

# Technical Report guidance



How to write a technical  
report for your application to  
Chartered Chemical Engineer



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## How to write a technical report for your application to Chartered Chemical Engineer

### Demonstrating knowledge and understanding

The technical report is a means of demonstrating your knowledge and understanding of chemical engineering principles at the appropriate academic level, in lieu of holding an appropriate degree accredited by IChemE. It also allows you to show that you can effectively use these principles to tackle a "technical problem" of your choice. This problem is typically taken from a design or operating context when working in commercial practice or from academic work described in peer reviewed papers.

The subject of the report is left open for you to choose. You do not have to undertake a new piece of work - typically it will be based on a chemical engineering project you have completed recently, as you will be required to expand on the detail and context of the report at interview.

You must ensure that the report includes an explanation of the chemical engineering principles you have applied and is not simply a commentary or description of the work completed.

If you have been advised by an IChemE staff member to focus your technical report on design, please read the guidance specific to design technical reports.

### Academic Level

The appropriate academic level for Chartered Member is a master's ("M-level") degree accredited by IChemE. The knowledge and understanding required at M-level is of a broader and deeper nature, and the types of problems tackled are more complex and unstructured than are required for a bachelor's ("B-level") degree. In simple terms, M-Level provides the depth and B-Level the breadth of knowledge and understanding of chemical engineering.

Candidates required to complete a technical report typically hold an accredited B-level degree, an unaccredited B- or M-level degree or a degree in a cognate discipline, such as chemistry, physics, maths or another engineering subject. The technical report allows you to prove that your academic understanding of chemical engineering is at M-level as a result of having gained the necessary additional knowledge, understanding and skills required over and above those gained in obtaining your earlier academic attainments.

Please remember that the sole purpose of your technical report is to provide evidence that your knowledge and understanding of chemical engineering principles is at least at the minimum academic level required for a Chartered Member (this is defined in Appendix A of the Accreditation of Chemical Engineering Programmes guidance document).

## Technical report – things to note:

- your technical report is not a review of your training, employment or project experience, nor is it of your managerial or organisational competency. These are matters for your Competence and Commitment report
- your technical report must be in English and should be prepared and edited to a professional standard. However, where English is not your first language, IChemE assessors and interviewers are sympathetic to minor errors in syntax, grammar, etc. Nevertheless, please use spell and grammar checking software carefully and ensure your meaning is always clear. It is also beneficial to ask someone else to review it before submitting it to IChemE
- your technical report, including any appendices, should be a maximum of 5,000 words. Reports which exceed this count will not be assessed and the candidate will be requested to resubmit the report in a more concise form
- when submitting your technical report, please also complete the Technical Report Cover Sheet; by doing so, you assure yourself that you have covered all the required elements, and enable the assessor to locate the key elements within your report.

## Technical report: general guidance on topic

More detailed information for choosing a suitable technical problem is given in the "Detailed guidance on topic and scope" section below. Note the following:

- your choice of 'technical problem' should be one which you have either tackled yourself or one in which you've had a major role
- it's best to use a different topic for your technical report as that/those which feature in your Competence and Commitment Report, to show a wider range of experience across the two reports
- if you have internal documents, reports or published work available, you can cut and paste appropriate parts of these documents into your technical report providing you have personally done the work, and you have written them yourself
- you can also take a published paper and summarise/augment this to cover all the key areas within the scope section below. If others were involved in the work and/or in writing the paper, you must give these as references and explain your contribution
- you can also quote from text books, websites or other published or internal documents, but again you must give appropriate references and make it clear why you are using them. Such passages should be used only to enhance your report but cannot be regarded as a substitute for demonstrating your own academic knowledge. Simply padding out the technical report with copied text provides no benefit.

## Detailed guidance on topic and scope

### Topic

You need to choose an M-level topic for your technical report. The following three paragraphs should help guide you:

1. Typical B-level problems are often very straightforward in technical terms and often only need a single output as their solutions. In addition, work at B-level often uses standard methodologies which have been proved repeatedly in previous work tasks. This sort of work is important and necessary in many projects but is not of sufficient technical depth for your technical report.
2. By contrast, M-level tasks are often much less well-defined so the underlying technical issues need to be analysed and quantified before the main technical work can start. In addition, M-level work needs a deeper and broader application of underlying chemical engineering principles and often involves addressing problems where two or more variables interact. Finding solutions to such complex problems may require you to apply your knowledge in a way that has not been previously prescribed as there may be no well-defined procedures/techniques for solving them. This is the type of problem you need to choose for your technical report.
3. Complex problems can also be based on a single chemical engineering principle, but it is far better to choose a problem from which you can draw out two or three different principles to cover. This allows you to show evidence of your knowledge and understanding of chemical engineering principles across a wider scope of engineering practice. Typical principles covered are mass transfer, heat transfer, materials flow, reaction engineering, thermodynamics, etc. Note that work priorities can dictate that you worked on different aspects of your problem on separate occasions. This does not matter so long as your report stands as a coherent whole.

## Scope and Layout

The following points explain how your report should be presented:

- your technical report should contain a contents page (including page numbers) for easy of reference by the assessor and interviewers
- an introductory section should set out the context of the technical problem area, and be no more than 10% of the whole report's length
- you should show your understanding of the subject of the report by showing how you analysed the situation to establish the technical problem to be solved
- you should then state how you identified the key technical issues, developed the key technical criteria to be addressed and specified the targets to be achieved in qualitative and quantitative terms.

The main body of the report should typically show the following:

- how you identified the key physical phenomena occurring and how you chose the appropriate methodology and equations to quantify the problem
- your knowledge and understanding of the specifics of the equations, including their range of applicability, the impact of the various terms and how the accuracy of the inputs affects the output
- your worked examples of the methodology for key inputs to give appropriate outputs and, where appropriate, tables of the necessary results (tables can be included as an appendix if appropriate)
- how you checked whether the quantified outputs were "correct and appropriate", for example by comparing them with answers using short-cut methods and/or measurements from similar operating equipment and processes

- how you rationalised the various outputs to come to a conclusion and recommend a course of action to solve the problem, which met the criteria and targets you set out in the initial analysis.

### Other comments:

- if you have used your organisation's standard methodologies and/or computer methods to address the problem, you will still be expected to explain how and why you have used such methods with regards to the underlying chemical engineering principles, equations and methodology they employ. They should not be a substitute for your own knowledge nor to demonstrate how skilled you are in using such software.
- acronyms and sector or organisation specific terms must be defined, within the text of the report when first used and, for frequently used terms, in a glossary.
- diagrams, flowsheets, calculations, and extracts of computer outputs, etc. should be used where appropriate to augment the text.

## Attestation and Confirmation

The report should close with an attestation that the work is yours and be confirmed by the person(s) who supervised/managed this work, for example:

### Attestation

This report is a true account of work completed by me:

Author's name:.....Job title:.....

Author's signature:.....Date:.....

### Confirmation

I confirm that, to the best of my knowledge, the sections of this report noted below are a true account of the applicant's work.

Relevant sections confirmed:.....

Confirmer's name:.....Job title:.....

Confirmer's affiliation (company/university or other organisation):.....

Email address:.....

Relationship to the Author:.....

Confirmer's signature:.....Date:.....

Where the work presented in the report was supervised/managed by more than one person, confirmation should be given by each person, making it clear for which sections of the report they are providing confirmation.

## Technical report – assessment procedure

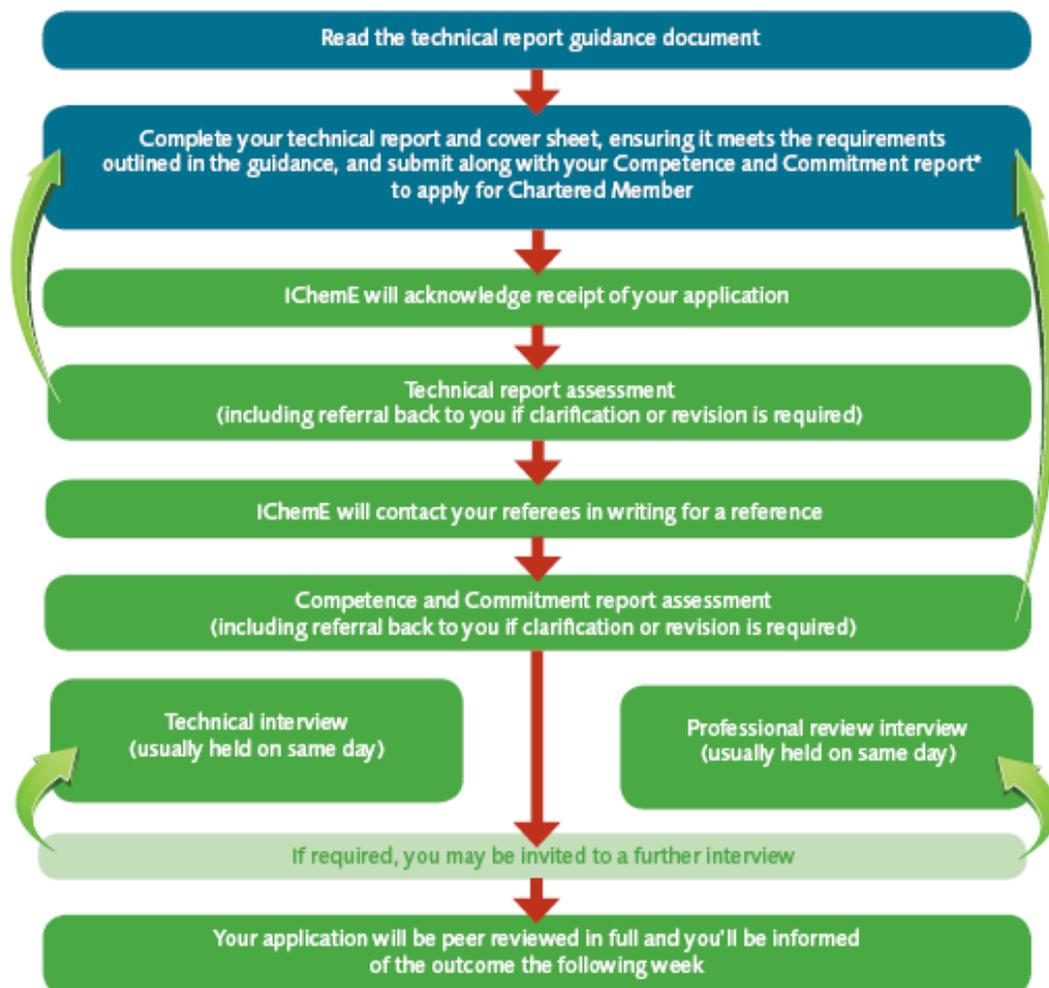
When your technical report is received by IChemE it will be sent to a trained assessor to decide whether it is suitable in topic, scope and content to proceed to interview. Should your report not meet these requirements, you will be given advice as to the deficiencies and asked to revise and resubmit it. Once satisfactory, a technical interview is carried out by two IChemE trained interviewers where you will be questioned in greater depth than the report's word count limit allowed you to do.

Your technical report assessors and interviewers are experienced in both professional chemical engineering work and in interviewing candidates for membership. They may not come from your industry or sector of professional practice, but they do understand chemical engineering principles, how they are applied in practice and the levels of knowledge and understanding required for the various grades of IChemE membership. Therefore, it is important to ensure that your report can be read and understood easily by someone who is not familiar with your industry, sector or topic.

It's your job - in writing the technical report and during the interview - to describe the knowledge and understanding you have gained in your academic studies and during your professional work, to demonstrate that you are able to practice as a chemical engineer with M-level academic knowledge and understanding. It is also your responsibility to explain how the items of your chosen topic, as carried out in your own work sector, relate to the underlying principles and unit operations which can apply across all chemical engineering work.

# Chartered Member (MIChemE)

## Review process for technical report



\* See our Competence and Commitment C&C report guidance document for further details

### Additional information

View past report examples at [www.icheme.org/chartered](http://www.icheme.org/chartered)

If you have any questions or need further information contact [members@icheme.org](mailto:members@icheme.org)

Led by members, supporting members,  
serving society

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