

AUSTRALIAN DEFENCE STANDARD
RAAF STD (ENG) T5022
REQUIREMENTS FOR CIVILIAN PERSONNEL MAINTAINING
STATE AIRCRAFT AND AERONAUTICAL PRODUCT
NOTICE NO 1
JULY 2006

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ROYAL AUSTRALIAN AIR FORCE



RAAF STANDARD ENGINEERING

T5022

REQUIREMENTS FOR THE MAINTENANCE OF STATE AIRCRAFT AND AIRCRAFT EQUIPMENT BY CIVILIAN TRADESPERSONS

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SECTION 1

INTRODUCTION

1. ADF airworthiness doctrine requires that aircraft and aircraft equipment be maintained to approved standards by competent and authorised individuals acting as members of an approved organisation and whose work is both certified as correct and accepted on behalf of the ADF. Within the ADF, technical personnel are appropriately trained and authorised to undertake maintenance activities; thus satisfying the doctrine. This standard sets out the criteria required for civilian staff, either in the capacity of Defence civilians or in commercial support, employed on the maintenance of ADF aircraft and associated equipment. Maintenance organisations or individuals conducting or managing maintenance on ADF aircraft or aircraft equipment, are invited to propose improvements to this standard. All comments/anomalies in relation to this standard should be directed to the Sponsor - DAIRMAINT.

AIM

1.1 The aim of this standard is to ensure that appropriately qualified and authorised aircraft tradespersons carry out maintenance tasks on aircraft or aircraft equipment for which the ADF has airworthiness responsibility.

SCOPE

1.2 This standard contains criteria for the conduct of maintenance, at venues within Australia and New Zealand, by civilian maintenance organisations, civilian tradespersons and Defence civilians, on ADF aircraft and equipment and sets out criteria that are equivalent to, but not greater than, those which are applied to ADF tradespersons and maintenance venues.

1.3 The conduct of maintenance on aircraft and aircraft equipment by civilian maintenance organisations will not be subject to the dictates of ADF preparedness for operational environments and, therefore, does not necessitate the development of individuals to the same level as ADF tradespersons. Accordingly, greater flexibility to employ non-tradespersons will generally be available.

1.4 This standard has been aligned with the Australian National Aerospace Trade Curriculum and Associated Competencies, in accordance with the Domestic Airline Industry Restructure, and does not specify aerospace trade qualification systems for maintenance organisations located outside of Australia or New Zealand. Where maintenance contracts are being performed out of Australia or New Zealand by foreign maintenance organisations, the minimum requirements for maintenance performed on Australian State aircraft should be equivalent to those specified in this standard.

DEFINITIONS

1.5 Unless otherwise specified to the contrary, words and phrases used in this standard have the meanings expressed in the Australian Macquarie Dictionary.

1.5.1 **ADF.** Australian Defence Force.

1.5.2 **Aircraft Life Support Equipment (Aircraft LSE).** The class of aeronautical equipment that is used by aircrew and aircraft passengers to sustain life during normal flight conditions and emergencies, and to enhance survival during and after ejection, bail-out, ditching, forced landing or crash in combat or peacetime environments. The class has nominal subdivisions of; Aircrew-Worn LSE, Aircraft-Mounted LSE, Survival Equipment, Oxygen Systems, Avionics LSE and Ejection Devices.

- 1.5.3 Aircraft Maintenance Engineer (AME).** An 'On Aircraft Maintenance' tradesperson who has completed an aerospace apprenticeship/traineeship, or has been assessed via Recognition of Current Competencies (RCC) as having satisfied the minimum National Aeroskills Competency Standards, which has led to the award of:
- a. a Certificate of Proficiency - AME (Airframe, Engine, Electrical, Instrument, Radio or Aircraft Structures/Aircraft Sheetmetal) issued under the authority of the applicable State Training Board or New Zealand Qualification Association; or
 - b. a Certificate of Proficiency - AME (Mechanical, Avionics or Structures) issued by a registered training provider under the authority of the applicable State Training Board or New Zealand Qualification Association.
- 1.5.4 Aircraft Mechanic (AM).** An 'Off Aircraft Maintenance' tradesperson who has completed an aerospace apprenticeship/traineeship, or has been assessed via RCC as having satisfied the minimum National Aeroskills Competency Standards, which has led to the award of:
- a. a Certificate of Proficiency - AM (Airframe, Engine, Electrical, Instrument, Radio or Aircraft Structures/Aircraft Sheetmetal) issued under the authority of the applicable State Training Board or New Zealand Qualification Association; or
 - b. a Certificate of Proficiency - AM (Mechanical, Avionics or Structures) issued by a registered training provider under the authority of the applicable State Training Board or New Zealand Qualification Association.
- 1.5.5 Aircraft Tradesperson.** A person who has completed all relevant off job training and can demonstrate on job competence that would lead to the award of the applicable trade certificate of proficiency by the State Accreditation Board or New Zealand Qualification Association, or a person who holds an ADF issued aircraft trade certificate.
- 1.5.6 Aircrew Egress System.** An aircrew egress system comprises all components, including explosive components and other energy sources, which contribute to the ejection of an aircraft's crew from an aircraft, and their subsequent safe recovery and survival.
- 1.5.7 Apprentice.** A person who is undergoing formal off-job and on-job training, normally four years in duration, that will lead to the award of an appropriate trade Certificate of Proficiency. For aerospace trade apprentices, this must be in accordance with the nationally recognised Aeroskills Training Package requirements.¹
- 1.5.8 Army.** Australian Army.
- 1.5.9 CASA.** Civil Aviation Safety Authority, Australia.
- 1.5.10 Civilian Tradesperson.** Contract aircraft tradespersons and Defence civilian aircraft tradespersons.

1. The national requirement for apprentices is the completion of those National Aerospace Competency Standards detailed in the Aeroskills Training Package, which are required for the award of a Certificate IV in Aerospace in an appropriate trade. Additionally the nationally accepted, although not compulsory, trade curriculum for aerospace apprenticeships is the National Aerospace Trade Curriculum (or equivalent New Zealand Qualification Association requirements).

1.5.11 Critical Maintenance Operation. A critical maintenance operation (CMO) is a maintenance operation which, unless strictly performed in accordance with prescribed standards and practices, could jeopardise aircraft and/or personnel safety. Consolidated listings of CMOs will be contained in maintenance documentation specific to aircraft type. Independent Inspection (see definition below) is mandatory for CMOs. As a minimum requirement, any maintenance operation performed on the following controls, systems and equipment shall be classified as a CMO:

- a. **Flying Controls.** Flying controls include all components and parts, the movement of which, in the functional sense, whether manual, power operated or power assisted, or electrical, results in operation of the aircraft's movable aerodynamic surfaces (including flaps, aileron, rudder, elevator, air brakes, braking parachutes, trimming controls, helicopter rotor pitch change gear and dual control systems together with their associated hydraulic, electrical and electronic systems).
- b. **Engine Controls.** Engine controls include all components and parts, the movement of which, in the functional sense, controls the power output of the engine (including propeller pitch, fuel delivery and control systems, engine air inlet controls and reverse thrust controls, together with their associated systems).
- c. **Undercarriage Controls.** Undercarriage controls include all components and parts, the movement of which, in the functional sense, results in operation of the aircraft undercarriage (including retracting and lowering mechanisms including doors, up and down locking, steering and wheel braking, together with their associated systems).
- d. **Associated System Equipment.** All systems and equipment such as power flying control reversing systems, artificial feel systems, pitot static systems, auto-stabilisers, auto-pilots, stability augmentation systems, flight control computers/actuators, flight critical software/firmware, aerial refueling systems, fuel dump systems, fire extinguishing systems, power-train (including engine and transmission) lubrication systems and other equipment which is connected with, and has a direct effect on, the aircraft flying, engine or undercarriage control systems.
- e. **Emergency and Auxiliary Systems.** Emergency and auxiliary systems include all aircraft systems which are designed to function in an emergency to prevent injury to personnel or the loss or damage of an aircraft.
- f. **Oxygen Systems.** Except replenishment.
- g. **Explosive Ordnance and Associated Equipment.** Including:
 - (1) Maintenance (except Flight Servicing) of equipment (e.g. aircrew escape systems, guillotine cable cutters) which contains explosive ordnance during the maintenance operation.
 - (2) Maintenance of equipment which is operated by explosive ordnance and cannot be otherwise functionally tested after assembly/installation and where correct operation of the equipment is critical to the safety and survival of personnel and/or the survival of aircraft.
 - (3) Preparation and disassembly of explosive ordnance where specified in the applicable preparation manual.
 - (4) Loading and unloading explosive ordnance when specified in the applicable loading manual.

1.5.12 Ex-ADF Aircraft Tradesperson. A person who has qualified for an ADF aircraft trade whilst serving in the ADF.

- 1.5.13 **Flight Line Egress System Safing Devices.** Flight-line egress system safing devices are devices fitted to aircrew egress systems to prevent inadvertent operation of a system or system component while an aircraft is on a flight-line or in minor maintenance.
- 1.5.14 **Flight/Operational Servicing.** Flight/Operational servicings comprise those servicings performed immediately before or after use, or between successive uses of an aircraft or equipment either to make it ready for use or restore it to a condition suitable for use. Flight/Operational servicings are operational maintenance tasks and include:
- Before Flight/Use Servicings (BF);
 - Turnaround/Shift Change Servicings (TA); and
 - After Flight/Use Servicings (AF).
- 1.5.15 **Foreign Object Control Check.** A Foreign Object Control (FOC) Check is an inspection for foreign objects on completion of all maintenance in a prescribed area that is either to be hidden from view or is to be immediately covered. The check includes the closure of panels, where applicable.
- 1.5.16 **Inspection.** Inspection is the process of determining compliance with maintenance standards. Inspections can be classified as follows:
- Progressive Inspections.** Progressive inspections are those inspections, completed by a Maintenance Quality Inspector (MQI), which are performed during the progress of maintenance, manufacture or installation to ensure the integrity of the work performed.
 - Independent Inspections.** Independent inspections are inspections of nominated maintenance tasks (normally Critical Maintenance Operations) by an MQI who neither performed nor progressively inspected the maintenance task. The purpose of independent inspections is to ensure:
 - quality of workmanship,
 - integrity of equipment, and
 - the detection and correction of errors.
- 1.5.17 **Licensed Aircraft Maintenance Engineer (LAME).** A person who, after meeting the requirements of the Civil Aviation Regulations, is granted a licence by CASA to supervise and certify the maintenance of Australian registered aircraft.
- 1.5.18 **Maintenance Certification.** The three levels of maintenance certification applicable to ADF aircraft and aircraft equipment are:
- First Level Certification - tradesperson;
 - Second Level Certification - MQI (progressive/mandatory inspection); and
 - Third Level Certification - MQI (independent/final inspection).
- 1.5.19 **Maintenance Documents.** Maintenance documents are all publications and documents referred to by aircraft tradespersons when performing maintenance. In the ADF maintenance environment they include, but are not restricted to: Standing Instructions, Flight Procedures, Bench Level Instructions, Defence Instructions (General) Logistics, Defence Instructions (Air Force) Logistics, Electrical and Mechanical Engineering Instructions (EMEIs) (Army), Naval Aviation Publications (NAP), Naval Aircraft Maintenance Instructions (NAMI), Defence Instructions (Air Force) Australian Air Publications (particularly Technical Maintenance Plans, Servicing Schedules, e.g. AAP-6), documents in the EE500 and similar series, Special Technical Instructions (STIs), Modification Orders, specifications and worksheets.

- 1.5.20 **Maintenance Egress System Safing Devices.** Maintenance egress system safing devices may be additional to, or may replace, flight-line egress safing devices, and are fitted to prevent inadvertent operation of a system or system component while an aircraft is undergoing deeper levels of maintenance.
- 1.5.21 **Maintenance Management Plan.** The Maintenance Management Plan (MMP) documents a maintenance organisation's Maintenance Management System (MMS), that is, the organisational structure, key appointments and signatories, responsibilities, procedures and resources that an organisation applies to its conduct and management of maintenance to meet ADF requirements.
- 1.5.22 **Maintenance Quality Inspector (MQI).** An aircraft tradesperson or LAME assessed as competent to perform second and third level maintenance certification of maintenance tasks for which they are authorised.
- 1.5.23 **Maintenance Task.** Any action or actions required to preclude the occurrence of a malfunction or restore an equipment to a serviceable condition. The following are representative types of maintenance tasks:
- a. Inspection;
 - b. Cleaning, lubricating, and corrosion prevention;
 - c. Testing, troubleshooting, and isolating;
 - d. Calibration;
 - e. Repair;
 - f. Removal and installation;
 - g. Modification;
 - h. Adjustment;
 - i. Disassembling and assembling; and
 - j. Replenishment.
- 1.5.24 **Non-Tradesperson.** A person who is employed in a maintenance area and has no recognised aircraft trade qualifications.
- 1.5.25 **Off-Aircraft Maintenance.** Off-aircraft maintenance, or workshop maintenance, are those maintenance tasks that are not, or cannot, be effectively accomplished on or at the aircraft (except for items removed for convenience for bench check and/or repair), and require the removal of the component to a workshop or repair facility.
- 1.5.26 **On-Aircraft Maintenance.** Those maintenance tasks that are, or can be, accomplished effectively on, or at, the aircraft.
- 1.5.27 **Operational Maintenance (OM).** OM includes tasks related to the preparation of equipment for immediate use, and recovery and minor repair of the equipment after use. OM tasks require a limited range of support equipment and may involve the limited use of workshop facilities

- 1.5.28 **Oxygen Systems.** Hardware permanently or temporarily fitted to aircraft and hypobaric chambers to provide occupants with supplemental oxygen to counter the effects of reduced ambient oxygen concentrations at altitude, to provide clean breathing gas in the event of smoke/fumes in the cockpit/cabin, and in some cases to provide enhanced gravitational force protection. This equipment includes that intended for emergency only flight, or post ejection conditions. Aviator's Dry Breathing Oxygen (gaseous and liquid) is included in the definition.
- 1.5.29 **RAAF.** Royal Australian Air Force.
- 1.5.30 **RAN.** Royal Australian Navy
- 1.5.31 **Rescue Crewmembers.** Rescue crewmembers are members of emergency rescue teams, and fire and ambulance crews who are required to work on, or in the vicinity of, aircrew egress systems during an emergency.
- 1.5.32 **Routine Servicing.** Routine Servicing (denoted R_n, where n = 1, 2, 3 etc) are a set of tasks defined for an aircraft which are necessary to maintain its inherent levels of safety and reliability. Additionally, some leased aircraft operated by the ADF may be subject to servicing defined by civilian documentation. These servicings perform the same function as Routine Servicings however they are generally denoted using alpha codes (A, B and C Inspections). The set of tasks may include preventative maintenance, surveillance maintenance and functional tests and be performed by one or more trades. R servicings, or the civilian equivalents for leased aircraft, are performed at fixed intervals and are numbered sequentially for each application and normally go from minor servicings (R1/A) to major servicings (R5/E). The extent of the servicing is detailed in the applicable aircraft technical maintenance plans or civil system of maintenance.
- 1.5.33 **Senior Maintenance Manager.** The Senior Maintenance Manager (SMM) is the senior appointment with direct technical responsibility for all maintenance functions performed within the maintenance organisation.
- 1.5.34 **Self Certifying Maintenance (SCM).** SCM allows authorised MQIs to certify for the first and second levels of certification on a single maintenance task performed personally. SCM applies to both on-aircraft and off-aircraft maintenance.
- 1.5.35 **Supervision.** Supervision is the control exercised by one individual over the work of others. This control includes the authority to guide and direct others. Supervision can be classified as follows:
- a. **Normal Supervision.** Supervision of maintenance tasks where personnel carrying out the maintenance tasks remain responsible for the correctness and quality of the tasks performed by them.
 - b. **Direct Supervision.** Denotes a higher degree of control in which the supervisor assumes total responsibility for the correctness and quality of any specific tasks performed by personnel under direct supervision.
- 1.5.36 **Trade Supervision.** Trade supervision involves the performance of specific inspections (Progressive/Mandatory) applicable to a maintenance activity and the supervision of tradespersons in the performance of that maintenance activity.

- 1.5.37 **Technical Sponsor.** The Technical Sponsor for the maintenance of ADF aircraft, equipment and systems is the Director of Aircraft Maintenance (DAIRMAINT) within the Directorate General of Technical Airworthiness (DGTA). The Technical Sponsor will act as the point of contact for all requests for approval of either generic or specialist training to be provided by the civilian contractor. The Technical Sponsor will liaise with the relevant Technology Managers prior to approving any contractor developed training package.

Note:

ADF - Civilian Trade Cross Reference. A comprehensive table detailing the ADF to Civilian Aerospace Trades/Employment profiles is contained in Annex D.

RAN SPECIFIC DEFINITIONS

- 1.5.38 **Final Inspections.** Compulsory inspections carried out on completion of work on flight critical systems to verify the integrity of that system.
- 1.5.39 **Mandatory Inspections.** Prescribed compulsory inspections used to check that defined standards are met during certain maintenance.

SECTION 2

ON-AIRCRAFT MAINTENANCE

MAINTENANCE REQUIREMENTS

2.1 Only AMEs and appropriately qualified ex-ADF aircraft tradespersons shall carry out maintenance tasks on aircraft in the trade classification for which they are qualified, unless authorised in accordance with Sections 7 and 8. Aircraft tradespersons employment conditions are as follows:

2.1.1 **Tradesperson Tasks.** The tradesperson carrying out the maintenance action is to sign as the tradesperson certifying that he/she has performed the action in accordance with approved procedures. Except as specified in paragraph 2.3 for personnel under training, apprentices that have been assessed as competent in a particular task can be authorised to certify tradesperson maintenance documentation for the particular task undertaken.

2.1.2 **Tradesperson Minimum Experience/Currency Requirements.** Tradespersons shall have at least *three* months experience in the last 18 months on the aircraft type for which they are authorised. Where a maintenance organisation has not previously been involved with the aircraft type, a phase-in plan shall be proposed by the maintenance organisation for approval by the ADF. Where a maintenance organisation is required to carry out specific maintenance tasks on a number of aircraft types, such as a common role modification, and the minimum experience/currency requirements cannot be met, the maintenance organisation is to submit an employment profile for each tradesperson to be employed on the task. The profile will detail each tradesperson's qualifications and experience. Under these circumstances, employment of a particular individual on the task will be subject to approval by the ADF.

2.2 **Non-Tradespersons.** Specific instances where persons, other than qualified aircraft tradespersons, may carry out tasks of a routine nature are specified in Section 7.

TRAINING AND AUTHORISATION

2.3 Persons qualified to certify maintenance in accordance with sub-section 2.1, shall have completed the safety and familiarisation courses and if required, the relevant ADF or ADF approved or Original Equipment Manufacturer (OEM) off-the-job training as specified in the Statement of Requirement (SOR) or MMP. The performance of maintenance by personnel under training (leading to task authorisation) shall be directly supervised. Personnel who are under training for a specific maintenance task may carry out the maintenance action and certify the completion of the maintenance action as the tradesperson signatory, providing that the maintenance has been performed under direct supervision and mandatory off-the-job training requirements have been met. In such circumstances, the task supervisor shall be responsible for the correct performance of the task. Both off-the-job and on-the-job training must have been successfully completed and the individual assessed as competent before the tradesperson can be authorised by the SMM, or delegate, to perform and certify maintenance without being directly supervised. Annex C specifies mandatory formal off-the-job training that must be completed prior to any maintenance actions on the specialist equipment listed. To attain this mandatory requirement where the maintenance organisation has not previously been involved with the aircraft type, a phase-in plan detailing the number of already trained personnel and the time frame to complete the training shall be proposed by the maintenance organisation for approval by the ADF.

2.4 Where an ADF Enterprise Specific Competency Standard exists, any tradesperson employed in maintenance activities which are applicable to the enterprise standard must have been assessed as competent in the standard prior to task authorisation. Enterprise specific standards are listed in the applicable Occupational Specification.

SECTION 3

AIRCREW EGRESS SYSTEMS MAINTENANCE

3.1 Aircrew egress systems, either in the form of ejection seats or ejection crew modules, are a source of potential danger during aircraft ground operations. To minimise the hazards inherent in such systems, safety devices must be fitted to egress systems while aircraft are inoperative and/or undergoing maintenance. Consequently, only persons who have successfully completed the following ADF training requirements in aircrew egress systems, and have been assessed as competent, shall be authorised to carry out the associated maintenance tasks.

3.1.1 **Entry to Crew Positions.** Only personnel who have successfully completed the approved ADF familiarisation training course in aircrew egress systems, and related safety precautions, are permitted to enter the crew position of aircraft fitted with aircrew egress systems. In an emergency, rescue crewmembers may enter the crew positions of aircraft fitted with aircrew egress systems.

3.1.2 **Installation and Removal of Flight Line Egress System Safing Devices.** Only personnel who have undergone training as specified in paragraph 2.3, and aircrew members, are to fit and remove flight-line egress system safing devices. In an emergency, rescue crewmembers may fit these safing devices.

3.1.3 **Installation and Removal of Maintenance Egress System Safing Devices.** Only ADF egress trained tradespersons, AMEs or AMs who have successfully completed ADF or ADF approved or Original Equipment Manufacturer (OEM) training on fitment and removal of ejection seats are to fit or remove maintenance egress system safing devices.

3.1.4 **Removal, Handling and Fitment of Aircrew Egress Systems and Components.** Only ADF egress trained tradespersons, AMEs or AMs who have successfully completed ADF, ADF approved or OEM training on fitment and removal of egress items and who have been assessed as competent by the SMM, are to remove, handle and refit aircrew egress systems and components. This training is to include compliance with DI(AF) AAP 7039.001-1 Explosives Regulations, in particular EO licensing, EO packaging and lot number identification. These tradespersons shall have at least *three* months experience in the last 12 months on the aircraft type for which they are authorised. To attain this requirement where the maintenance organisation has not previously been involved with the aircraft type, a phase-in plan shall be proposed by the maintenance organisation for approval by the ADF.

Annual Re-certification.

3.2 Personnel involved in work on, or in the vicinity of, aircrew egress systems are to be tested at least annually at ADF approved training establishments for their understanding of safety precautions, their ability to determine if safety devices are correctly or incorrectly fitted, and their proficiency in fitting flight-line and maintenance (as appropriate) egress system safing devices. Personnel must successfully complete this testing to continue to work with, or in the vicinity of, aircrew egress systems.

SECTION 4

OFF-AIRCRAFT MAINTENANCE

MAINTENANCE REQUIREMENTS

4.1 Only AMs, AMEs with appropriate AM competencies and ex-ADF aircraft tradespersons shall carry out maintenance tasks on aircraft equipment in the aerospace trade classification for which they are qualified, unless authorised in accordance with Sections 7 and 8. Aircraft tradespersons employment conditions are as follows:

4.1.1 **Tradesperson Tasks.** The tradesperson carrying out the maintenance action is to sign as the tradesperson signatory certifying that he/she performed the maintenance action in accordance with approved procedures. Except as specified in paragraph 4.3 for personnel under training, apprentices that have been assessed as competent in a particular task can be authorised to certify tradesperson maintenance documentation for the particular task undertaken.

4.2 **Non-Tradespersons.** Specific instances where persons, other than an aircraft tradesperson, may carry out tasks of a routine nature are specified in Section 7.

TRAINING AND AUTHORISATION

4.3 Persons qualified to certify maintenance in accordance with sub-section 4.1, shall have completed the safety and familiarisation courses and if required, the relevant ADF or ADF approved or OEM off-the-job training as specified in the SOR or MMP. The performance of maintenance by personnel under training (leading to task authorisation) shall be directly supervised. Personnel who are under training for a specific maintenance task may carry out the maintenance action and certify the completion of the maintenance action as the tradesperson signatory, providing that the maintenance has been performed under direct supervision and mandatory off-the-job training requirements have been met. In such circumstances, the task supervisor shall be responsible for the correct performance of the task. Both off-the-job and on-the-job training must have been successfully completed and the individual assessed as competent before the tradesperson can be authorised by the SMM, or delegate, to perform and certify maintenance without being directly supervised. Annex C specifies mandatory formal off-the-job training that must be completed prior to any maintenance actions on the specialist equipment listed. Courses for specific equipment, such as hydraulic rigs and Automatic Test Equipment (ATE), and skills such as high reliability soldering, will apply for specialised maintenance tasks, and will be specified on a case-by-case basis in the contract or Statement of Work. To attain this requirement where the maintenance organisation has not previously been involved with the aircraft equipment type, a phase-in plan shall be proposed by the maintenance organisation, for approval by the ADF.

4.4 Where an ADF Enterprise Specific Competency Standard exists, any tradesperson employed in maintenance activities which are applicable to the enterprise standard must have been assessed as competent in the standard prior to task authorisation. Enterprise specific standards are listed in the applicable Occupational Specification.

SECTION 5

NON-DESTRUCTIVE TESTING, MANUAL WELDING, LIFE SUPPORT EQUIPMENT, AIRCRAFT STRUCTURES, AIRCRAFT SURFACE FINISHING, ELECTROPLATING and METAL MACHINING

5.1 Non-Destructive Testing. Non-destructive testing (NDT) shall only be carried out on ADF aircraft and equipment by NDT technicians qualified to AS3669 'Non-Destructive Testing Qualification and Registration of Personnel - Aerospace' or equivalent ANZES qualification. NDT shall only be carried out in the techniques for which the technician is authorised. NDT certification requirements are specified in paragraph 6.11. Regardless of the qualification system used, NDT technicians shall be re-certified annually in accordance with the approved standard, amplified by the following requirements:

- a. Level 2 technicians shall be assessed based upon performance observation by a Level 3 technician or by an examination prepared, conducted and graded by a Level 3 technician, in accordance with AS3669 or equivalent ANZES standard.
- b. The results of all re-certification assessments are to be recorded in the maintenance organisations Quality documentation, and certified by the assessing technician.

5.2 Manual Welding. Manual welding of ADF aircraft and equipment shall only be carried out by persons qualified in accordance with CASA CAAP 33-1 (0) Aircraft Manual Welding, Approvals and Qualifications and Attachment Syllabus Publication CAR29A. Manual welding inspection requirements are specified in paragraph 6.12.

5.3 Aircraft Life Support Equipment. Maintenance of ADF Aircraft LSE, with the exception of oxygen systems maintenance, shall only be carried out by persons who have successfully completed the RAAF Aircraft Life Support Fitter Course, or an equivalent course. Equivalent courses must be approved by the Technical Sponsor for Aircraft LSE and delivered by a Registered Training Organisation or an organisation approved by RAAF Headquarters Training Command. Specific LS equipment or aircraft type courses shall be specified, or directly referenced, in the organisations MMP. Personnel employed to perform oxygen systems maintenance are to satisfy the mandatory formal training requirements specified in annex C to this standard.

5.4 Liquid Dry Breathing Oxygen (LDBO) Quality Control. The LDBO Quality Control function shall only be carried out by personnel who have completed the RAAF LDBO Quality Assurance Course (or civilian equivalent as approved by the Technical Sponsor for Oxygen Systems).

5.5 Aircraft Structures. Structural maintenance, with the exception of manual welding, of ADF aircraft shall only be carried out by an AME-Structures or an ex-ADF Aircraft Structural Fitter unless authorised in accordance with Sections 7 and 8. Only AME-Structures or an ex-ADF Advanced Aircraft Structural Fitter certified as having met the requirements of RAAF Standard Engineering C5033 will carry out adhesive bonded repairs.

5.6 Aircraft Surface Finishing. Surface finishing of ADF aircraft and equipment shall only be carried out by ex-ADF Aircraft Surface Finishers, or by qualified automotive refinishers who have successfully completed in-house training to upgrade their competency to aircraft surface finisher standard, or by personnel authorised in accordance with the provisions of Section 8. The proposed in-house training shall be approved by the Technical Sponsor for aircraft surface finishing. Aircraft paint stripping shall be carried out under the supervision of an Airframe or Mechanical AME, LAME, or an ex-ADF Aircraft Surface Finisher. Component stripping and refinishing operations, other than aircraft flight controls or removable panels, may be carried out by a non-tradesperson in accordance with Section 7.

5.7 Electroplating. Electroplating processes shall only be undertaken by tradespersons qualified to the applicable Metal and Engineering Industry National Competency Standards or equivalent. The required standards are to be determined and listed in the MMP. Personnel involved in electro-deposition of inorganic coatings by brush plating methods shall be certified, and requalified annually, in accordance with MIL-STD-865.

5.8 Metal Machining. Metal Machining shall only be carried out by tradespersons qualified to the applicable Metal and Engineering Industry National Competency Standards. The required standards are to be determined and listed in the MMP.

SECTION 6

MAINTENANCE CERTIFICATION AND INSPECTION REQUIREMENTS

MAINTENANCE CERTIFICATION REQUIREMENTS

6.1 Certification of aircraft maintenance documentation shall only be performed by authorised tradespersons subject to the criteria specified in this Section. Where other than ADF maintenance documentation is used, provision for the following certification requirements shall be included in the documentation.

6.1.1 **First Level Maintenance Certification.** First level maintenance certification is the tradesperson's signature to indicate completion of a task or part task. A tradesperson shall only certify in this capacity for tasks that they have been assessed as competent and authorised to carry out.

6.1.2 **Second Level Maintenance Certification.** Second level maintenance certification (Trade Supervisor / Mandatory Inspection) is required whenever nominated maintenance tasks are performed. The purpose of this certification is to confirm that the task has been completed in accordance with the approved maintenance documentation. Second level maintenance certification will be prescribed at appropriate points in maintenance documentation and is normally required when:

- a. accessories or components are being:
 - (1) located in a specific position by means of any locating device,
 - (2) secured by any locking device, or
 - (3) replaced and reconnected;
- b. compartments in the aircraft structure are about to be hidden from view or sealed off by means of a cover, panel or by other equipment;
- c. functional checks are being performed;
- d. tradespersons are receiving further training;
- e. new procedures are being implemented; or
- f. nominated by the MQI.

6.1.3 **Third Level Maintenance Certification.** Third level maintenance certification (Independent / Final inspections) shall be performed when:

- a. flight critical maintenance operations are completed; or
- b. nominated by the MQI (e.g. MQIs may nominate random inspection of some maintenance operations, or inspection of components after fitment, depending upon their assessment of requirements).

6.1.4 Critical Maintenance Operation (CMO). When performing third level certification, an inspector is to ensure that:

- a. those parts of controls, associated systems and equipment which were subject to maintenance are correctly assembled, adjusted and locked; and
- b. all controls, associated systems and equipment which were subject to maintenance, or which may have been affected by the maintenance operation, operate with full and free movement in the correct sense and in accordance with prescribed limits.

6.2 Maintenance Quality Inspector (MQI). An MQI is a tradesperson who has been assessed as competent in accordance with paragraphs 6.4, 6.5 and 6.6 to perform second and third level maintenance certification of maintenance tasks for which they are authorised.

6.2.1 Tradespersons authorised to perform maintenance quality inspections may only certify for either **second** or **third** levels certification, not both on the same task.

6.3 Self Certifying Maintenance (SCM). At the discretion of the SMM an MQI authorisation may be extended to permit a member to carry out the task (**first level certification**) and quality inspection (**second level certification**) on a single task performed personally. This specific authorisation is termed Self Certifying Maintenance (SCM).

SELECTION AND APPOINTMENT OF MAINTENANCE QUALITY INSPECTORS

6.4 An MQI shall only be appointed and authorised by the SMM. The SMM is responsible for ensuring that a tradesperson so authorised has been assessed to determine their competence to perform maintenance inspections at the appropriate level. The assessment is to be carried out by the SMM, using criteria and a process detailed in the organisation's approved MMP or Quality documentation. Assessment may be via interview, examination, observation or a combination of these methods. However, the selection process and outcome must be formally recorded for each level of authorisation and will be subject to ADF audit.

6.5 To be eligible for consideration as an MQI, the tradesperson must meet the following criteria:

- a. **for on-aircraft maintenance**, have at least *five* years experience in an aircraft trade group, which may include apprenticeship, in the aircraft industry with at least *one* years experience as a fully qualified Certificate 4 level AME (or ADF Trade qualified); or
- b. **for off-aircraft maintenance**, be qualified as a Certificate 4 level AM (or ADF Trade qualified), or AME with appropriate AM competencies, with at least *five* years experience in an aircraft trade classification, which may include apprenticeship, in the aircraft industry.
- c. for LAMEs who have not completed an approved aerospace apprenticeship:
 - (1) have one year of experience as a LAME, and have completed the CASA 'basics' for the particular aircraft type as detailed at Annex A; or
 - (2) have, as a minimum, the time specified at Annex B on the aircraft type for which on-aircraft certification authorisation is sought.
- d. have successfully completed specialist ADF or ADF approved or OEM training courses for the applicable aircraft type, or equipment; and

- e. have at least *three* months experience in the last 18 months on the aircraft type or equipment for which they are being authorised (with the exception of egress systems for which the requirements of paragraph 3.1.4 will apply).

6.6 In addition, during the SMM's assessment leading to authorisation the following aspects of the proposed tradesperson's professional abilities are to be assessed:

- a. the tradesperson's technical experience to ensure that the tradesperson has sufficient experience on the aircraft, system, or equipment type for which the authority is sought; and
- b. the tradesperson's knowledge of the MMP, technical administration documentation, defect reporting and investigation, maintenance supervision/inspection requirements and occupational health and safety.

Selection and Appointment of Tradespersons Authorised to Perform SCM

6.7 Personnel appointed to perform SCM must have previously been authorised to perform the task as the maintainer/tradesperson and MQI. In addition to the requirements of paragraphs 6.4, 6.5 and 6.6, assessment of an MQI's personal attributes, particularly professional judgment of airworthiness implications and attention to detail (noting the need for extra vigilance and caution against operating under stressful conditions), must be carried out to ensure their fitness to perform and complete an SCM task.

6.8 **Authorisation/Reauthorisation of MQI/SCM.** Tradespersons authorised to perform MQI/SCM shall be reassessed every **twelve months** via the authorisation process detailed in the organisation's MMP.

6.9 Where, during a phase-in period a maintenance organisation cannot initially meet the currency requirements of paragraph 6.5, a phase-in plan shall be formulated by the maintenance organisation for approval by the ADF Technical Airworthiness Authority, or delegate.

APPLICATION OF INSPECTION

6.10 Tradespersons/Maintenance Quality Inspector may work in different capacities throughout the day. However, the following conditions apply:

- a. Tradespersons authorised to perform SCM who have personally performed a maintenance task may certify the applicable maintenance document as both the tradesperson/maintainer (first level) and maintenance quality inspector (second level).
- b. For any one maintenance task, personnel, other than tradespersons authorised to perform SCM, shall not certify a maintenance document in any more than one of the following capacities:
 - (1) tradesperson/maintainer (first level),
 - (2) maintenance quality inspector (second level), or
 - (3) maintenance quality inspector (third level).

6.11 **Non-Destructive Testing.** Second and third level certification is not required unless detailed specifically in the maintenance documentation prescribing the requirements for the particular NDT task.

6.12 Manual Welding. Second and third level certification is not required unless detailed specifically in the maintenance documentation prescribing the requirements for the particular welding task.

SECTION 7

EMPLOYMENT OF NON-TRADESPERSONS IN MAINTENANCE AREAS

7.1 A restricted range of technical equipment maintenance tasks (on-aircraft and off-aircraft) may be performed and/or supervised by appropriately trained and authorised non-tradespersons.

7.2 **Maintenance Tasks.** Generic maintenance tasks which may be performed by non-tradespersons are those which do not require the full training, skill or knowledge of an aircraft tradesperson. All non-tradesperson tasks are to specified or directly referenced in the MMP.

7.3 **Training and Competency.** In addition to completing relevant training, selected non-tradespersons are to demonstrate task competency through practical task assessment. Individuals who have not demonstrated, or been given the opportunity to demonstrate, competency within 12 months of completing off job training are not to be given further consideration for performing the maintenance task until they undergo further training in accordance with the identified training requirement.

7.4 **Authorisation and Currency.** Following satisfactory demonstration of competency, non-tradespersons may be authorised to perform selected maintenance tasks. Currency of this authorisation is to be a maximum of 12 months. Reassessment of competency should be carried out prior to expiry of the authorisation to perform a maintenance task.

7.5 **Promulgation of Training and Currency Requirements.** The SMM is responsible for ensuring that all mandatory training, currency and competency assessment requirements relevant to the authorisation of non-tradespersons are promulgated or directly referenced in the MMP.

SUPERVISION REQUIREMENTS

7.6 Supervision of some maintenance tasks may be performed by non-tradespersons who are appropriately authorised. Supervision by non-tradespersons is normally restricted to general oversight of task performance. Non-tradespersons are not to perform maintenance quality inspections on aircraft or aircraft systems (on-aircraft maintenance). However, non-tradespersons may be authorised to perform maintenance quality inspections on aircraft components (off-aircraft maintenance), provided that they have completed competency assessment in the relevant Aeroskills Training Package competency standard and can satisfy the experience criteria outlined in Section 6 of this standard.

7.7 Authorisation is to be limited to supervision of selected maintenance tasks which the individual is currently authorised to perform. Under no circumstances are non-tradespersons to be authorised to:

- a. conduct supervision of personnel undergoing competency assessment leading to task authorisation or re-authorisation; and
- b. act as a tradesperson performing SCM.

SECTION 8

EMPLOYMENT OF CROSS-TRADE TRADESPERSONS

8.1 The productivity of aircraft maintenance organisations can be increased by employing cross-trade tradespersons to perform some maintenance tasks not requiring the levels of skill or knowledge of a fully qualified tradesperson in the associated 'generic' or base trade. Accordingly, a restricted range of technical equipment maintenance tasks (on-aircraft and off-aircraft) may be performed and/or supervised by appropriately trained and authorised cross-trade tradespersons.

8.2 **Maintenance Tasks.** Maintenance tasks which may be authorised by the SMM to be performed by cross-trade tradespersons will be identified in the MMP, or equivalent document. Suitable tasks are those which do not require the levels of skill or knowledge of the associated base trade tradesperson. These tasks may include, but are not restricted to, flight servicing, elements of minor routine servicing and basic removal and installation tasks.

8.3 **Training and Competency.** The SMM is responsible for identifying all formal training and on-the-job training required as a pre-requisite for authorising individual cross-trade tradespersons to perform maintenance tasks. In addition to completing relevant training, selected cross-trade tradespersons are to demonstrate task competency, as required by the approved MMP, to the satisfaction of the SMM, or delegate, through practical task assessment, before being authorised to perform selected maintenance tasks. Individuals who have not demonstrated, or been given the opportunity to demonstrate, competency within 12 months of completion of training, are not to be given further consideration for performing the maintenance task until they undergo further training in accordance with the SMM-identified training requirement.

8.4 **Authorisation and Currency.** Following satisfactory demonstration of competency, the SMM shall authorise cross-trade tradespersons to perform the selected maintenance tasks. Currency of this authorisation is to be to a maximum of 12 months. Reassessment of competency is to be carried out prior to expiry of the authorisation to perform a maintenance task.

8.5 **Promulgation of Training and Currency Requirements.** The SMM is responsible for ensuring that all mandatory training, currency and competency assessment requirements relevant to the authorisation of cross-trade tradespersons are promulgated in the MMP.

SUPERVISION REQUIREMENTS

8.6 **Supervision of Maintenance Tasks by Cross-trade Tradespersons.** Cross-trade tradespersons may be authorised to supervise the performance of maintenance tasks by other personnel (aircraft tradespersons) subject to the following conditions:

- a. Authorisation is to be limited to supervision of selected maintenance tasks which the individual is currently authorised to perform. Under no circumstances are cross-trade tradespersons to be authorised to:
 - (1) conduct supervision of personnel under training or competency assessment leading to task authorisation or re-authorisation; or
 - (2) supervise a maintenance task which is being performed by another cross-trade tradesperson or a non-tradesperson.
- b. Independent Inspectors may be authorised to perform a limited range of cross-trade inspection tasks on CMOs. Suitable tasks are to be identified by the SMM and listed in the maintenance organisation's MMP.
- c. The cross-trade tradesperson must meet the requirements of paragraph 6.2.
- d. Authorisation as a supervisor is to be subject to the same currency and competency assessment requirements described in paragraphs 8.3 and 8.4.

ANNEX A TO RAAF SE T5022

CASA EXAMINATION CODES/COURSE EQUIVALENTS BY AIRCRAFT TYPES FOR ON-AIRCRAFT LAME MQI

Examinations applicable to all aircraft (1)

Airframe	BA, BB, BC, FA, FF, FG.
Engines	BA, BB, BC.
Radio	QA, QB, QC, QD, QE, WA1, WA2, WB, WC, WG.
Electrical	QA, QB, QC, QD, QE, EB.
Instrument	QA, QB, QC, QD, QE, IA, IZ, IJ.

Additional Exam Requirements Applicable to Aircraft Types

Aircraft Type	Airframe	Engine (2)	Electrical	Instrument	Radio
F/RF-111C	FM, IM	GG, GH	ED	IF, IK, IM	WD, WE, WF, WI, WJ
F/A-18	FM, IM	GG, GH	ED	IF, IK, IM	WD, WE, WF, WI
P3 Orion	FM, IM	GC, GG, GH	ED	IF, IK, IM	WD, WE, WF, WI, WJ, WK
C130 Hercules	FM, IM	GC, GG, GH	ED	IF, IK, IM	WD, WE, WF, WH, WI, WJ, WK
B707	FM, IM	GG, GH	ED	IF, IK, IM	WD, WE, WF, WI, WJ
Falcon 900	FM, IM	GG, GH	ED	IF, IK, IM	WD, WE, WF, WI, WJ
HS748	FM, IM	GC, GG, GH	ED	IF, IK, IM	WD, WE, WF, WI, WJ, WK
Caribou		GA, GB, GC, GD, GF	ED		WD, WE, WH, WJ
Dakota		GA, GB, GC, GD, GF	ED		WD, WE, WJ
Macchi	FM	GC, GH		IM	WD, WJ
PC9	FM	GC, GG, GH			WD, WJ
Blackhawk	FI, FR	GG, GH	ED	IH	WI, WJ, WK
Iroquois	FI, FR	GG, GH			WI, WK
AS 350B Squirrel	FI, FR	GG, GH		IH	WI, WJ, WK
Kiowa	FI, FR	GG, GH			WI,
Chinook	FI, FR	GG, GH	ED	IH	WI, WJ, WK
Seahawk	FI, FR	GG, GH	ED	IH	WI, WJ, WK
Seaking	FI, FR	GG, GH	ED	IH	WI, WJ, WK

Notes:

- Exam codes are in accordance with CASA Airworthiness Advisory Circular Part 9. CASA credits gained under superseded exam codes are acceptable where equivalence can be shown.
- Type examinations for civilian equivalents, as per paragraph 6.5.c., where applicable.

**ANNEX B TO
RAAF SE T5022**

**AIRCRAFT TYPES
ON-AIRCRAFT LAME MQI QUALIFYING TIMES (1)**

Aircraft Type	Qualifying Time (Aircraft trades) Months	Qualifying Times (Avionics trades) Months
F/RF-111C	12	12
F/A-18	9	9
P3 Orion	9	12
C130 Hercules	6	6
B707	6	6
Falcon 900	6	6
HS-748	6	6
Caribou	6	6
Dakota	3	3
Macchi	3	3
PC-9/A	3	3
Black Hawk	N/A	N/A
Iroquois	N/A	N/A
Squirrel	N/A	N/A
Kiowa	N/A	N/A
Chinook	N/A	N/A
Seahawk	N/A	N/A
Seaking	N/A	N/A

Note:

1. Qualifying times listed are in addition to time spent completing field training courses.

ANNEX C TO RAAF SE T5022

MANDATORY FORMAL OFF-THE-JOB TRAINING REQUIREMENTS FOR TECHNICAL MAINTENANCE ACTIVITIES

1. These requirements are specified in order to ensure that personnel performing maintenance of technical equipment maintain appropriate standards for occupational health and safety and have, as a minimum, the training required to perform specified maintenance functions to an acceptable standard. Contractors may specify additional mandatory formal training requirements in order to prepare personnel for aircraft type specific safety and maintenance requirements, or in order to improve productivity within the local work area.

MANDATORY FORMAL TRAINING REQUIREMENTS

2. The following sub-paragraphs outline mandatory formal training requirements for specific maintenance activities.

- a. **Explosive Ordnance.** For Explosive Ordnance (EO) and related aircraft maintenance, other than egress system maintenance and safety and distress pyrotechnics inspection and handling, completion of an approved Explosive Ordnance Course is required before subsequent Weapon System specific EO training.
- b. **Egress Systems.** Refer to Section 3 for egress system maintenance requirements.
- c. **Safety, Survival and Distress Pyrotechnics.** Safety, survival and distress pyrotechnics inspection and handling requires completion of the RAAF School of Technical Training Aircraft Life Support Fitter Safety and Survival Distress Pyrotechnics Course, or an equivalent course as approved by the ADF Technical Sponsor for Aircraft LSE.
- d. **Oxygen System Replenishment.** Oxygen system replenishment requires completion of the oxygen system replenishment phase of the ADF Aircraft or Avionics Mechanic course (or National Aerospace Curriculum Module NAC05) or equivalent as approved by the ADF Technical Sponsor for Oxygen Systems.
- e. **Aircraft Oxygen Systems and Oxygen Ground Support Equipment.** Maintenance and inspection of aircraft oxygen systems and oxygen ground support equipment, other than component removal and installation, requires completion of the ADF Avionics Fitter Course (or National Aerospace Curriculum Modules NAC05 and NAA17) or equivalent as approved by the ADF Technical Sponsor for Oxygen Systems.
- f. **Oxygen System Component Removal and Installation.** Oxygen system component removal and installation requires completion of the oxygen system replenishment phase of the ADF Aircraft or Avionics Mechanics course (or National Aerospace Curriculum Module NAC05) or equivalent training as approved by the ADF Technical Sponsor for Oxygen Systems.
- g. **Adhesive Bonding.** Adhesive bonded repairs to aircraft structures and components requires successful completion of the RAAF Adhesive Bonding Structure Technique course, or equivalent training as approved by the ADF Technical Sponsor for Adhesive Bonding.
- h. **Ground Running of Military Aircraft Engines.** Ground running of installed and uninstalled military aircraft engines requires completion of the ADF aircraft type specialist Engine Ground Runners course or equivalent as approved by the ADF Technical Sponsor for Military Aircraft Engines. Additionally, personnel authorised to ground run installed and uninstalled military aircraft engines must be reassessed annually.

- g. **Ground Running of Installed Rotary Wing Aircraft Engines.** Maintenance personnel shall only ground run rotary wing engines with the rotors disengaged. Only personnel who are qualified pilots on the applicable aircraft type shall ground run rotary wing engines with rotors engaged.

**ANNEX D TO
RAAF SE T5022**

**ADF - CIVILIAN TRADES/EMPLOYMENT PROFILES
CROSS REFERENCE**

ADF Trade Group and Skill Levels (All Trade Group/Skill Levels Applicable to Air Force)	Civilian Trade Group	Maintenance Type		
		On-Aircraft	Off-Aircraft	
		OM	DM	(Workshop) DM
Aircraft	Mechanical-AME			
Mechanic/Fitter 1	Apprentice 1-2 yr	X	X(1)	
Fitter 2	Apprentice 3 yr	X	X	
Technician 1 (Army)	AME	X	X	X
Technician 1 (AM Competencies)(Army)	AM			X
Technician 2 (SST) ATA (AB QM3) (Navy)	AME/LAME (2)	X	X	
Advanced Technician (NDI)	AME/AM (NDT Auth.)		X	X
Avionics	Avionics-AME			
Mechanic/Fitter 1	Apprentice 1-2 yr	X	X(1)	
Fitter 2	Apprentice 3 yr	X	X	
Technician 1 (Army)	AME	X	X	X
Technician 1 (AM Competencies) (Army)	AM			X
Technician 2 (SST) ATV (AB QM3) (Navy)	AME/LAME (2)	X	X	
Advanced Technician	AM (3)			X
Aircraft Structures	Structures-AME			
Fitter 1/2	Apprentice 2-3 yr (4)	X	X	
Advanced Fitter (Structures) (Army)	AME (Maintenance)	X	X	
Advanced Fitter (Welding)	Aircraft Welder			X
Advanced Technician (Heat)	Aircraft Welder (5)			X
Metal Machinist	Machining (6)		X	X
Electroplater	Aircraft Electroplater		X	X
Aircraft Life Support	No Civilian Equivalent	X	X	X
Aircraft Surface Finisher	No Civilian Equivalent	X	X	X

- Notes:
1. First and second year apprentices may be employed in DM on aircraft servicing only.
 2. AME must be qualified in accordance with Section 6, paragraphs 6.3 and 6.4.
 3. Must have completed an AQF 5 level qualification in Electronics or equivalent.
 4. For on-aircraft OM employment only may be Mechanical-AME who has completed the applicable structures competencies.
 5. To be qualified as Heat Treatment Specialist, the member must successfully complete Heat Treatment training and appropriate TAFE course (course availability unknown).
 6. To be employed in Machining duties, the member must have demonstrated the machining competencies applicable to the employment tasks (Section 5, paragraph 5.8 refers).