



1 Introduction

This document provides the criteria to be used for assessing applicants for registration on NPER under the general area of practice of Naval Architecture.

Management of the general area of practice of Naval Architecture is the responsibility of the Joint Board for Naval Architecture, formed by Engineers Australia and the Royal Institution of Naval Architects (RINA).

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 appointed by Engineers Australia in consultation with RINA.

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

2 Background to Naval Architecture

Naval Architecture is multidisciplinary in nature but, at its simplest: A Naval Architect is a Ship Designer.

To expand on this: A Naval Architect is a professional engineer who is responsible for the safe design and specification of ships, boats, and marine structures, both civil and military, including merchant ships (cargo and passenger), warships, submarines & underwater vehicles, offshore structures (fixed & floating), high speed craft, workboats and pleasure craft. The Naval Architect can also be involved in, or manage, the construction, repair / refit or operation of such ships / marine structures.

Bachelors of Engineering courses in Naval Architecture are established at UNSW and AMC with full accreditation by RINA and Engineers Australia.

The basic competency of a Naval Architect is the ability to assemble and apply the relevant elements of science and technology into the safe design and construction of a ship. Some of the required competencies are held to a greater or lesser extent by those in other branches of engineering but it is the Naval Architect who has the competency and responsibility to bring all of these elements together

to form a ship / marine structure capable of meeting its operational criteria in the marine environment within the design limitation imposed by the force of weather such as wind, waves and tidal action.

A typical listing of the areas involved is shown at Section 3 but, as with other areas of engineering, some practitioners and researchers specialise in quite narrow segments of those competencies.

It should be particularly noted that Naval Architecture is essentially related to the form, arrangement, stability, structure and integration of the ship / marine structure. Naval Architecture is distinguished from Marine Engineering, which covers the design, construction and operation of engineering systems on-board the ship or marine structure.

The scope of organisations in which Naval Architects practice can include, but is not limited to: education & training, research & development, design & documentation, project management, construction & repair, operation & maintenance, risk management & quality assurance, regulation & legislation, consulting & surveying, marketing & sales.

Certificate-level courses for Naval Architecture Technologists have also been accredited.

Aside from professional engineer Naval Architects, there are many persons of engineering technologist and engineering officer grades working in the industry, forming essential parts of the Naval Architecture design teams. Specifically, draftpersons also have to be skilled in the art of ship / marine structure construction and knowledgeable in the safety and structural regulations.

Unlike any land-based structure, ships / marine structures have to be designed to operate safely on a moving surface, namely the sea or another body of water. Unlike any land-based engineering designed tasks, this requires the Naval Architect to have the skill to design the structure for a wide range of dynamic forces, and to understand how persons on board respond to a moving environment. Ships at sea are often operating outside of the jurisdiction of any country and therefore a knowledge of the internationally agreed safety and environmental protection regulations are essential. These specialist skills are embodied in the Naval Architect.

3 Areas of Practice

The main areas of practice, both civil & military, include, but are not limited to the items listed below. It should be noted that specialisation in any of these areas is not limited to naval architects but may be performed by other engineers and technologists working in conjunction with naval architects:

1. Research & Development

- Hydrodynamics
- Structures
- Stability & seakeeping
- Construction techniques
- Production processes
- Materials science
- Novel craft

2. Design & Documentation

- Vessel specifications
- Contract preparation & management
- Site supervision
- Test bed trials
- Sea trials & vessel acceptance
- Statutory & class requirements
- Simulation and model testing
- Hydrodynamics, resistance & propulsion
- Hydrostatics & stability (intact and damaged)
- Freeboard and subdivision
- Ship motions, seakeeping & controllability
- Steering and manoeuvrability
- Structures & loading (global & local)
- Vessel arrangement (overall & compartments)
- Power plant and machinery systems
- Deck machinery & cargo handling
- Ballast, services and cargo piping systems
- Vibration & acoustics
- Heating, ventilation, airconditioning & refrigeration systems
- Preservation and corrosion control systems
- Lifesaving & safety equipment & systems
- Fire protection, detection & fire fighting equipment & systems
- Electrical & electronic systems
- Communication and navigation systems
- Specialist payload systems (military, fishing, offshore, etc)
- Pollution prevention equipment & systems
- Environmental protection

3. Production

- Build strategy development and implementation
- Production scheduling & production control
- Quality assurance & quality control
- Materials management
- Fabrication & assembly processes
- Hull construction
- Launching calculations and practices

- Docking and undocking calculations and practices
- Production management
- Corrosion control systems (active & passive)
- Painting & protection
- Outfitting processes
- Commissioning & sea trials
- Shipyard layout, machinery and production facilities

4. Operation, Repair and Maintenance

- Cargo loading & stability
- Maintenance management (planned, preventive, condition monitoring)
- Safety & security management
- Refitting and refurbishment
- Preservation and corrosion control in service
- Life cycle management & recycling
- Environmental management
- Operational economics & management
- Docking and slipping operations

5. Risk Management

- Business continuity management
- Governance & due diligence
- Safety & environmental

6. Regulatory, Consulting & Surveying

- Flag state implementation of international regulations
- Classification society surveys (exclusive & non-exclusive)
- Government surveys (international, national, local, port state)
- Salvage association & insurance surveys
- Condition surveys & assessment
- Legislation development and compliance monitoring
- Design approvals
- Site inspection
- Inter-governmental relations
- International conventions
- Environmental management
- Safety & security management

7. Education & Training

- Knowledge and skills development in the areas described in 1 to 6 above

8. Marketing & Sales

- Design and product development to meet client needs

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 Professional Engineers at Stage 2.

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

- That Naval Architecture is a significant part of their professional employment or practice, and
- That they practise independently or under general direction as naval architects in at least one of the areas of practice listed in Section 3 above.

5 The Application and 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 Naval Architecture.

You do not have to be a College Member to register as a naval architect on NPER and you do not need to join Engineers Australia to register on NPER. If you choose not to join Engineers Australia, you must complete a *Registration Applicant's Declaration* (www.nerb.org.au >applying).

5.2 Required Documents

All applicants must complete the attached form, in addition to other forms indicated below.

If you are a CEng (UK) MRINA or a Chartered Member of RINA, you may apply for registration on NPER – Naval Architecture using the *Mutual Recognition Agreement* application form, (www.engineersaustralia.org.au >Join Engineers Australia). Your completed application form must be accompanied by a Statement of Experience and a record of continuing professional development (CPD) that shows you have kept up to date in your practice of naval architecture.

These documents will also enable you to be considered for CPEng, if you wish to join Engineers Australia.

If you are a CPEng, you may apply for registration on NPER – Naval Architecture using the form for *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 Naval Architecture, 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 Naval Architecture.

If you are neither CPEng nor CEng (UK), you must follow the 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 Appendix G of the Handbook to apply for registration on NPER – Naval Architecture.

If you are a Corporate Member of RINA but not CEng(UK), you should take the matter up with Secretary of RINA Australian Division (email kadams@zeta.org.au or mail to PO Box 976, Epping NSW 1710).

These documents will enable you to be considered for Chartered Membership (CPEng) and College Membership if you wish to join Engineers Australia.

All applicants must provide clear evidence that they have worked competently in areas covered by Naval Architecture, 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 MRINA, or a Chartered Member of RINA, you will be registered on NPER – Naval Architecture on confirmation that you are a Chartered Member of the Royal Institution of Naval Architects and could be registered as a Chartered Engineer. Your Statement of Experience and CPD record will be assessed for currency against the requirements for Naval Architecture set out in Section 3 of this guideline

If you are a CPEng, your Statement of Experience and CPD will be analysed for evidence that you meet the requirements for Naval Architecture (see Sections 3 and 4 above). You may be invited to attend an interview with a member of the Naval Architecture Assessment Panel, as explained on the application form.

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

Your application for recognition in the Naval Architecture 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



SUPPLEMENTARY FORM FOR AN APPLICATION FOR REGISTRATION IN NPER – NAVAL ARCHITECTURE

Applicant's NameMembership/Registration No

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

Chartered Members of the Royal Institution of Naval Architects must provide Membership No

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 Naval Architecture

I have provided professional services independently, or under general direction, in Naval Architecture 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 Naval Architecture

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"/> Research and Development | <input type="checkbox"/> Design and Documentation | <input type="checkbox"/> Production |
| <input type="checkbox"/> Operation, Repair, Maintenance | <input type="checkbox"/> Risk Management | <input type="checkbox"/> Education and Training |
| <input type="checkbox"/> Regulation, Consulting, Surveying | <input type="checkbox"/> Marketing and Sales | <input type="checkbox"/> Other (specify below) |

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

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