



1 Introduction

This document provides the criteria to be used for assessing applicants under the general area of practice of Aerospace Engineering.

Management of the general area of practice of Aerospace Engineering is the responsibility of the Joint Board for Aerospace Engineering, formed by Engineers Australia and the Royal Aeronautical Society, Australian Division.

A Competency Panel, appointed by the Joint Board, is responsible for setting the standards including conduct of audits and has produced the Guideline.

Assessment of applications is the responsibility of an Assessment Panel, established by the Competency Panel, and comprising experienced practitioners from the Society and Engineers Australia.

Administration of the registration scheme is the responsibility of the Associate Director Registration, Engineers Australia.

The general area of practice of Aerospace Engineering is to distinguish professional engineers competent in the practice of Aerospace Engineering, and to facilitate the recognition of Chartered Professional Engineers of Engineers Australia applying for dual membership under the Heads of Agreement with the Royal Aeronautical Society, Australian Division

2 Background to Aerospace Engineering

Aerospace Engineering is multidisciplinary in nature. By definition, it is “the practice of the art and science of engineering for the purpose of achieving optimal integrated aerospace systems including military and civil air and space vehicle systems”.

Broadly speaking, the areas of practice embraced by Aerospace Engineering, in the context of the aerospace environment, involve, inter alia:

- Aerodynamics and performance
- Aircraft stores
- Airports and ground systems
- Airways systems
- Cabin environment

- Cockpit ergonomics
- Communications systems
- Computer systems and avionics
- Crashworthiness
- Electrical systems
- Electronic warfare
- Environmental effects
- Fire safety and control
- Flight management systems
- Flight simulators
- Flight test recording
- Fuels and lubricants
- Hydraulic systems
- Maintenance
- Materials and manufacturing
- Navigation systems
- Noise and acoustic effects
- Propulsion systems
- Radar systems
- Risk management
- Satellite systems
- Software
- Structural integrity
- Test flight control
- Tracking systems
- Vehicle dynamics
- Vehicle launch and recovery

The scope of activities by individuals or organisations practising in Aerospace Engineering includes, but is not necessarily limited to:

- Air safety Investigation
- Certification
- Design and documentation
- Education and training
- Installation
- Manufacture and supply
- Operation and maintenance
- Quality assurance
- Research and development
- Risk management
- Test and evaluation
- User and regulatory requirements

Accredited or recognised Aerospace Engineering degree courses are established in Australia and overseas; however, many applicants seeking recognition as aerospace engineers will have academic qualifications and professional experience in other fields. Such applicants will need to show that they have received adequate training and practised independently, or under general direction, as aerospace engineers

3 Areas of Practice

The main areas of practice include, but are not limited to the following:

1. Aerospace vehicle performance including dynamics
2. Aircraft stores clearance for the carriage, employment and jettison of aircraft stores such as missiles, bombs, pods and electronic warfare expendables including compatibility of aerodynamic, structures, flutter, environmental, electromagnetic, performance and drag, separations, ballistics and operational flight program analyses, and systems safety
3. Airports and launch systems, relationships to population distribution, terrain, noise and geographic conditions
4. Airways traffic, enroute and terminal separation, control communication, noise reduction, and data recording systems (visual, radar and aural)
5. Cabin environment control, including system and equipment design and selection, pressurisation and temperature control, compressors, coolers, valves, ducts, air re-circulation and acoustics
6. Cockpit design, layout of instrument panels, ergonomic visual and manual access to all controls, indicators, switches and emergency equipment
7. Crashworthiness including occupant and cargo restraint, survivability and escape systems, and affect of external environment on crash-worthiness measures
8. Flight test data telemetry and recording of air vehicle parameters acquired through sensor integration and avionics systems interfaces
9. Electrical generation and distribution system design and selection of components including, stand-by emergency and battery, load reduction, circuit protection, failure detection and signalling, cable and connectors, looms and protection
10. Fire detection and suppression system design and component selection, smoke detectors, over temperate detectors, infrared sensors, fire warning indicators and tests, interior insulation and materials to withstand rising temperatures and not generate noxious fumes
11. Flight management and control systems including integration and recording of vehicle data, navigation, landing and avoidance systems
12. Flight simulation, including system design and operation, computer hardware and software development, human factors and training
13. Flight test planning, execution and evaluation of air vehicles
14. Hydraulic systems, including system and equipment design and selection, prime, alternate and emergency power sources, accumulator, pipes, hydraulic fluids, linear and rotary actuators
15. Propulsion systems, including power plant and equipment, intakes, exhausts, fuels and lubricants
16. Satellite systems design and operation, including tracking and control systems, sensor systems, ground systems, and data management.
17. Structural design integrity under static and dynamic conditions, including damage tolerance and durability evaluation, corrosion and environmental damage effects, repairability and selection of suitable materials and processes
18. Maintenance and facilities, including management, planned preventive maintenance, and total asset and facility database management.
19. Materials and manufacturing including aircraft components, assemblies and systems
20. Receiving and transmission systems across a wide frequency band with airways control systems and operator communications
21. Risk management by identification, analysis, assessment and treatment of risks to life safety, including classification of risk and risk minimization

Applicants should note that recognition in a specific area of practice of civil or military aerospace engineering in Australia may be subject to particular requirements specified by relevant authorities. Australian civil aerospace engineering requirements are included in current publications of the Civil Aviation Safety Authority and Australian military aerospace engineering requirements in current publications of the Australian Defence Force.

4 Eligibility Requirements for Registration

Applicants must possess an academic qualification (eg. a four year engineering degree), accredited or recognised by Engineers Australia, or equivalent overseas qualification. They must also be able to satisfy the Australian Engineering Competency Standards for Stage 2 Professional Engineers.

In addition to their qualifications and experience, applicants will need to demonstrate:

- That aerospace engineering is a significant part of their professional employment or practice
- That they practise independently or under general direction as aerospace engineers in at least one of the areas of practice identified in Section 3 above

5 The Application & Assessment Process

5.1 Making an Application

The following sections indicate what you must do to register on NPER in the general area of practice of Aerospace Engineering.

You do not need to join Engineers Australia to register on NPER.

5.2 Required Documents

If you are registered on NPER in another area of practice, or if applying for NPER – Aerospace as your first general area of practice you must complete the supplementary form attached to this Guideline, in addition to your Application for Registration on NPER.

If you are a CEng MRAeS you may apply for registration on NPER – Aerospace Engineering using the *Mutual Recognition Agreement* application form (www.engineersaustralia.org.au >Join Engineers Australia). The form will also enable you to obtain Chartered Membership (CPEng) if you wish. If you do not wish to gain Chartered Status at the same, time, please mark on the form that you only require NPER registration

If you are a CPEng you may apply for registration on NPER – Aerospace Engineering using the form for an *Application for Registration on NPER* (www.nerb.org.au >applying). You must submit a Statement of Experience and evidence of how you have kept up to date in your practice, as explained on the application form. If your academic qualification is in a field other than aerospace engineering, you must show in your Statement of Experience and your

record of continuing professional development (CPD) that you have received adequate formation in the discipline of aerospace engineering.

If you are neither CPEng nor CEng (UK) you must follow the application guidelines in the *Chartered Status Applicant's Handbook* (www.engineersaustralia.org.au >education >chartered status) (even if you do not intend to join Engineers Australia) to write an Engineering Practice Report, and use the application form in it to apply for NPER Aerospace Engineering. If you are MRAeS, but not CEng (UK), you may apply by this route irrespective of your qualifications. The same process will also allow you to obtain Chartered Membership (CPEng) if you wish.

All applicants must provide clear evidence that they have worked competently in areas covered by Aerospace Engineering, and show that they meet the requirements described in this Guideline. Your documents must be reviewed and substantiated by an experienced professional engineer as being a true representation of your recent responsibilities.

5.3 Assessment

If you are a CEng MRAeS you will be registered on NPER – Aerospace Engineering on confirmation that you are a Corporate Member of the Royal Aeronautical Society and registered as a Chartered Engineer.

If you are a CPEng your Statement of Experience and CPD will be analysed for evidence that you meet the requirements for Aerospace Engineering (see Section 4 above). You may be invited to attend an interview with a member of the Aerospace Engineering Assessment Panel, as explained on the application form.

If you are not a Chartered Professional Engineer (CPEng or CEng) you will be assessed for registration as explained in the *Chartered Status Applicant's Handbook* (www.engineersaustralia.org.au >education >chartered status) When your Engineering Practice Report is accepted, you will attend a professional interview lasting about one hour as explained in the Handbook.

Your application for recognition in the Aerospace Engineering general area of practice, together with appropriate attachments and fees, must be forwarded to: Associate Director Registration, Engineers Australia, 11 National Circuit, Barton ACT 2600
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SUPPLEMENTARY FORM FOR AN APPLICATION FOR REGISTRATION IN NPER – AEROSPACE ENGINEERING

Applicant's NameEA Membership/Registration No

If already registered on NPER in another area of practice or if applying for NPER – Aerospace as your first general area of practice, attach this form to an *Application for Registration on NPER*.

If applying concurrently for Chartered Professional Engineer (CPEng), attach this form to the form in the *Chartered Status Applicant's Handbook*.

A1. Demonstrated Responsibility in Aerospace Engineering

I have provided professional services independently, or under general direction, in Aerospace Engineering in the following positions:

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Please provide, in your Statement of Experience, details of these positions, stating the functions you performed and the responsibilities you accepted. (If necessary, attach a separate summary sheet for A1)

A2. Professional Practice in Aerospace Engineering

You must demonstrate that you practise in at least one of the areas in Section 3. In summary of your application, please indicate your professional involvement in one or more of the following. Please ✓

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| <input type="checkbox"/> Aerodynamics & Performance | <input type="checkbox"/> Aircraft Stores | <input type="checkbox"/> Airports & Ground Systems |
| <input type="checkbox"/> Airways Systems | <input type="checkbox"/> Cabin Environment | <input type="checkbox"/> Cockpit Ergonomics |
| <input type="checkbox"/> Communications Systems | <input type="checkbox"/> Computer Systems / avionics | <input type="checkbox"/> Crashworthiness |
| <input type="checkbox"/> Electrical Systems | <input type="checkbox"/> Electronic Warfare | <input type="checkbox"/> Environmental Effects |
| <input type="checkbox"/> Fire Safety & Control | <input type="checkbox"/> Flight Management Systems | <input type="checkbox"/> Flight Simulators |
| <input type="checkbox"/> Flight Test Recording | <input type="checkbox"/> Fuels & Lubricants | <input type="checkbox"/> Hydraulic Systems |
| <input type="checkbox"/> Maintenance | <input type="checkbox"/> Materials & Manufacturing | <input type="checkbox"/> Navigation Systems |
| <input type="checkbox"/> Noise & Acoustic Effects | <input type="checkbox"/> Propulsion Systems | <input type="checkbox"/> Radar Systems |
| <input type="checkbox"/> Risk Management | <input type="checkbox"/> Satellite Systems | <input type="checkbox"/> Software |
| <input type="checkbox"/> Structural Integrity | <input type="checkbox"/> Test Flight Control | <input type="checkbox"/> Tracking Systems |
| <input type="checkbox"/> Vehicle Dynamics | <input type="checkbox"/> Vehicle Launch & Recovery | <input type="checkbox"/> Other (specify below) |

Other: (if you have ticked "other" in the table above, please describe the aerospace areas below)
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This summary of my involvement in Aerospace Engineering and the details reported in my Statement of Experience and other supporting documents are correct.

Signed Date/...../.....