

The Royal Institution of Naval Architects



Guidance on the accreditation of Graduate Training Programmes leading to Corporate membership (MRINA) and registration (CEng)

July 2015

INTRODUCTION

Graduates seeking election to Corporate membership as a Member (MRINA) and registration with the Engineering Council as a Chartered Engineer (CEng) are required to undertake a period of Initial Professional Development (IPD), comprising training and learning from experience, including some experience of a responsible nature.

It is normally expected that a graduate will require a minimum period of four years IPD to achieve the level of competence required by the Institution. This will usually consist of approximately two years of structured training and two years during which they are gaining responsible experience. However, training and the gaining of responsible experience will invariably overlap.

The Institution accredits company Graduate Training Programmes that enable the graduate to achieve the scope and level of professional competence required by the Institution during their Initial Professional Development. Where training has been carried out in accordance with such an accredited Graduate Training Programme, Graduates will only be required to demonstrate that they have achieved the required level of responsible experience when applying for election as a Member and registration as CEng.

*These guidance notes should be read in conjunction with the RINA publications **Guidance on applying for Corporate membership** and **Guidance on applying for registration***

TRAINING

Effective training will contain the following features:

- Emphasis will be placed at all times on the integration of training and academic work, on the complementary nature of theory and practice and on the practical application of analysis and theory
- Practical knowledge and experience will be obtained throughout by participating in useful work rather than observing the work of others.
- A training programme will be followed, made up of well defined objectives expressed through tasks and standards against which performance can be judged regularly. It is particularly important that graduates should be able to assess the degree of success achieved at each stage of the programme.
- Training will be challenging and relevant to the graduates' future career and should stretch their intellectual powers.
- The final period of training will include work of an engineering nature for which the graduate is held responsible, if only for a limited degree.

TRAINING PROGRAMME

Aims and Objectives

The graduates' training should build upon their educational base, and enable them to carry theory successfully into practice. Their training should also give them a broad appreciation of an organisation's business needs and encourage effective communication with other disciplines. It should include a variety of challenging experiences in a real working environment, and be supported by appropriate off-the-job training where necessary. The later stages of their training should be designed as preparation for an identified first post of responsibility.

A well structured training programme, driven by achievable objectives, supervised and mentored by professional engineers, will ensure that graduates quickly become confident and effective in the application of fundamental principles, the exercise of professional judgement and the development of engineering technology. The aim of a training programme should be to provide the graduates with structured training that will enable them to achieve the scope and level of professional competence required by the Institution for election and registration.

The Graduate Training Programme should therefore have the following objectives:

- To extend the scope of the graduates' knowledge and skills beyond their educational base.
- To develop their ability to apply their understanding of engineering principles and theory to the solving of real problems for the enhancement of their skills.
- To develop their judgement and critical powers to improve their ability to undertake engineering projects with due regard to technical, managerial, economic, financial, commercial, social and other relevant factors.
- To develop flexible attitudes so that they can meet the challenge of rapid changes involving materials, techniques and processes which are not yet fully developed or proven.
- To develop their ability to undertake engineering duties requiring a high degree of practical expertise.

Scope of Training

- **Competence and Commitment**

Graduates applying to be elected as a Member and registered as CEng must be competent by virtue of their education, training and experience to use a combination of general and specialist engineering knowledge and understanding to optimise the application of existing and emerging technology. They must be able to apply appropriate theoretical and practical methods to the analysis of engineering problems. They must be able to provide technical and commercial leadership, and demonstrate effective interpersonal skills. They must also demonstrate a personal commitment to professional standards, recognising obligations to society, the profession and the environment.

The required competencies and commitment are defined in Annex A.

- **Professional Development Objectives**

The Institution requires that these generic competencies be achieved across a range of activities relevant to the naval architecture profession and the graduate's employment, and appropriate to

the graduate's academic achievement. This requirement is defined in a number of **Professional Development Objectives** which the graduates are expected to achieve during their Initial Professional Development.

Each Professional Development Objective consists of a number of activities and the minimum levels of ability expected for each of the activities. These activities are grouped under the broad headings of Design, Engineering Practice and Management Services. However, these titles should not be taken too literally. For example, it may well be possible to achieve Management skills whilst working in a design environment, or gain Design skills whilst doing plan approval work. The Institution does not prescribe how or where the Graduate should obtain these skills.

The minimum levels of ability required in each activity are broadly defined as:

- Having knowledge or being aware of an activity's existence and the reason for it
- Having an understanding of the reason for an activity and being familiar with how it should be carried out
- Having the skill to be able to carry out an activity competently and without further guidance

The Graduate Training programme should provide the graduate with adequate opportunity to achieve these Objectives, and thereby develop the required professional competence.

The Professional Development Objectives are defined in Annex B

Supervision and Mentoring

The Training Programme should provide for the graduates to be supervised and mentored during their training:

- The graduates' Line Managers, together with the Training Officer and/or Personnel Officer should ensure that the requirements of the Training Programme are met.
- The graduate's Supervisor should preferably, but not necessarily, be a member of the Institution and provide advice on the technical content of the training programme. They should oversee the technical aspects of the Graduates' day-to-day activities and normally authenticate their training. The graduate's Supervisor could also be their Line Managers.
- Where possible, a Mentor who should be an experienced engineer, not necessarily a naval architect and preferably from another department or independent of the training organisation, should be appointed for each graduate. The Mentor should advise and guide the graduates through their training and experience. The Mentor should consult with the graduate's Line Manager and Supervising Engineer.

Record of Training

The Graduate Training Programme should require graduates to maintain an authenticated record of their activities and achievements. The format of this Training Record may be determined by the company.

However, it is recommended that the graduate maintains the Institution's IPD Logbook, which will provide the basis of the Professional Review Report when applying for Corporate membership.

ACCREDITED TRAINING PROGRAMMES

There is no prescribed format for an accredited Graduate Training Programme. The grouping and description of the activities may be chosen to reflect the company's organisation and training opportunities. However, they should provide the graduate with the opportunity to achieve the required Professional Development Objectives. The training programme should also show the levels of ability which the graduates are expected to achieve. These should not be of a lower level than stated in the Professional Development Objectives, but may be of a higher level if required by the company.

Requirements

Company Graduate Training Programmes which meet the following requirements may be accredited by the Institution:

- The Graduate Training Programme should provide the graduate with the opportunity to achieve all the Professional Development Objectives. Where a company is not be able to provide the full range of training activities required in-house, the Graduate Training Programme may include suitable external training courses or placements.
- Individual programmes should be provided for each graduate on the programme, showing the duration of each placement, and the Professional Development Objectives which the Graduate might expect to achieve during that placement.
- Graduates on Graduate Training Programmes should be required to maintain an authenticated record of their activities and achievements. The format of this Training Record may be determined by the company.
- A Training Officer, responsible for the administration of the Programme, and for monitoring the overall progress of the graduates on the Programme should be nominated.
- The Training Programme should clearly define the arrangements for monitoring and authenticating the graduate's progress and achievement.
- The Training Programme should include a regular review with the graduates of their progress.

Graduate Training Programmes that meet these requirements may be submitted for accreditation. Accreditation will be valid for a period of five years, or until significant change to the Programme is made. The Institution should be advised when there has been significant change to the Training Programme.

Partial Accreditation

Where a company cannot offer the full range of opportunity for the graduate to achieve all the required Professional Development Objectives, whether in-house or by external courses, a Graduate Training Programme may be partially accredited. In such cases, the Graduate Training Programme should clearly state where the scope or level of training is inadequate, so that the graduates are aware of the additional training they must obtain elsewhere.

APPLICATION FOR ACCREDITATION / FURTHER GUIDANCE

Further guidance on whether an existing company Graduate Training Program meets the Institution's requirements for accreditation, or assistance in producing a new Graduate Training Programme may be sought from the Professional Affairs Department at the Institution by contacting:

Professional Affairs Director
Royal Institution of Naval Architects
8-9 Northumberland Street, London, WC2N 5DA
Tel: +44 (0)20 7235 4622; Fax: +44 (0)20 7259 5912; Email: profaffairs@rina.org.uk

Applications for accreditation should be made in accordance with Annex C

Annex A: Competence and Commitments

Annex B: Professional Development Objectives

Annex C: Application for Accreditation of a Graduate Training Programme



COMPETENCE

MEMBERS CENG MUST BE COMPETENT, BY VIRTUE OF THEIR INITIAL FORMATION AND THROUGHOUT THEIR WORKING LIFE TO:

1. Use a combination of specialist knowledge and understanding to optimise the application of existing and emerging technology to the design, construction and maintenance of marine structures and related systems.

They must be able to:

- Maintain a sound theoretical approach, enabling the introduction of new and advancing technology and other recent developments to the marine setting.
- Apply a creative problem solving approach across the broad range of naval architecture based and related subjects.
- Look for ways of exploiting emerging technologies to enhance current practices and to ensure continuing fitness for purpose of engineered marine products and services
- Promote innovation and technology transfer both into and across the marine sector.

(Professional Development Objectives D2, D4, D9, E1, E2, E6 & M4)

2. Apply appropriate theoretical and practical methods to the analysis and solution of problems relating to the design, construction and maintenance of marine structures and related systems.

They must be able to:

- Identify potential projects and opportunities
- Conduct appropriate research and undertake design and development of possible solutions.
- Plan and implement solutions, taking a holistic approach to cost, benefits, safety, reliability, appearance and environmental impact.
- Evaluate and optimise naval architecture based solutions, and make improvements where appropriate.

(Professional Development Objectives D1, D5, D7 & D8)

3. Provide professional, commercial and managerial leadership.

They must be able to:

- Plan for effective project implementation.
- Plan, budget, organize, direct and control tasks, people or resources in both design and production environments.
- Develop the capabilities of staff to meet the demands of changing professional and managerial requirements.
- Bring about continuous improvement through quality management.

(Professional Development Objectives D6, E3, E4, E5. M1, M2 & M3)

4. Use effective communication and interpersonal skills.

They must be able to:

- Work and communicate with others at all levels.
- Effectively present and discuss ideas and plans, and be able to assimilate and understand ideas presented by others.
- Build teams and negotiate.

(Professional Development Objectives D3, M5 & M6)

COMMITMENT

Candidates are required to demonstrate their commitment to society, the naval architecture profession and the environment through:

- Their knowledge and application of the Institution's Code of Professional Conduct
- Their understanding of risk, the environment and the wider role of the naval architect in society
- Their commitment to life long learning through Continuing Professional Development
- Their involvement with the profession, the formation of younger naval architects and with Institution activities

Members CEng will be concerned primarily with the progress of technology through innovation, creativity and change. They will develop and apply new technologies, promote advanced designs and design methods, introduce new and more efficient production techniques and marketing and construction concepts and pioneer new engineering services and management methods. They may be involved with the management and direction of high-risk and resource intensive projects. They will be members of the engineering team. They will make a personal commitment comply with the Institution's Code of Professional Conduct, recognising their obligations to society, the naval architecture profession and the environment.

ACTIVITY	OBJECTIVES	
DESIGN		
Analytical Skills	D1.1	Be able to select and apply the appropriate engineering theory to solve real problems across a range of naval architecture based subjects.
	D1.2	Be familiar with a range of analysis techniques and their limitations, including software packages.
	D1.3	Be able to carry out calculations by hand, by specialist software packages, and by using general office software (for example creating and using spreadsheets for calculations).
Processes & Methodology	D2.1	Understand the different stages of the design process, from concept to detail design.
	D2.2	Understand design procedures.
	D2.3	Understand the implications and interaction of design on manufacture, performance and the environment.
	D2.4	Be able to apply current design procedures and devise new procedures where required by your employment.
Communication of Technical Information	D3.1	Be able to communicate and assimilate technical information through a variety of means, including: <ul style="list-style-type: none"> • Written specifications • Drawings • Reports • Presentations
	D3.2	Be familiar with the types of drawings or CAD models used and conventions employed in the marine industry, and understand their functions and uses
	D3.3	Be able to produce drawings, where required by your employment.

ACTIVITY	OBJECTIVES	
DESIGN		
Regulations & Standards	D4.1	Be familiar with the standards applicable in design and the designer's role selecting the appropriate standards to be used.
	D4.2	Understand how design methods are applied and controlled.
	D4.3	Be aware of the regulatory framework, including role of statutory bodies and class societies.
	D4.4	Be able to correctly apply appropriate design standards and work within the regulatory framework, where required by your employment.
Evaluation & Optimisation	D5.1	Be familiar with methods of evaluation and optimisation used in design
	D5.2	Be familiar with plan approval processes and internal and customer design reviews.
	D5.3	Be able to evaluate designs to ensure that they are fit for purpose.
	D5.4	Be able to apply optimization techniques to a proposed design when required by your employment.
Design Management	D6.1	Understand how design projects are organised and managed.
	D6.2	Be able to carry out basic design project management, involving planning, resources, budgets, contracts and quality assurance, where appropriate.
Safety, Risk & Hazards	D7.1	Be familiar with techniques for the evaluation of risk and measures to reduce it
	D7.2	Understand the safety implications of design and of hazard identification and amelioration.
	D7.3	Be aware of reliability techniques and factors affecting a product's through life capabilities.
	D7.4	Be able to apply techniques to achieve safe design.

ACTIVITY	OBJECTIVES	
DESIGN		
Research & Development	D8.1	Be familiar with research methods and knowledge of information sources.
	D8.2	Understand of the need for research and development, and its importance to the business.
	D8.3	Understand the necessity for experimental/laboratory work, the type of projects undertaken and the methods employed.
	D8.4	Be able to carry out efficient research and correctly interpret results, where required by your employment.
Materials	D9.1	Be familiar with the range of materials available, their use and limitations.
	D9.2	Understand of factors affecting material selection.
	D9.3	Be aware of the function of material testing and of how material specification and quality compliance is ensured.
	D9.4	Be able to specify the correct use of materials, where required by your employment.

ACTIVITY	OBJECTIVES	
ENGINEERING PRACTICE		
Overview of Production	E1.1	Be aware of production methods and product work breakdown structures
	E1.2	Be aware of the different stages of production, such as fabrication, construction, outfitting and installation.
	E1.3	Be aware of current production technologies used in the marine industry.
	E1.4	Be aware of engineering practical skills required in the marine industry.
	E1.5	Understand the correct use of current engineering technologies.
Safety & Legislation	E2.1	Be aware of safety hazards in the production environment and measures to protect against them.
	E2.2	Be aware of Health & Safety legislation and its resulting obligations on the employer and on the individual.
	E2.3	Be able to apply appropriate safety procedures.
Quality	E3.1	Be aware of quality control methods employed, standards and qualifications, non-destructive testing, and the quality assurance procedures.
	E3.2	Be familiar with quality control and assurance procedures.
Production Management	E4.1	Understand how production is organised and controlled, including, planning, budgeting, expediting, reporting of progress and control of resources – material, manpower and information.
	E4.2	Be aware of production optimization/ improvement techniques.

ACTIVITY	OBJECTIVES	
ENGINEERING PRACTICE	Continued	
Commissioning & Setting to Work, Maintenance & Operation	E5.1	Be aware of the function of commissioning and trials.
	E5.2	Be aware of the commissioning process- setting to work, trials and handover.
	E5.3	Be aware of maintenance and repair regimes and their effects on costs and operability.
	E5.4	Be able to carry out commissioning and trials correctly where required by your current employment.
Procurement	E6.1	Be aware of the relationships with suppliers, through specifications and contracts, and of how materials/components are stored and handled within a production environment.
	E6.2	Be aware of the factors that affect purchasing of materials/equipment/services.

ACTIVITY	OBJECTIVES	
MANAGEMENT SERVICES		
Accounts & Finance	M1.1	Be aware of the role of accounts in the control and administration of the business.
	M1.2	Be aware of company accounting procedures and processes.
	M1.3	Be familiar with how budgets are compiled and controlled.
	M1.4	Be able to apply correct accounting procedures.
Human Resources	M2.1	Be aware of employment legislation and its effects.
	M2.2	Be aware of the requirements for the supply and training of skilled personnel.
	M2.3	Be familiar with teamwork and leadership skills, and methods of self-development, factors affecting morale and motivation, and their effects.
	M2.4	Be able to interact and relate to all levels of personnel in an effective and constructive manner
Quality Assurance	M3.1	Be aware of quality assurance policy and documentation.
	M3.2	Understand the aims of QA policies.
	M3.3	Be able to apply correct QA procedures where required.
Company Structure & Organisation	M4.1	Be aware of company structure and the functions of differing departments or sections of the company.

ACTIVITY	OBJECTIVES		Continued
MANAGEMENT SERVICES			Continued
Marketing & Communication	M5.1	Be aware of marketing techniques, company profile, relationship with customers, the wider marine industry and with the media/public.	
	M5.2	Be aware of the factors affecting customer satisfaction.	
Managerial Skills, Contracts & Negotiations	M6.1	Be aware of different management techniques and styles, and of their application.	
	M6.2	Be aware of contractual obligations upon company and self.	
	M6.3	Be familiar with negotiating techniques and skills.	
	M6.4	Be able to manage a project, section or department efficiently.	

The following information is required in support of all applications for the accreditation of a new programme, or the re-accreditation of an existing programme where there has been significant change.

1. GENERAL INFORMATION

1.1 Name and address of company/organisation:

1.2 Name and details of individual responsible for programme delivery:

(Include name, position, address, telephone, fax and email details as applicable)

1.3 Name and details of main contact if different to 1.2 above:

(Include name, position, address, fax and email details as applicable)

1.4 Details of existing accreditations by other institutions:

1.5 Date programme introduced/expected to be introduced/last accredited:

1.6 Actual and/or anticipated number of Graduates on the Programme:

Provide details of actual Graduate numbers for the past 3 years and projections for the next 2 years.

2. PROGRAMME INFORMATION

2.1 Aims and Objectives:

Provide a short description of the aims and objectives of the Programme. Also indicate whether the Programme is intended to meet the Institution's requirements for Member, Associate-Member or Associate and corresponding registration as CEng, IEng or EngTech respectively.

2.2 Programme Structure and Content:

Provide details of Programme structure and content, showing how it will provide the graduate with the opportunity to achieve the Professional Development Objectives and responsible experience required for election as Member, Associate-Member or Associate.

2.3 Duration of programme:

State the duration of the Programme, and the time spent in each department/placement

2.4 Assessment:

Provide details of the methods in place to ensure identification and accurate assessment of the Graduate's progress and achievement during the Programme

2.5 Supervision

Provide details of methods in place to inform the Graduate of their progress

2.6 Records:

Provide details of the records required to be kept by the Graduate and the company.

SUBMISSION OF APPLICATION

This information, together with 2 copies of a typical individual training programme and all other documentation provided to the Graduate, should be forwarded to;

The Professional Affairs Director
Royal Institution of Naval Architects
10 Upper Belgrave Street
London, SW1X 8BQ
Tel: +44 (0)20 7235 4622
Fax: + 44 (0)20 7259 5912