors training procedures **should** be specified in the MOE.

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Personnel Competences and Authorization (MRP 145.A.30(e))

Common GM

69. ► CAA AMC¹⁶ provides useful material for personnel creating EWIS training syllabi. ◀

70. 'Human Factors' is defined in MAA02¹⁷. 'Human Performance' means human capabilities and limitations which have an impact on the Safety and efficiency of aeronautical operations.

71. For all relevant personnel in the Defence Air Environment, Human Factors training requirements¹⁵ must be followed.

► ◀

72. ► ◀

Additional GM – MMOs only

73. For the servicing of Air Systems belonging to one nation by personnel of a different nation, Commands may negotiate cross-servicing agreements appropriate to their operational commitments.

Additional GM – AMOs only

74. Initial Human Factors training ► will ◀ cover the topics of the training syllabus specified in Annex A to this Regulation, either as a dedicated course or else integrated within other training. The syllabus may be adjusted to reflect the particular nature of both the organization and the functions within the organization.

Regulation 4806(6)

Specialized Services (MRP 145.A.30(f))

4806(6) The organization **shall** ensure that:

- a. Personnel who carry out and / or control Continued Airworthiness Non-Destructive Testing (NDT) of Air System Structures and / or components are appropriately qualified for the particular NDT iaw a recognized standard.
- b. ► Personnel who carry out and / or control the application of surface finish of Air System Structures and / or components are appropriately qualified for the particular surface finish task. ◀
- c. Personnel who carry out any other specialized task ► are ◀ appropriately qualified iaw officially recognized standards.

¹⁶ ► AMC and GM for Acceptable Means of Compliance for Airworthiness of Products, Parts and Appliances (AMC-20-22). ◀

¹⁷ Refer to MAA02: MAA Master Glossary.

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Specialized Services (MRP 145.A.30(f))

Common AMC

75. ► **NDT.** ◀ Personnel who carry out and / or control NDT of Air System Structures and / or components **should** be appropriately qualified iaw BS EN 4179¹⁸, or equivalent.
76. Any such personnel who intend to carry out and / or control NDT for which they were not qualified prior to the effective date of MRP Part 145, **should** qualify for such NDT iaw BS EN 4179, or equivalent.
77. ► **Aircraft Surface finish.** Surface finish activities **should** be carried out by **Competent specialized organizations with appropriately qualified personnel. Training for persons undertaking and authorizing surface finish activities **should** as a minimum, meet the national standards for Aircraft surface finish¹⁹:**
- a. **SEMAER233 - preparing Aircraft component coatings / finishes for application.**
 - b. **SEMAER235 - applying coatings / finishes to Aircraft components by hand.**
 - c. **SEMAE3090 - applying coatings / finishes to Aircraft components by spray gun.**
 - d. **SEMAE3091 - carrying out the application of transfers, decals and livery to Aircraft components.**
78. **Tradesperson, Supervisors, Coordinating / Certifying Staff can carry out minor surface finish activities as Maintenance tasks iaw the Air System Document Set.** ◀

Additional AMC – MMOs only

79. Nil.

Additional AMC – AMOs only

80. ► **NDT.** ◀ Notwithstanding the general references in BS EN 4179 to a national aerospace NDT board, all examinations and training **should** be conducted by personnel or organizations under the general control of such a board. The referenced standards, methods, training, experience levels and procedures **should** be specified in the MOE.
81. An AMO that carries out NDT **should** establish NDT specialist qualification procedures, detailed in the MOE and accepted by the MAA.
82. Boroscopy and other techniques such as delamination coin tapping are non-destructive inspections rather than NDT. Notwithstanding such differentiation, AMOs **should** establish a procedure in their MOE, accepted by the MAA, to ensure that personnel who carry out and interpret such inspections are properly trained and assessed for their Competence with the process. Organizations undertaking non-destructive inspections do not require a D1 class rating approval²⁰.

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Specialized Services (MRP 145.A.30(f))

Common GM

83. 'Continued Airworthiness NDT' means such testing specified by TI for the purpose of determining the continued fitness of the product to operate safely.
84. Notwithstanding the fact that the organization's Responsible Level 3 may be qualified to establish and authorize methods, techniques, etc, this does not permit such personnel to deviate from methods and techniques published by the Type Airworthiness Authority in the form of TI, such as in NDT manuals or Service Bulletins, unless the manual or Service Bulletin expressly permits such deviation.

¹⁸ BS EN 4179 – Aerospace series. Qualification and approval of personnel for non-destructive testing.

¹⁹ ► **National Occupational Standards (NOS) are detailed at <https://www.ukstandards.org.uk/>.** ◀

²⁰ Refer to RA 4804 – Terms of Approval (MRP 145.A.20) - Approved Maintenance Organizations only.

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85. 'Particular NDT' means any one or more of the following:
- a. Penetrant testing.
 - b. Magnetic testing.
 - c. Eddy current testing.
 - d. Ultrasonic testing.
 - e. Radiographic testing.
 - f. Thermographic testing.
 - g. Shearographic testing.

Additional GM – MMOs only

86. Personnel will become qualified on the successful completion of NDT training, consolidation and examinations appropriate to the level of NDT qualification being sought.

87. Authorization to conduct NDT will be withdrawn if an individual's qualification becomes invalid. The relevant authorizing individual may re-authorize personnel once the lapsed qualification element(s) has been reassessed and certified as being complete. A Responsible Level 3 can advise on the re-Authorization action required. Under exceptional or operational requirements, the relevant authorizing individual may extend the validity of an NDT Authorization to meet a specific need.

88. NDT Authorizations will be recorded²¹.

89. When MMOs do not have the necessary organic NDT capability, additional services may be requested from specialist organizations (such as 1710 NAS and 71(IR) Squadron or an appropriate AMO with a D1 rating) that are specifically authorized to task the relevant NDT organizations.

Additional GM – AMOs only

90. Nil.

**Regulation
4806(7)**

**Air System Certifying Staff (Line Maintenance) (MRP 145.A.30(g)) -
Approved Maintenance Organizations only**

4806(7) An AMO undertaking Air System Line Maintenance **shall** have appropriate ► **Coordinating / Certifying Staff** ◀ qualified on each relevant Air System type and, where applicable, ► **Tradespersons and Supervisors** ◀, suitably authorized for Line Maintenance activities¹.

**Acceptable
Means of
Compliance
4806(7)**

**Air System Certifying Staff (Line Maintenance) (MRP 145.A.30(g)) -
Approved Maintenance Organizations only**

91. In the case of an AMO using certifying staff licensed iaw CAA Part 66 ► ◀, a suitable number of Category B1 and B2 certifying staff **should** be employed and authorized¹. The use of appropriately qualified Category A personnel to conduct minor Preventative Line Maintenance and simple Fault rectification **should not** replace this requirement for Category B1 and B2 staff.

92. In the case of an AMO adopting military processes, including the use of the MOD Form 700 as the Air System technical log, and the associated Authorization framework, a suitable number of personnel **should** be employed who are authorized to:

- a. Undertake the responsibilities of '1st signature', '2nd signature' and '3rd signature' ► **(Tradesperson, Supervisor and Coordinating / Certifying Staff)** ◀ for Maintenance tasks.
- b. Undertake and coordinate flight servicing activities.

²¹ Refer to RA 4806(5): Personnel Competences and Authorization (MRP 145.A.30(e)).

**Acceptable
Means of
Compliance
4806(7)**

- c. Endorse the Certification of Air System Release².

**Guidance
Material
4806(7)**

**Air System Certifying Staff (Line Maintenance) (MRP 145.A.30(g)) -
Approved Maintenance Organizations only**

93. The following Guidance Material is applicable to AMOs employing certifying staff licensed iaw CAA Part 66 ►◄ in a Line Maintenance environment:

- a. 'Minor scheduled Line Maintenance' means any minor scheduled inspection / check up to and including a weekly check specified in the approved Aircraft Maintenance Programme²² (or equivalent), in a Line Maintenance environment²³.
- b. Where the AMO uses appropriately authorized Category A ► **Tradespersons** ◄ to carry out minor scheduled Line Maintenance and simple Fault rectification, Category B1 and B2 staff need not always be present at the line station during such activity.
- c. The following list contains typical tasks that a Category A ► **Tradesperson** ◄ could carry out after appropriate task training, as part of minor scheduled Line Maintenance or simple Fault rectification:
- (1) Replacement of wheel assemblies and brake units.
 - (2) Replacement of simple crew escape and emergency equipment (excluding Aircraft Assisted Escape Systems (AAES)).
 - (3) Replacement of internal and external lights, filaments and flash tubes.
 - (4) Replacement of windscreen wiper blades.
 - (5) Replacement of seats (excluding AAES), seat belts and harnesses.
 - (6) Closing of cowlings and re-fitment of quick access inspection panels.
 - (7) Replacement of static wicks / static dischargers.
 - (8) Replacement of Air System batteries.
 - (9) Routine lubrication and replenishment of fluids and gases.

**Regulation
4806(8)**

**Air System Certifying Staff (Base Maintenance) (MRP 145.A.30(h)) -
Approved Maintenance Organizations only**

4806(8) An AMO undertaking Air System Base Maintenance **shall** have appropriate ► **Coordinating / Certifying Staff** ◄ qualified on each relevant Air System type and, where applicable, ► **Tradespersons and Supervisors** ◄, suitably authorized for Base Maintenance activities¹.

**Acceptable
Means of
Compliance
4806(8)**

**Air System Certifying Staff (Base Maintenance) (MRP 145.A.30(h)) -
Approved Maintenance Organizations only**

94. In the case of an AMO using certifying staff licensed iaw CAA Part 66 ►◄ to conduct Base Maintenance, a suitable number of appropriate Air System type-qualified Category C certifying staff **should** be employed and authorized²¹. In addition, the AMO **should** have sufficient Air System type-qualified staff qualified as Category

²² Refer to RA 4961 – Aircraft Maintenance Programme (MRP Part M Sub Part C).

²³ Refer to RA 4802(1): Scope of the MRP Part 145 (MRP 145.A.10(a)).

**Acceptable
Means of
Compliance
4806(8)**

B1 and B2 and authorized¹ to support the Category C ► **Coordinating / Certifying Staff** ◀. In this instance, the following process **should** be followed:

- a. The Category B1 and B2 ► **Tradespersons and Supervisor** ◀ **should** ensure that all relevant tasks or inspections have been carried out to the required standard before the Category C certifying staff endorses the Certification of Air System Release.
- b. The Category C ► **Coordinating / Certifying Staff** ◀ **should** ensure compliance with sub-Paragraph ► **94a** ◀ and that all work required by the customer has been accomplished during the particular work package. They **should** also assess the impact of any work not carried out with a view to either requiring its accomplishment or agreeing with the Military Continuing Airworthiness Management Organization or MOD Contracting Authority to defer such work to another specified check or time limit.

95. In the case of an AMO adopting military processes, including the use of the MOD Form 700 as the Air System technical log, and the associated Authorization framework, a suitable number of personnel **should** be employed who are authorized to:

- a. Undertake the responsibilities of '1st signature', '2nd signature' and '3rd signature' ► **(Tradesperson, Supervisor and Coordinating / Certifying Staff)** ◀ Maintenance tasks.
- b. Endorse the Certification of Air System Release².

**Guidance
Material
4806(8)**

Air System Certifying Staff (Base Maintenance) (MRP 145.A.30(h)) - Approved Maintenance Organizations only

96. Nil.

**Regulation
4806(9)**

Component Certifying Staff (MRP 145.A.30(i))

4806(9) Any organization undertaking component Maintenance **shall** have appropriately qualified ► **Tradesperson, Supervisor and Coordinating / Certifying Staff** ◀, to be suitably authorized for component Maintenance activities¹.

**Acceptable
Means of
Compliance
4806(9)**

Component Certifying Staff (MRP 145.A.30(i))

► **Common AMC** ◀

97. Nil.

► **Additional AMC – MMOs only**

98. Persons certifying the Certification of Component Release following Maintenance **should** be appropriately authorized²¹.

Additional AMC – AMOs only

99. Certification of Component Release following Maintenance **should** be by appropriately authorized²¹ **Coordinating / Certifying Staff**. ◀

**Guidance
Material
4806(9)**

Component Certifying Staff (MRP 145.A.30(i))

100. Nil.

**Regulation
4806(10)**

Non-engineering Staff (MRP 145.A.30(j))

4806(10) Non-engineering staff, including Aircrew, **shall** only be permitted to undertake Air System Maintenance and / or flight servicing when authorized. Where applicable, AMOs **shall** detail the procedure to grant such Authorization in the MOE.

**Acceptable
Means of
Compliance
4806(10)****Non-engineering Staff (MRP 145.A.30(j))****Common AMC**

101. Nil.

Additional AMC – MMOs only

102. Aircrew required to undertake Maintenance and / or flight servicing tasks **should** undertake a Competence assessment prior to Authorization.

Additional AMC – AMOs only

103. The MOE procedure **should** ensure that the scope of permitted Air System Maintenance and / or flight servicing is specified in the Authorization.

**Guidance
Material
4806(10)****Non-engineering Staff (MRP 145.A.30(j))**

104. The requirements¹ for the Authorization of personnel who undertake Maintenance tasks on Air Systems must be adhered to.

ANNEX A**HUMAN FACTORS TRAINING SYLLABUS (AMOs ONLY)**

1. The training syllabus below identifies the topics and sub-topics to be addressed during Human Factors training for personnel in an AMO. The Maintenance organization may combine, divide or change the order of any subject of the syllabus to suit its own needs, so long as all subjects are covered to a level of detail appropriate to the organization and its personnel. Some of the topics may be covered in separate training (Health and Safety, Management, Supervisory Skills, etc.), in which case duplication of training is not necessary.
2. Where possible, practical illustrations and examples will be used, especially Accident and Incident reports. Topics will also need to be related to Maintenance where possible; too much unrelated theory will need to be avoided.
3. Required training topics and sub-topics are as follows:
 - a. General / Introduction to Human Factors:
 - (1) Need to address Human Factors.
 - (2) Statistics.
 - (3) Incidents.
 - b. Safety Culture / Organizational factors.
 - c. Human Error:
 - (1) Error models and theories.
 - (2) Types of errors in Maintenance tasks.
 - (3) Violations.
 - (4) Implications of errors.
 - (5) Avoiding and managing errors.
 - (6) Human reliability.
 - d. Human performance and limitations:
 - (1) Vision.
 - (2) Hearing.
 - (3) Information-processing.
 - (4) Attention and perception.
 - (5) Situational awareness.
 - (6) Memory.
 - (7) Claustrophobia and physical access.
 - (8) Motivation.
 - (9) Fitness / Health.
 - (10) Stress.
 - (11) Workload management.
 - (12) Fatigue.
 - (13) Alcohol, medication, drugs.
 - (14) Physical work.
 - (15) Repetitive tasks / complacency.
 - e. Environment:
 - (1) Peer pressure.
 - (2) Stressors.

- (3) Time pressure and deadlines.
 - (4) Workload.
 - (5) Shift Work.
 - (6) Noise and fumes.
 - (7) Illumination.
 - (8) Climate and temperature.
 - (9) Motion and vibration.
 - (10) Complex Systems.
 - (11) Hazards in the workplace.
 - (12) Lack of workforce.
 - (13) Distractions and interruptions.
- f. Procedures, information, tools and practices:
- (1) Visual Inspection.
 - (2) Work logging and recording.
 - (3) Procedure – practice / mismatch / norms.
 - (4) Technical documentation – access and Quality.
- g. Communication:
- (1) Shift / Task handover.
 - (2) Dissemination of information.
 - (3) Cultural differences.
- h. Teamwork:
- (1) Responsibility.
 - (2) Management, supervision and leadership.
 - (3) Decision making.
- i. Professionalism and integrity:
- (1) Keeping up to date / currency.
 - (2) Error provoking behaviour.
 - (3) Assertiveness.
- j. Organization's Human Factors program:
- (1) Reporting errors.
 - (2) Disciplinary policy.
 - (3) Error investigation.
 - (4) Action to address problems.
 - (5) Feedback.

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