

# Information on Routes to Chartered Status for Hydrologists

British Hydrological Society

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# 1 Objectives of Report

This report provides BHS members with information on the current opportunities and procedures for hydrologists aiming to become Chartered. The aim is to resolve confusion and misunderstanding of issues of professional affiliations and qualifications, and to help hydrologists to intelligently choose and plan the best route to chartership for their individual circumstances.

This report provides a summary of the options available and the associated procedures, requirements, fees, and further information sources. It has been prepared by members of the BHS Main Committee. The committee would welcome any comments or corrections which would lead to improvements to this document, but cannot be involved in any individual member's application for Chartered status. A glossary of terms is included as Appendix C:.

# 2 Background

Becoming Chartered provides many benefits. Principally it allows hydrologists to prove that they are professional and work to a high standard. This has many knock-on benefits for career progression. There are currently six Chartered Status options relevant to hydrologists practising in the UK:

|   |        |
|---|--------|
| Chartered Engineer                        | CEng   |
| Chartered Environmentalist                | CEnv   |
| Chartered Scientist                       | CSci   |
| Chartered Meteorologist                   | CMet   |
| Chartered Geographer                      | CGeog  |
| Chartered Water and Environmental Manager | FCIWEM |

Some of these may be achieved by several alternative routes (see section 4). Becoming Chartered involves considerable commitment, hard work and financial cost. Therefore it is important for each individual to carefully choose the best qualification and route, depending on: academic background, work experience and current role, anticipated career trajectory, and what the individual wants from chartership.

In order to understand the issues and procedures behind getting Chartered, it is helpful to first distinguish between the professional institution to which a hydrologist may apply for Membership (e.g. ICE, CIWEM, RMetS, RGS, IWO), and the Council or Society who can register applicants as 'Chartered' and who dictate the basic requirements for award of that title (e.g. the Engineering Council, the Society for the Environment, the Science Council). For simplicity the first group are referred to in this report as 'Institutions' and the second group as 'Councils', although they do not all have those titles.

The Councils and most of the Institutions have a 'Royal Charter' granted by the Privy Council (a government office) which gives them authority to grant the title Chartered. The Institutions, among many other things, assess candidates, both for Membership of themselves and for registration with the Council as Chartered. This includes setting a specific list of professional development requirements

often called 'Development Objectives' or 'Mandatory Competences', which include the Council's basic criteria for attaining Chartered status, and may include more specific Institution requirements.

ICE, CIWEM, RMetS and the RGS have Royal Charters, and applicants may become Chartered directly via any of these without reference to an external Council, although registrations with one or more external Councils may also be applied for. IWO do not have their own Royal Charter and so cannot give Chartered status directly, however through membership application may be made for Chartered status with a Council (e.g. CEnv via The Society for the Environment). There are also various options for achieving membership (or grade of membership) of the Institutions without necessarily becoming Chartered. To get Chartered status normally involves submitting written reports documenting experience to demonstrate the required competences, and attending a face-to-face interview (often called a professional review). The specific requirements vary for each Institution and Council.

### **3 The Councils**

The principal organisations responsible for Chartered Status are:

|                             |      |
|-----------------------------|------|
| Engineering Council         | CEng |
| Society for the Environment | CEnv |
| Science Council             | CSci |

The Engineering Council also registers Incorporated Engineers (IEng).

Applicants to the Councils must be a member of a professional body recognised by the Council or Society – for example CIWEM is affiliated to all three. Procedures for award of Chartered status vary slightly, but essentially are dealt with by the recognised body in accordance with the requirements of the Council or Society.

Applicants must meet defined requirements for qualifications/experience/competence levels and demonstrate commitment to maintaining that competence (Continuing Professional Development or CPD). These are broadly similar to the requirements for membership of the appropriate recognised body, but there are some differences – for example Chartered Scientist requires an MSc. In some cases, a PhD can count as work experience and as an academic qualification (e.g. a relevant PhD counts as 2 years' experience for the RMetS). Student vacation work can also count towards meeting objectives if it is relevant, documented and signed off. The detailed requirements for each council are available on their websites.

## **4 Institutions and Summary of Routes**

### **4.1 Institution of Civil Engineers**

The Institution of Civil Engineers (ICE) offers a range of grades of Membership and paths for getting there, depending on qualifications and experience. There are three fundamental stages towards becoming a professionally qualified Member: The Educational Base (i.e. a recognised degree), Initial Professional Development (a set of Development Objectives must be achieved and formally recorded), and the Professional Review (submission of various documents including an Experience Report and a

Project Report, followed by an interview and written exam). CEng, IEng and CEnv may be applied for along with the Professional Review application, and are assessed concurrently. The most relevant points for hydrologists may be summarised as:

1. To become a Chartered Engineer via the ICE, candidates must (with exceptions) first have a Masters level degree accredited by the ICE. This would typically be an MEng in Civil Engineering, but may differ, for example an accredited BEng or BSc followed by an accredited MSc. The ICE holds a list of accredited degrees, and is willing to consider degrees not on its list. They may request 'top up' courses and require candidates to undergo an Academic Assessment;
2. Engineering experience can count in lieu of academic qualifications – in an extreme case candidates may not need a degree at all, but can expect to spend 10 years achieving equivalent experience, maybe more;
3. To become a Chartered Engineer the Development Objectives will include 'engineering principles' (technical and professional). Training and experience which is hydrological science, but not engineering, will not be sufficient. Some experience of construction sites will be required for anyone who has a position which might involve responsibility for designing civil works;
4. Candidates can become a Member of the ICE (MICE), but not a Chartered Engineer, with any Bachelors-level degree – this still requires experience of engineering principles. If the Bachelors degree is accredited then there is an option of becoming an Incorporated Engineer (IEng);
5. In Autumn 2006 there will be a new option – Associate Member of ICE (AMICE). This is designed to encourage professionals who are closely involved with civil engineers, such as hydrologists, to become affiliated. It requires a Professional Review based on technical or scientific principles;
6. MICE candidates can also apply to become a Chartered Environmentalist (CEnv) via the ICE, subject to the requirements of the Society for the Environment;
7. Members of professional institutions in EU countries can short-cut the procedure towards membership of the ICE (and other UK professional institutions);
8. There is no explicit 'research route' to MICE, but researchers may be able to meet the requirements.

Many employers run Approved Training Schemes, and will assign a Supervising Civil Engineer (i.e. a mentor) who is responsible for appraising whether an applicant is ready to sit the Professional Review, and for arranging opportunities to get the required Initial Professional Development (IPD).

For applicants who are not on an approved scheme, professional development is approached by Self Managed Training and Experience – and the ICE will do a Career Appraisal to assess whether or not the applicant is ready for the Professional Review. If this appraisal is positive the applicant can apply immediately to take the Professional Review, which involves submission of training reports, an interview and writing two essays under exam conditions. If not, the feedback will provide recommendations for additional experience and training.

## 4.2 Chartered Institution of Water and Environmental Management

The Chartered Institution of Water and Environmental Management (CIWEM) was formed in 1987 from several predecessor institutions dating back to 1895 and was granted a Royal Charter in 1995. This means that it can directly grant the status of Chartered Water and Environmental Manager which allows the use of the letters MCIWEM.

There are seven classes of CIWEM membership: environmental partner, student, affiliate, associate, graduate, member and fellow. To become a full member and get Chartered status of MCIWEM, candidates must be at least 25 years of age, have an accredited honours degree plus 4 years' relevant experience, and pass a Professional Review which assesses whether they have achieved CIWEM's 10 Mandatory Competences through the submission of written reports and a face-to-face interview.

There are 3 stages to becoming MCIWEM:

1. Submit completed application form and Mandatory Competence form showing how experience meets CIWEM's requirements. Details of academic course modules together with a list of training courses and professional meetings (especially CIWEM meetings) attended also need to be submitted;
2. Submit a Career Report (1500-2000 words) and a Project Report (2500-4000 words based on 2-5 projects). Examples of "projects" could be the installation of a gauging station, development of a rainfall-runoff model, the development of a new technique/method. A good "project" would display all stages from identification of a need, through testing and option appraisal to implementation of the preferred solution – this should ensure that a wide range of the Mandatory Competences are picked up. In the reports it is important to illustrate professional competency as well as technical competency, and cross-reference to the Mandatory Competences. Appendices can be used to include supporting information such as photos, diagrams and tables of data;
3. A professional interview (typically 40-60 minutes and held in London) including a short (<7mins) technical presentation, a review of the project report and the achievement of the Mandatory Competences. There will be either two or three interviewers and at least one will share the applicant's area of expertise. An awareness of current topical environmental issues is useful.

The whole process typically takes around 12 months to complete.

Applicants can achieve the Mandatory Competences either through a formal training scheme with a mentor (who does not need to be a CIWEM member), or by individual achievement of competences and recording of experience.

Candidates need two sponsors who should be CIWEM members (or, exceptionally, a Chartered member of an equivalent body). Local branches will help find a CIWEM member if this is a problem. The sponsor/supervisor/mentor has to sign the Mandatory Competence forms and validate the Project Report to confirm that it represents the candidate's work. A supervisor needs to be familiar with the candidate's work e.g. a line manager or project manager. A mentor is someone who helps the applicant with guidance through the chartership process and ensures that the required skills and attributes are developed. It is often fruitful to have a mentor who is influential, but not a line manager, so that conflicting interests in work programmes are avoided.

When applying for full membership (MCIWEM), applicants are invited to apply for registration as a Chartered Engineer (CEng), Chartered Environmentalist (CEnv) or Chartered Scientist (CSci). If approved by a Professional Board who review the application, the candidate's eligibility will be assessed during the Professional Review, based on the requirements of the appropriate Society/Council as well as those of CIWEM. If an applicant asks to be considered for chartership through one or more of the Councils at the same time as membership of CIWEM then failure to meet the competences of any one of them will result in failure of all. The reasoning is that the competences for them are all aligned so if an applicant fails to meet them for one chartership they will not have been met for the other(s). CIWEM helps to guard against this happening by carefully vetting all applications at the first stage.

An ongoing requirement of being MCIWEM is to maintain Continuing Professional Development (CPD) and to keep a record of this. CPD records can be called upon at any time. CIWEM requires 5 days (6 hours/day) of CPD per year.

CIWEM also run a certificate and diploma programme to provide appropriate, practical underpinning knowledge for practitioners working in the environmental sector. They can be used as a method of attaining post-graduate qualifications, leading to an MSc, or as a means of providing professional development. The course is in two parts. Part I, the Certificate, provides a common platform of underpinning knowledge at post-graduate level in the basics of water and environmental management. Part II, the Diploma, provides specialist knowledge to post graduate diploma level in a range of carefully chosen options. Anglia Ruskin University, Liverpool John Moores University, the University of Abertay and Bristol University offer courses leading to the Certificate and Diploma.

### **4.3 Royal Meteorological Society**

To become a Chartered Meteorologist (CMet), candidates need to be Fellows of the RMetS (FRMetS). To achieve this, they need to have an honours degree in science or engineering, and 5 years' relevant experience (e.g. as a hydrologist with meteorological interest). Sometimes long experience can replace the academic qualification requirement. The review for becoming CMet includes assessment of examples of written work and experience, recommendations from 3 referees (one of whom if possible should be CMet) and then an interview. The Accreditation Board then makes a recommendation to Council.

As with the other institutions, communication and professional skills are important requirements. Formal written reports, as required by ICE and CIWEM, are not required by RMetS. Extensive knowledge of meteorology is not necessary but it is necessary to have a good knowledge of basic meteorology and the meteorological aspects of hydrology (e.g. precipitation types and processes), and therefore a drainage or dam engineer might struggle. The failure rate for first-time applicants is about 30%.

A particular feature of the CMet qualification is that it is reviewed annually, and Continuing Professional Development (CPD) has to be reported every two years for scrutiny by the Accreditation Board. If the CPD is deemed not to have been acceptable then the candidate will be asked to improve it, or risk being struck off.

CEnv status can also be achieved via RMetS – exactly the same procedure is followed, except that the Accreditation Board makes its recommendation based on the Society for the Environment's criteria. There are presently about 5 hydrologists who hold the qualification which is recognised formally in the EU and also accepted in Asia, USA and Australasia.

#### **4.4 Institution of Water Officers**

The Institution of Water Officers (IWO) is of a similar size and nature to BHS. IWO's members are mainly water industry employees, including water utility companies, suppliers, consultants and regulators. IWO does not have a Royal Charter and therefore cannot directly grant Chartered status, however candidates can apply to be a Corporate Member of IWO which allows the use of the designatory letters MIWO. When applying for MIWO, candidates can also apply for registration as a Chartered Engineer (CEng), Incorporated Engineer (IEng), Engineering Technician (EngTech) and Chartered Environmentalist (CEnv). IWO's key strength is the networking opportunities it offers its members. It also has a quarterly magazine and is organised into regional branches.

There are 2 classes of IWO membership: Corporate and Associate. Anyone in the water or associated industries can be an Associate member – it just requires the completion of a simple application form (available on IWO's website). To become a Corporate Member (MIWO) applicants must be at least 21 years of age, have a satisfactory education base (BTEC minimum or equivalent) plus 3 years relevant experience. There is also a mature candidate route for those without formal qualifications. Applicants have to prove their attainment of IWO's key competence through a Professional Review (written report and interview).

The IWO competences are grouped into 4 areas:

- (a) Knowledge & understanding to apply technology
- (b) Application to practice
- (c) Leadership & supervision
- (d) Interpersonal skills

There are 3 stages to getting MIWO:

1. Submit completed application form to IWO (available on IWO's website);
2. Submit a Career Report illustrating professional and technical competency, and cross-referencing to the IWO competences. The report should include a personal development action plan;
3. A professional interview (typically 30 minutes and held locally).

The whole process typically takes around 6 months to complete.

To become Chartered via IWO, the additional criteria of the Engineering Council (for CEng) or the Society for the Environment (for CEnv) must be demonstrated at the Professional Review.

#### **4.5 Royal Geographical Society**

Anyone can be a Member of the Royal Geographical Society (RGS), and anyone working in the field of geography can be a Fellow. The professional qualification of Chartered Geographer (CGeog) can be applied for along with a Fellowship application. The requirements are a recognised geographical-orientated degree, plus 6-8 years' working experience, or 15 years of practical experience for those without a degree, and continued involvement in CPD activities. There is, at present, no interview – the review is based on a written application including a 1000-word professional self-evaluation. BHS has

some Chartered Geographers. 60% of Chartered Geographers are academics – it has never previously been pushed to non-academics.

## 5 Conclusions

1. Chartership has obvious benefits – it is an internationally recognised statement of professional competence and reputation, it stands out on a CV and improves promotion prospects. Many advertised jobs are restricted to candidates who are Chartered;
2. There are currently six Chartered status options relevant to hydrologists practising in the UK: CEng, CEnv, CSci, CMet, CGeog and MCIWEM;
3. CEng is generally not an option for hydrologists without a MEng or BEng/MSc degree;
4. The ICE is encouraging hydrologists to join as Associate Members (AMICE), but this will not lead to CEng or IEng status;
5. To apply for chartership the applicant needs to document training and work experience, ideally signed by a supervisor (this can be anyone who knows what the applicant has done). Ultimately it will be up to the Professional Review panel to decide if achievement of the relevant competences required for Chartered status has been demonstrated, but it helps the members of the panel to make a judgement if the record has been signed for and can be verified;
6. It is the responsibility of applicants to ensure that they have sufficient experience to demonstrate the achievement of the required competencies but it is useful to have a mentor to assist with review and suggest opportunities for fulfilling the requirements. It is often fruitful to have a mentor who is influential, but not an immediate line manager, so conflicting interests in work programmes are avoided;
7. Sitting the Professional Review without having the required experience and knowledge is not recommended, as the assessors are efficient at identifying weak candidates. It is recommended that candidates are honest about their competences and know their own limitations;
8. There may be an opportunity in the future for BHS to develop a chartership explicitly for Hydrologists (CHyd?). However such a chartership would involve membership fees being increased to fund aspects such as the Professional Review and the associated administration. The extent of increase is not known, but some idea can be gained by reviewing membership fees for other organisations. For example, IWO which is a similarly sized organisation to BHS and which offers chartership via CEnv and CEng but does not have its own chartered status, has membership fees of £70/yr. The Royal Meteorological Society which has its own chartership (CMet) charges a £133 application fee and £56/yr membership fee (as at 2006). For BHS to have its own chartership it would need to gain a Royal Charter. The BHS committee will be investigating the opportunities for chartership explicitly for hydrologists in the future.

## **Appendix A: Summary of Current Fees (2006)**

### **A.1 Institution of Civil Engineers (ICE)**

- £225 Chartered Professional Review fee
- £240 Joining fee
- £210/yr subscription (Member)

### **A.2 Chartered Institution of Water and Environmental Management (CIWEM)**

- £125 application fee (£60 for students)
- £205 Professional Review fee
- £190/yr MCIWEM membership fee
- £31/yr management fee for CEnv, CSci, CEng (not more than one fee per individual)

### **A.3 Institution of Water Officers (IWO)**

- £30 application fee including first year's subscription
- £70/yr MIWO membership fee (£60/yr for Associate)

### **A.4 Engineering Council (for CEng)**

- £25/yr membership fee

### **A.5 Society for the Environment (for CEnv)**

- One-off registration fee of £50
- £25/yr membership fee

### **A.6 The Science Council (for CSci)**

- £15/yr membership fee

### **A.7 Royal Meteorological Society (RMetS, for CMet)**

- £133 CMet Application Fee
- £56/yr membership fee (Fellow of RMetS)

### **A.8 Royal Geographical Society (RGS, for CGeog)**

- £75 joining fee (Fellow of RGS)
- £50 CGeog application fee
- £20/yr membership fee (CGeog)

## Appendix B: Further Information Sources

|                                 |  |
|---------------------------------|--|
| ICE                             | <a href="http://www.ice.org.uk">www.ice.org.uk</a>                 |
| CIWEM                           | <a href="http://www.ciwem.org">www.ciwem.org</a>                   |
| RMetS                           | <a href="http://www.rmets.org">www.rmets.org</a>                   |
| IWO                             | <a href="http://www.iwo.org.uk">www.iwo.org.uk</a>                 |
| RGS                             | <a href="http://www.rgs.org">www.rgs.org</a>                       |
| The Engineering Council         | <a href="http://www.engc.org.uk">www.engc.org.uk</a>               |
| The Science Council             | <a href="http://www.sciencecouncil.org">www.sciencecouncil.org</a> |
| The Society for the Environment | <a href="http://www.socenv.org.uk">www.socenv.org.uk</a>           |

## Appendix C: Glossary of Terms

|                  |  |
|------------------|--|
| AMICE            | Associate Member of the Institution of Civil Engineers (due to be introduced in Autumn 2006)   |
| CEng             | Chartered Engineer   |
| CEnv             | Chartered Environmentalist   |
| CGeog            | Chartered Geographer   |
| CIWEM            | The Chartered Institution of Water and Environmental Managers (awards MCIWEM directly plus CSci, CEnv, CEng, IEng, TechEng)  |
| CIWEM Mentor     | A mentor is someone who assists with guidance through the chartership process and ensures the development of the required skills and attributes. It is often fruitful to have a mentor who is influential, but not an immediate line manager, so conflicting interests in work programmes can be avoided |
| CIWEM Sponsor    | A CIWEM member, or exceptionally a Chartered member of an equivalent body, who countersigns the application form. If an applicant has a problem finding a CIWEM member then the local branch may be able to assist.  |
| CIWEM Supervisor | A supervisor who needs to be familiar with the applicant's work e.g. a line manager or project manager   |
| CMet             | Chartered Meteorologist  |
| CPD              | Continuous Professional Development is the systematic maintenance, improvement and broadening of knowledge and skill, and the development of personal qualities necessary for the execution of professional and technical duties throughout working life   |
| CSci             | Chartered Scientist  |
| EngTech          | Engineering Technician   |
| ICE              | The Institution of Civil Engineers (awards MICE plus CEng, IEng, EngTech)  |
| IEng             | Incorporated Engineer  |
| IPD              | Initial Professional Development i.e. pre-chartership  |
| IWO              | The Institution of Water Officers (awards MIWO plus CEng, IEng, TechEng, CEnv)   |
| MCIWEM           | Chartered Water & Environmental Manager  |
| MICE             | Member of the Institution of Civil Engineers   |
| RGS              | The Royal Geographical Society (awards CGeog)  |
| RMetS            | The Royal Meteorological Society (awards CMet)   |
| SocEnv           | The Society for the Environment (awards CEnv via constituent bodies)   |