Chartered Marine Scientist (Hydrography)

Standards

Issue 2.0

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1 Introduction

The Institute of Marine Engineering, Science and Technology (IMarEST) is the international membership body and learned society for marine professionals.

The Institute's role is to promote the scientific development and interdisciplinary understanding of marine engineering, marine science and marine technology and to uphold and advance the knowledge and status of professionals across the international marine community.

IMarEST is open to everyone associated with the marine, coastal and offshore world, across all scientific, engineering and technological disciplines and applications.

The IMarEST received its Royal Charter in 1933 and is a licensed body of both the Engineering Council and the Science Council. In accordance with our Royal Charter, the IMarEST is able to award suitably qualified and experienced applicants the title of Chartered Marine Scientist (Hydrography) (CMarSci (Hydrography)). The IMarEST is the only professional body in the world able to award this title.

2 Marine Scientists and CMarSci (Hydrography)

Chartered Marine Scientists are professionals, who harness, exploit, manage, use or apply marine science in the pursuit of knowledge, understanding of the marine environment, wealth creation and/or the provision of services in the marine sector. An individual wishing to pursue registration as CMarSci (Hydrography) will be a professional person with the academic qualifications and technical expertise to conduct one, or more, of the following activities;

- to determine, measure and represent the earth, three-dimensional objects, point-fields and trajectories underwater or from the water,
- to assemble and interpret seabed, water column and geographically related information,
- to use that information for the planning and efficient administration of the sea and any structures thereon/in; or,
- to conduct research into the above practices and to develop them.

3 The Benefits of CMarSci (Hydrography) Registration

The CMarSci (Hydrography) designation has many benefits for individuals, employers and the public as a whole. As a profession, society does not recognise Hydrographic Surveying as it does engineering or earth sciences; partly due to it being a small industry but also because it sits within larger, more recognised professions as part of large offshore projects. There has also been no one professional qualification which is globally recognised and encompasses all aspects of

Hydrographic Survey. The definition of hydrography has not been updated to reflect how hydrographic survey skills are used in today's varied industries.

Individuals who aspire to be recognised as professional hydrographic surveyors (CMarSci (Hydrography)) require independent assessment of their competence and commitment, and this standard provides the means to achieve that.

Furthermore, CMarSci (Hydrography) registration provides employers with additional assurance of the quality of their workforce. It is of benefit to:

Society, which will be more confident in the competence of an individual and need no longer be confused by a platform of letters and descriptions.

Individual practitioners, by identification as a professional that sets them at the forefront of their profession and offers a passport to mobility.

Employers, with confirmation, through the designation, of the quality of a job applicant.

Government departments, seeking to appoint advisers or consultants would have an assurance about the level of an individual's expertise.

Professional bodies, with provision through the new designation of additional opportunities to benchmark their qualifications.

Higher education, which will be better able to set and monitor benchmarks for their courses, and to promote programmes of study to meet the high standards required of CMarSci (Hydrography).

Regulatory Authorities, who could be confident in specifying the designation in legislation and regulations.

Legal credibility, enabling expert witness participation at a defined standard.

Professional standing, recognising equality of excellence across the hydrographic profession.

4 What is the required knowledge and competence?

CMarSci (Hydrography) is open to everyone, who can demonstrate the required high-level knowledge, understanding and professional competence. The exemplifying educational standard is a Master's level qualification in an approved subject. There are many routes that can be measured to meet this standard, including a combination of academic awards, vocational

qualifications and experiential learning through work. Competence includes the knowledge, understanding and skills that underpin performance.

CMarSci (Hydrography) registrants are required to maintain their professional competence, working within professional codes of conduct and participate actively within their profession. There is also a requirement for continuing professional development (CPD).

5 Assessment of knowledge and competence

The IMarEST is the only organisation able to confer CMarSci (Hydrography) on individuals, who meet the criteria.

To become a CMarSci (Hydrography) registrant, applicants must have their competence assessed by the IMarEST. The assessment is made against standards rigorously applied by the IMarEST's Professional Affairs and Education Committee (PAEC) and Membership Committee.

The process of assessment starts with a written application to the IMarEST's Membership department. Claims to qualifications, experience and training will require formal documented evidence. In giving details of experience, applicants will need to show how this relates to the required competencies for CMarSci (Hydrography).

Following a review of the documented evidence, the Membership Committee will require the applicant to undertake a Professional Review Interview (PRI)[1]. The Membership department will inform the candidate of the necessary procedures. If there appear to be gaps in the applicants competency statements , the Membership Committee will usually be able to suggest ways in which they can be addressed (this may involve further learning, training or additional experience). If a candidate receives a positive decision on their application for CMarSci (Hydrography), they will become Chartered, and their details will be included on the Register. Retention of the designation will require continued membership of the IMarEST and payment of the required subscription and undertaking the required CPD.

[1] Any interviews will be conducted in English, subject only to the provisions of the Welsh Language Act 1993 and any Regulations, which may be made in implementation of European Union directives on free movement of labour.

6 What needs to be demonstrated?

6.1 Competence

The following table details the generic competences that must be demonstrated in order to achieve registration as for CMarSci (Hydrography). Given the diverse nature of scientific and technological practice within the field of hydrography, achieving the required level for these professional competencies will involve a broad range of activities. Candidates who believe they meet these or who wish to work towards them, should approach the IMarEST's Membership department to obtain further details on how to apply for registration.

The Competence and Commitment Standard for CMarSci (Hydrography) registrants. CMarSci (Hydrography) registrants must be competent throughout their working life, by virtue of their education, training and experience, to:	**Guidance** These are examples of activities which could demonstrate that you have achieved the CMarSci (Hydrography) criteria.
A Apply knowledge and understanding.	
A1 Use specialist experiential knowledge and broader scientific understanding to optimise the application of existing and emerging science and technology.	• Engage in formal post-graduate academic study. • Learn and develop hydrographic survey techniques in the workplace. • Broaden your knowledge of hydrographic data analysis techniques. • Write and present papers, reports standards to internal and external audiences. • Conduct research in the field of hydrographic survey to facilitate design and development of scientific processes. • Identify and agree appropriate research methodologies.
A2 Exercise sound judgement in the absence of complete information and in complex or unpredictable situations. This could include an ability to: • Identify and be aware of the limits of your own knowledge and professional competence. • Demonstrate ability to manage own strengths and	• Apply a novel approach to solving a hydrographic problem. • Use of appropriate expertise from colleagues and/or external sources to achieve solutions.

weaknesses. • Recognise levels of risk attached to actions.	
A3 Demonstrate critical evaluation of relevant scientific information and concepts to propose solutions to problems. This could include an ability to: • Select the best methodology and data analysis. • Overcome any barriers or issues.	• Conduct statistically sound appraisal of hydrographic data. • Use evidence from best practice to improve effectiveness. • Engage in experimental design and testing. • Review relevant hydrographic literature and methodologies and manuals or designs of hydrographic survey equipment. • Establish and help develop solutions to meet users' requirements. • Enhance hydrographic survey practices, products, processes, systems and services. • Share findings with others. • Undertake hydrographic survey or research project design.
B Personal Responsibility.	
B1 Work autonomously and take responsibility for the work of self and others.	• Demonstrate work is undertaken without day-to-day supervision. • Demonstrate when it is appropriate to seek guidance from others and how this can be obtained. • If responsible for managing the work of others demonstrate how responsibilities are discharged.
B2 Promote and implement robust policies and protocols relating to health, safety, and security. This could include an ability to: • Demonstrate understanding related to health, safety and security that apply to the work being undertaken. • Understand issues related to data confidentiality, Intellectual Property, confidentiality, traceability of documents and information.	• Undertake formal health and safety training. • Work within health and safety legislation and best practice. • In the UK, examples include HASAW 1974, CDM regulations, OHSAS 18001:2007 and company safety policies. • Carry out safety audits. Identify and minimise hazards. Assess and control risks. Evaluate the costs and benefits of safe working. Deliver strategic health and safety briefings and inductions. • Understand issues related to

	hydrographic data, Intellectual Property and confidentiality. • Understand issues related to data archiving, metadata and traceability of information documents.
B3 Promote and ensure compliance with all relevant regulatory requirements and quality standards. This could include an ability to: Demonstrate which regulatory requirements and quality standards apply to your area of work.	• Describe which hydrographic standards and regulations are applicable. • Promote the awareness of relevant regulations and standards amongst peers and junior colleagues. • Apply diversity and anti-discrimination legislation.
B4 Oversee the implementation of solutions with due regard to the wider environment and broader context. This could include an ability to: • Operate and act responsibly, taking account of the need to progress environmental, social, and economic outcomes simultaneously. • Use imagination, creativity, and innovation to provide products and services which maintain and enhance the quality of the environment and community and meet financial objectives. • Understand and secure stakeholder involvement in sustainable development. • Use resources efficiently and effectively.	• Carry out environmental risk assessments. • Plan and implement best practice environmental management systems, e.g. ISO 14000. • Manage best practice risk management systems e.g. ISO 31000. Work within environmental legislation. • Adopt sustainable practices. Achieve social, economic and environmental outcomes. • Raise awareness of how hydrography is portrayed as a profession and how hydrography is viewed by the public at large. • Describe how to avoid any reputational damage that may be related to the work carried out.
C Interpersonal skills.	
C1 Demonstrate the ability to communicate effectively with specialist and non-specialist audiences. This could include an ability to: • Lead, chair, contribute to and record meetings and discussions. • Prepare communications, documents, and reports on complex matters. • Exchange information and provide advice to technical and non-technical colleagues. • Prepare and deliver presentations on strategic	• Produce reports, letters, emails, visual displays of data and information, and working papers (e.g. meeting minutes, planning documents, correspondence) in a variety of formats. • Engage or interact with professional networks. • Present to clients and/or stakeholders.

matters. • Lead and sustain debates with audiences.	
C2 Demonstrate effective leadership through the ability to guide, influence, inspire and empathise with others. This could include an ability to: • Agree objectives and work plans with teams and individuals. • Identify team and individual needs, and plan for their development. • Reinforce team commitment to professional standards. • Lead and support team and individual development • Assess team and individual performance, and provide feedback. • Be aware of the needs and concerns of others, especially where related to diversity and equality.	• Undertake or receive mentoring or coaching and assess the effectiveness. • Bring about change management. • Lead/manage/value Hydrographic Survey and whole life costing. • Lead project survey teams.
C3 Demonstrate the ability to mediate, develop and maintain positive working relationships. This could include an ability to: • Know and manage own emotions, strengths and weaknesses. • Know how to handle challenging interpersonal situations and demonstrate ability to mediate and achieve a positive outcome. • Create, maintain and enhance productive working relationships, and resolve conflicts.	• Manage mergers or integration of different teams. • Manage working relationships across different departments or organisations both within the hydrographic sector and wider. • Interact with hydrographic committees, working groups and undertake professional body activities related to hydrography.
D Professional practice.	
D1 Scope, plan and manage multifaceted projects.	• Lead/manage project planning activities-operational projects utilising resources across several disciplines or change management projects. • Undertake projects that establish guidance on hydrographic standards and data requirements. • Produce and implement procurement plans. • Carry out project risk assessments. • Collaborate with key stakeholders, and negotiate agreements. • Tender for contracts or make applications for research funding.

D2 Demonstrate the achievement of desired outcomes with the effective management of resources and risks.	• Plan programmes and delivery of tasks. Identify resources and costs. • Negotiate and agree contracts/work orders. • Monitor the progress of activities. • Identify, evaluate and implement changes that may be needed to ensure that the activities are successfully completed. • Identify and manage of risks.
D3 Take responsibility for continuous performance improvement at both a personal level and in a wider organisational context.	• Identify lessons learnt. • Evaluate the performance of any survey methods and equipment used. • Develop recommendations for future enhancements or modifications to procedures or working practices in order to achieve performance improvements.
E Professionalism	
E1 Demonstrate understanding and compliance with relevant codes of conduct. This could include an ability to: • Comply with the rules of professional conduct of own Institution. • Lead work within all relevant legislation and regulatory frameworks, including social and employment legislation.	• Demonstrate awareness of standards of professional practices in respect of the hydrographic profession. • Demonstrate awareness of standard of professional behaviour in respect of attitudes, respect and confidentiality. • Demonstrate awareness of standards of professional competence in respect of personal development and the development of others.
E2 Demonstrate a commitment to professional development through continuing advancement of own knowledge, understanding and competence. This could include an ability to: • Undertake reviews of own development needs. • Plan how to meet personal and organisational objectives. • Carry out planned (and unplanned) CPD activities. • Maintain evidence of competence development. • Evaluate CPD outcomes against any plans made. • Assist others with their own CPD.	• Keep up to date with national and international hydrographic initiatives. • Maintain CPD plans and records. • Become involved with the affairs of the IMarEST. • Show evidence of professional development through on-the-job learning, private study, in-house courses, external courses and conferences related to hydrography.

6.2 Education

Knowledge and understanding are important components of professional competence. Formal education is the usual, though not the only, way of demonstrating the necessary knowledge and understanding, and the following qualifications exemplify the required knowledge and understanding for CMarSci (Hydrography):

- an approved Masters degree in Hydrography/Hydrographic Survey,
- an IHO Category A qualification,
- a Higher National Diploma, a Foundation Degree or Bachelors Degree in Hydrographic Survey or technology or a related subject, plus appropriate further learning to Masters level, or
- an approved degree apprenticeship programme.

Applicants who do not have exemplifying qualifications may demonstrate the required knowledge and understanding in other ways, but must clearly demonstrate they have achieved the same level of knowledge and understanding as those with exemplifying qualifications.

Ways to demonstrate this include:

- taking further qualifications, in whole or in part, to demonstrate Masters level knowledge,
- completing an appropriate work-based or experiential learning application, or
- writing a technical report, based on their experience, and demonstrating their knowledge and understanding of Hydrographic Survey principles to Masters level.

7 Professional Development

Professional Development is a key part of developing the competence required to achieve the standard for CMarSci (Hydrography) registration. Aspiring registrants learn to apply their knowledge and understanding and apply professional judgement through professional development. Many larger employers run well-established graduate training and development schemes, some of which are accredited by the IMarEST for the purposes of registration.

Accredited Professional Development schemes, however, are not the only route to achieving the professional development necessary for CMarSci (Hydrography) registration. In the absence of an accredited scheme, aspiring registrants will need to develop profiles of competence and professional activity in accordance with the competence and commitment statements in section 6.1.

Anyone seeking registration should maintain a detailed record of their development, responsibilities and experience, verified by referees, in order to be best prepared to provide the evidence of professional competence commensurate for CMarSci (Hydrography) registration.

7.1 Maintaining competence and demonstrating a commitment to CPD

Once CMarSci (Hydrography) registration has been achieved, individuals have an obligation to maintain professional competence. Guidance on CPD (including a downloadable CPD record) can be found on the IMarEST website (www.imarest.org).

7.2 The IMarEST's Rules of Professional Conduct

All members of the Institute are required to make a personal commitment to live by the appropriate codes of professional conduct, recognising their obligations to society, the marine professions and the environment (imarest.org/about-us/governance/the-rules-of-professional-conduct.html).