Institute of Physics

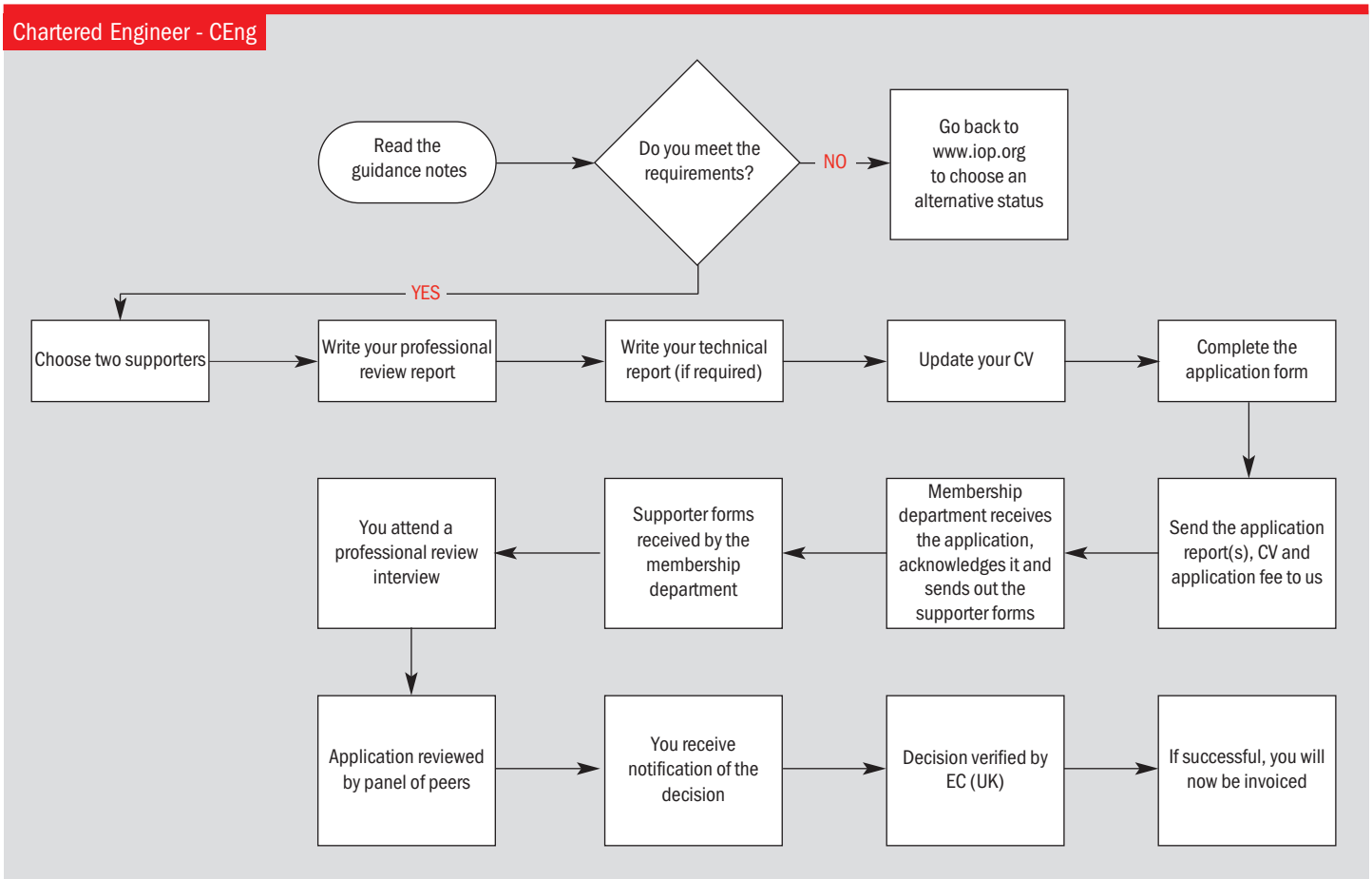
CHARTERED ENGINEER

Welcome to the Institute of Physics – the home of physics and physicists in the UK, Ireland and beyond.

Chartered Engineers are characterised by their ability to develop appropriate solutions to engineering problems, using new or existing technologies, through innovation, creativity and change. Many physicists move into engineering at some point in their careers and so the Institute of Physics is happy to offer CEng to its members.

To apply for CEng you will either need to already be a Member of the Institute or be ready to submit your Member application at the same time as this one. Member guidelines can be found at **www.iop.org** (How do I become a member? Member). In addition, if you would like to you can apply for more than one Chartered Status at a time. More details about CPhys and CSci can be found at the same web address.

The basic requirements are that you have a degree in physics or a related subject and have approximately five years work experience in engineering. If you have a BSc or no degree there is some additional paperwork required. This is explained in these guidelines and is straight forward to provide.



How long will my application take to be processed?

- The membership department will acknowledge receipt and send out your supporter forms within four weeks.
- We will interview you as soon as we can but this may take 2-3 months to arrange.
- You will receive a decision on your application within four weeks of your interview.

How long will my application take to write?

We find it takes people two to three hours to complete an application for any chartered status if they do it all in one sitting. You might find it easier to do half an hour a night for a week.

Whatever you do, don't spend all that time writing your application and then omit to send it in. The EC(UK) change the requirements every now and again so you don't want to find that when you do get round to posting it, it is no longer usable.

Choosing your supporters

Applications for CEng must have two supporters who are both chartered engineers. You are asked to choose these for yourself. Please consider the following when choosing your supporters:

- both supporters must be Chartered Engineers although they do not have to be chartered through or members of the Institute of Physics;
- one supporter should be outside your work place. The panel request this to ensure independence of opinion;
- both supporters should have known you (or known of you) for at least one year;
- remember that you must not be related to either of your supporters.

Further guidance on choosing your supporters can be found online at **www.iop.org** (How do I become a member? Chartered Engineer).

Educational requirements

Before you begin your application it is worth checking that you meet one of the following criteria:

- you have an accredited BSc in physics or a related subject;
- you have an accredited degree in engineering.

It is very unusual for the Institute to receive applications from people with engineering degrees so we are very used to guiding people with physics degrees towards Chartered Engineer. Anyone without an accredited MEng degree needs to show MEng Equivalence. At first this can seem rather daunting but in fact is simple to do. This is explained in more detail below.

The database of accredited physics degrees for UK and Ireland can be found from this page: **www.iop.org** (How do I become a member? Chartered Engineer).

If you have a degree from outside the UK or Ireland you can ask the Institute to compare it to UK degrees using an international database, found at **www.naric.org.uk**. The Institute subscribes to this well-respected database and uses it to judge the level of your qualification.

If you have no degree (or your degree is unaccredited) but have more than eight years experience in engineering, go to **www.iop.org** (How do I become a member? Chartered Engineer) for more information.

How do I show MEng equivalence?

All candidates without an accredited MEng degree, even those very senior in the engineering community, need to demonstrate MEng equivalence. Assessment of MEng equivalence is done on an individual case basis, and although it may at first sight appear daunting, it has already been shown that large numbers of physicists working as engineers are able to demonstrate MEng equivalence with little difficulty.

To demonstrate MEng equivalence, those with degrees in physics need to show that they have "otherwise compensated for the vocational engineering aspects of a BEng deficient in a physics degree, and for the 'enhanced and extended' engineering education embodied in the final year of an accredited MEng degree". Unfortunately a PhD or MSc in physics or engineering does not automatically fulfil this requirement.

There are several ways in which this can be achieved. Some organisations have staff completing what was known as a "Matching Section" under the previous edition of CEng guidelines. Some people choose to take the EC(UK) examinations, details of which can be found at **www.city-and-guilds.co.uk**. However, the route we recommend is known as the "Technical Report Route". The Institute piloted this route for EC(UK) and we are now very good at guiding our members towards Chartered Engineer in this way.

Technical report route

These are the main features identified to be missing from a physics degree that need to be accounted for in the technical report:

- vocational aspects of an engineering degree. For most of our members this will be gained naturally during the responsible experience period;
- in-depth study in a field of engineering (corresponding to the enhanced and extended part of the MEng). For most members this is likely to occur naturally as part of the employment;
- individual and group project work. Some credit may be taken for project work on an MSc or a PhD. However, these must be engineering projects. Again these are likely to occur naturally as part of employment in engineering;
- business studies including budgeting and management accounting, financial accounting (balance sheets, profit and loss accounts), management (people, projects, budgets) and commercial awareness (preferably including some knowledge of marketing). As with the three points above we would expect some experience of this to be gained during the responsible experience period. It is also possible that some experience will be from formal courses, provided by or through your employer. In addition you might gain experience through private study.

The technical report must cover engineering projects. We expect you to be able to base your report on reports or publications written as part of your employment. It has to cover work of a professional standard worthy of a Chartered Engineer. We understand there are often issues to do with commercial awareness and so on so we understand reports may need to be censored to remove areas of particular sensitivity.

It is very important that you emphasise the engineering applications and the design elements of your work. The report needs to substantiate your ability to undertake individual project work (although this may be part of a larger project) and to undertake group projects. A length of 5000 words is recommended for this the main section of the report, or up to about 10 000 if the report consists of existing reports. Unfortunately we will have to return reports in excess of this length to you for editing, which will delay your application.

To help you we have designed a technical report template (Masters equivalence report) which can be found towards the end of these guidelines. It is not compulsory to use the template but this is the format the panel have requested it be in. An editable word version of this template can be downloaded from **www.iop.org** (How do I become a member? Chartered Engineer).

Where you are writing this report afresh, from the beginning, you will obviously be able to strongly emphasise your own role in projects. If you are using previously written reports and papers to make up the body of your technical review report you will probably need to write additional

'bridging' sections that emphasise your own role, especially in a group project. The Institute is happy to accept reports that consist of both previously published work and new passages mixed together.

We ask everyone to give at least one suitable referee (often your line manager or team leader), who may or may not be one of your supporters, able to endorse the authenticity of the report. Many people will need more than one referee, for instance where work was performed at different establishments and no single person is able to cover the whole of it. The referee(s) should sign the report and initial the parts they are able to vouch for. Unfortunately we will have to return reports that have not been initialled.

Three copies of the technical report need to be sent to the Institute of Physics with your application for CEng. We appreciate that the report may contain some confidential information. This confidentiality will be honoured and the technical report will not be photocopied or distributed externally. The technical report is discussed prior to the professional review interview and will therefore be seen by the two interviewers, the assessing panel and appropriate staff members only.

How many years work experience do I need?

There is no minimum amount of work experience but generally members of this Institute need a minimum of four or five years experience before they can apply for CEng. A number of candidates do not gain all the necessary skills within this minimum time so don't feel disappointed if it takes you a year or two longer.

Out of this total amount of work experience a minimum of two years has to be at a responsible level. The document "Guidance on responsible work experience" is in Appendix A. You can also download the document at the web address above.

Gaining experience

The EC(UK) have produced a list of 16 competence and commitment statements for CEng, which can be found at the end of this document. These have to be met during employment, ideally through participation in a company-training scheme accredited by this Institute or another engineering institution. However, it is recognised that many physics graduates become engineers gradually over a number of years without undertaking formal training or participating in a professional development scheme so do not worry if this does not apply to you.

We expect you to interpret these statements in the context of your job. While everyone has to satisfy each of the major headings A – E, we realise that within each heading you are likely to be stronger in some areas than others.

We ask that you demonstrate competence in a range of engineering work which has required exercise of your independent technical judgement, and some direct responsibility for resources, taking account of financial, commercial, safety, statutory and national considerations. Your experience needs to range across several aspects of design, construction, manufacture, operation or maintenance of products, systems or services. No potential Chartered Engineer is expected to cover this entire range although the interviewers will expect to see a balance in your application.

How do I prove I have these skills?

Some institutes ask you to present a portfolio of evidence when you apply for chartered status. We think that while you should definitely have a portfolio and should regularly record the skills you have learnt (rather than just the courses you might have been on) we don't need to see the whole thing – only a summary.

We ask every applicant to send us a professional review report. This report, explained in the next section, summarises and links your experiences to the competences for CEng. It also highlights how you have gained experience at a responsible level and provides us with a very accurate snapshot of your career at the time of application.

We do need to check the information provided, but rather than ask you for lots of counter-signatures we just ask you to choose two supporters who can verify the information you have given us.

Don't forget that two years of your experience has to be at a responsible level.

Your professional review report

All candidates have to complete one of these no matter how much experience they have. The report should be structured as follows:

- introduction - outlining your current role and its engineering content;
- initial Professional Development (IPD) – specifying the experience you have gained in the competence areas and how this experience relates to engineering (if this is not obvious);
- responsible experience – giving three examples of how you are using and applying your knowledge and skills to work as an engineer at a professional level. These examples must be spread over at least a two year period to prove you have been working at a responsible level for this period;
- continuing Professional Development (CPD) – detailing activities undertaken during your working life and outlining future career plans that will ensure you maintain your competence as an engineer/physicist working in engineering.

To help you write this report we have provided a template. You can download it as an editable word file from **www.iop.org** (How do I become a member? Chartered Engineer). You do not have to use the template but this is the format the assessing panel have asked reports to be submitted in so not using it might mean your application takes longer to assess. The word limit is 3000 words.

Candidates who have successfully completed a training scheme accredited for CEng do not need to include an IPD section in their report. Instead there should be a signed declaration from the candidate's line manager that the candidate has completed the accredited training scheme. In this case the total report length should be 800-1500 words.

If you are applying for more than one chartered status you will need to address different competencies and must write a separate professional review report for each application.

Attending your interview(s)

There is a separate document called "Preparing for your Chartered Engineer interview(s)". If you need to submit an MEng equivalence report you will also have an MEng interview. This will take 45 minutes and be carried out before your main interview. All candidates attend a professional review interview which takes 45-60 minutes. The majority of interviews take place in London but they can also be carried out via online or video conferencing. We also periodically arrange face-to-face interviews outside London.

How applications are assessed

Each application is peer reviewed by a panel of five of our members who are also Chartered Engineers. The panel assess the information in the application, the comments of the interviewers, and the comments of the supporters. These are then compared with the requirements for Chartered Engineer. The panel will choose to accept, reject or defer the application.

Occasionally applications are deferred to allow the candidate an opportunity to supply additional information. Other deferrals are generally due to insufficient responsible experience. Where an application is deferred or rejected the applicant will always receive a letter explaining the reason for this.

CEng competences

A. Use a combination of general and specialist engineering knowledge and understanding to optimise the application of existing and emerging technology.

A1 Maintain and extend a sound theoretical approach in enabling the introduction and exploitation of new and advancing technology and other relevant developments.
This could include an ability to:
- identify the limits of own personal knowledge and skills;
- strive to extend own technological capability;
- broaden and deepen own knowledge base through research and experimentation.

A2 Engage in the creative and innovative development of engineering technology and continuous improvement systems.
This could include an ability to:
- establish users' needs;
- assess marketing needs and contribute to marketing strategies;
- identify constraints and exploit opportunities for the development and transfer of technology within own chosen field;
- promote new applications when appropriate;
- secure the necessary intellectual property rights;
- develop and evaluate continuous improvement systems.

B. Apply appropriate theoretical and practical methods to the analysis and solution of engineering problems.

B1 Identify potential projects and opportunities.
This could include an ability to:
- explore the territory within own responsibility for new opportunities;
- review the potential for enhancing engineering products, processes, systems and services;
- use own knowledge of the employer 's position to assess the viability of opportunities.

B2 Conduct appropriate research, and undertake design and development of engineering solutions.
This could include an ability to:
- identify and agree appropriate research methodologies;
- assemble the necessary resources;
- carry out the necessary tests;
- collect, analyse and evaluate the relevant data;
- draft, present and agree design recommendations;
- undertake engineering design.

B3 Implement design solutions, and evaluate their effectiveness.
This could include an ability to:
- ensure that the application of the design results in the appropriate practical outcome;
- identify the required cost, quality, safety, reliability, appearance, fitness for purpose and environmental impact of the outcome;
- determine the criteria for evaluating the design solutions;
- evaluate the outcome against the original specification;
- actively learn from feedback on results to improve future design solutions and build best practice.

C. Provide technical and commercial leadership.

C1 Plan for effective project implementation.
This could include an ability to:
- identify the factors affecting the project implementation;
- lead on preparing and agreeing implementation plans and method statements;
- ensure that the necessary resources are secured and brief the project team.

Negotiate the necessary contractual arrangements with other stakeholders (client, subcontractors, suppliers, etc.).

C2 Plan, budget, organise, direct and control tasks, people and resources.
This could include an ability to:
- set up appropriate management systems;
- agree quality standards, programme and budget;
- organise and lead work teams, co-ordinating project activities;
- ensure that variations from quality standards, programme and budgets are identified, and that corrective action is taken;
- gather and evaluate feedback, and recommend improvements.

C3 Lead teams and develop staff to meet changing technical and managerial needs.
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;
- lead and support team and individual development;
- assess team and individual performance, and provide feedback.

C4 Bring about continuous improvement through quality management.
This could include an ability to:
- promote quality throughout the organisation and its customer and supplier networks;
- develop and maintain operations to meet quality standards;
- direct project evaluation and propose recommendations for improvement.

D. Demonstrate effective interpersonal skills.

D1 Communicate in English with others at all levels.
This could include an ability to:
- contribute to, chair and record meetings and discussions;
- prepare letters, documents and reports;
- exchange information and provide advice to technical and non-technical colleagues.

D2 Present and discuss proposals.
This could include an ability to:
- prepare and deliver appropriate presentations;
- lead and sustain debates with audiences;
- feed the results back to improve the proposals.

D3 Demonstrate personal and social skills.
This could include an ability to:
- know and manage own emotions, strengths and weaknesses;
- be aware of the needs and concerns of others;
- be confident and flexible in dealing with new and changing interpersonal situations;
- identify, agree and work towards collective goals;
- resolve conflicts and create, maintain and enhance productive working relationships.

E. Demonstrate a personal commitment to professional standards, recognising obligations to society, the profession and the environment.

E1 Comply with relevant codes of conduct.
This could include an ability to:
- comply with the rules of professional conduct of own professional body;
- work constructively within all relevant legislation and regulatory frameworks, including social and employment legislation.

E2 Manage and apply safe systems of work.
This could include an ability to:
- identify and take responsibility for own obligations for health, safety and welfare issues;
- ensure that systems satisfy health, safety and welfare requirements
- develop and implement appropriate hazard identification and risk management systems;
- manage, evaluate and improve these systems.

E3 Undertake engineering activities in a way that contributes to sustainable development.
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 encourage stakeholder involvement.

E4 Carry out continuing professional development necessary to maintain and enhance competence in own area of practice.
This could include an ability to:
- undertake reviews of own development needs;
- prepare action plans to meet personal and organisational objectives;
- carry out planned (and unplanned) CPD activities;
- maintain evidence of competence development;
- evaluate CPD outcomes against the action plans;
- assist others with their own CPD.

How to apply

All candidates must submit three copies of:
- application form;
- CV;
- degree certificates (please do not send the originals);
- organisational chart;
- professional review report (see above);
- MEng equivalence report where necessary (see above).

Unfortunately we will have to return incomplete or overlong applications to you.

There is an application fee for Chartered Engineer which goes part of the way towards covering the administration of the interview. This is £150 and should be submitted with the application. Unfortunately there are no concessions available and no application can be accepted without this fee. Cheques should be made payable to "The Institute of Physics".

Subscription fees for 2007

GRADE	Years in paid employment	Fee
Fellow	n/a	£112
Member	9+	£83
	7–8	£63
	5–6	£50
	3–4	£33
	1–2	£24
Other grades studying physics or a related subject [1]	n/a	£13
Part-time employment AND income greater than £10 000 p.a. – all grades	n/a	£41
Income less than £10 000 p.a.	n/a	£13
CEng registration fee p.a. (passed to EC (UK) in full)	n/a	£25
CPhys registration fee p.a.	n/a	£15
CSci registration fee p.a. (passed to Science Council in full)	n/a	£15

REMISSION [2] *(applies to subscription rates only)*
Retired: 55-60 (all grades) -25%
Retired: 60+ (all grades) £41
Retired: 70+ (all grades) £0

RECIPROCAL AGREEMENTS [2]
Royal Astronomical Society Fellows, members of the Royal Meteorological Society and members of the Institute of Physics and Engineering in Medicine may reduce their membership subscription rate by 25% *(please indicate RAS/RMetS/IPEM on application form).*

Contact details

Please send your application to:
Membership Department
The Institute of Physics
76 Portland Place
London
W1B 1NT
United Kingdom

If you have any questions
- either telephone: +44 (0) 20 7470 4800
- or e-mail: ceng@iop.org

[1] *To claim the Studying rate (other grades) the "present course of study" section on the reverse of the application form must be completed.*
[2] *Only one reduction may be claimed – one reciprocal agreement or remission.*