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Institution of Agricultural Engineers

**Guide to IAgrE Membership Grades**

## **G16 – Guidance for Candidates on Career learning Assessment Technical Report Option (TRO)**

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## Overview of the process for Technical Report Option (TRO)

1. Candidates who wish to be considered for Engineering Council registration are required to submit their applications and CV/Professional Development Report to the Institution. The Membership Secretary and/or Academic Qualifications Panel will assess if they have the exemplifying qualifications necessary for the level of registration requested and if so, they will be put forward for registration through Standard route as described in UK-SPEC. Otherwise, candidates need to be assessed by an individual route.
2. Members seeking registration with the Engineering Council (UK) who do not have the exemplifying qualifications suitable for that grade of registration requested will need to do so through the Individual route such as the Technical Report Option (TRO). This option is separate from, and in addition to, the standard routes to registration and is designed to provide a flexible and accessible route for registration.
3. If individual route is considered appropriate then Assessors are asked to carry out a career and professional development appraisal. The results of the appraisal will be discussed by Membership Committee, which will identify areas of shortfall and suggest ways that candidates may wish to meet them, e.g., further learning. If there is clear evidence that the candidate has sufficient engineering experience but not the formal qualifications then they are advised to consider the TRO. To accurately determine the extent of any shortfall it may be necessary to hold a preliminary career appraisal interview with the candidate at this stage.
4. If the Candidate is advised to undertake the TRO they will be advised about the areas that need to be addressed and asked to produce a Synopsis of their intended submission. The Synopsis is to be reviewed and approved by Membership Committee and a Mentor and Assessment panel is appointed.
5. Where appropriate, the candidate will be nominated a mentor to support them in the process of writing a Technical Report, advising on matters such as format and presentation.
6. The candidate then completes the Technical Report, which should typically be between 3,000 and 10,000 words. The length of report depends on the amount of knowledge that the candidate has to demonstrate in order to equate to those holding the exemplifying qualification. On submission the report has to be countersigned by the candidate's Mentor who will satisfy themselves that it is the work of the candidate.
7. The report is read by Assessors appointed by Membership Committee who have to identify that the candidate has the required knowledge and understanding necessary to underpin UK-SPEC competencies. If the report is received and approved by Membership Committee then the candidate is invited for a Technical Report Interview (TRI) conducted by the Assessors.

## Detailed Guidance

8. The Technical Report Option (TRO) is an option under the individual route to Engineering Council registration as defined in UK-SPEC.
9. If you lack the appropriate academic requirements for registration via the standard route but believe you have the required competence for Chartered or Incorporated status and have any of the following qualifications and a minimum experience (in years) as follows, you can apply via the Technical Report Option (TRO).

<b>CEng</b>	<ul style="list-style-type: none"> <li>• Accredited BEng (Hons) or an engineering or cognate degree with sufficient scientific basis of an equivalent standard – (indicative 6-7 years)</li> <li>• HND/HNC – (10 years; c) No appropriate qualifications (15 years)</li> </ul>
<b>IEng</b>	<ul style="list-style-type: none"> <li>• Accredited HND/HNC or equivalent – (5 years)</li> <li>• ND/NC – (10 years)</li> <li>• No appropriate qualifications – (15 years)</li> </ul>

### The TRO consists of four stages:

- An initial assessment
- A Synopsis of a proposed Technical Report
- A Technical Report
- A Technical Report Interview.

### Initial Assessment

10. As part of your application for Membership and/or registration you will be required to complete an application form for admission or transfer and send it to the Membership Secretary with a full and detailed CV/Professional Development Report and copies of any academic certificates. The Assessors will then advise you about the necessary shortfall to be demonstrated and you will then be asked to produce a synopsis of your proposed TR for approval by IAgrE.

### Synopsis

11. You will be required to complete a synopsis of your proposed Technical Report for approval by IAgrE. This must set out clearly how you intend to demonstrate your understanding of engineering principles with regard to some or all of the following:

- How you have developed a good level of experience in your particular fields.
- What technical judgement you have used when applying engineering principles and what is your ability to locate and use new research.
- What you have used by way of established analytical or design techniques to solve problem.
- Demonstrate you have the ability to apply methods that may be indeterminate or non-routine.
- This synopsis should be a maximum of 750 words in length and should indicate the planned structure of your Technical Report.

### Written Submission

12. If the Membership Committee have approved your Synopsis and appointed your Mentor then you can begin to complete your TR.

13. The purpose of this guidance is to suggest a shape and structure for the TR. The guidance is not mandatory, and you should discuss your draft with your mentor.
14. You may prepare your TR by selecting a project of some complexity, from your experience, in which you were deeply involved. The TR should be framed with an introduction, aim, discussion and evaluation.
15. The TR should be self-contained, and not rely on other papers unless they are provided in appendices and should flow logically from start to finish. It should be possible for an engineer to read a TR and understand it without prior specialist knowledge of the subject.
16. The TR may take a variety of forms but will generally fall into one or other of the following categories:
  - A collection of reports on design and/or construction projects. Confidential reports must be treated in total confidence.
  - A speciality paper based on a design or construction project(s).
  - A report on original work carried out by you.

**The Technical Report should demonstrate some or all of the following:**

- Use of mathematical calculations
  - Use of appropriate software to solve engineering problems
  - Use of modelling and statistical analysis
  - Evaluation of sustainability and fitness for purpose
  - Solution to practical problems
  - Selection of relevant materials, tools and processes
  - Appropriate application of technical knowledge and use of engineering principles
  - Analysis of the economic, social and environmental aspects of the work reported
17. The overall length of the TR will depend upon the amount of academic shortfall required to be demonstrated. The likely length of your report is between 3,000 and 10,000 words in total.
  18. Your Reviewers will focus on the quality rather than the quantity of the report and you are advised to be as concise as possible. You should remember that professional engineers should be skilled at technical report writing.
  19. Your submission must be typed, in English, and be signed by yourself and your mentor. You should submit three copies.

**Subdivisions of the Technical Report typically might be:**

a) Title	
b) Introduction	
c) What is the Technical Report about?	

d) Aim	<ul style="list-style-type: none"> <li>What is the aim of the project or investigation?</li> </ul>
e) Background	<ul style="list-style-type: none"> <li>Setting the scene. Where does the project lie in relation to the total picture? The context of the work.</li> </ul>
f) Technical Content/Description	<ul style="list-style-type: none"> <li>Draws out the fundamentals underlying the subject(s). Your report must not simply show the application of codes and standards but must illustrate your understanding and application of fundamental engineering principles. Appropriate mathematical analysis should be included. Diagrams or drawing should preferably be close to the relevant text.</li> </ul>
g) Conclusions	<ul style="list-style-type: none"> <li>In relation to the application of engineering principles, what were the successes and failures?</li> </ul>
h)	<ul style="list-style-type: none"> <li>What lessons have been learned? What evaluation criteria have you used to assess the success or failure of the project/subject being investigated? What further work might be required?</li> </ul>
i) Appendices	<ul style="list-style-type: none"> <li>For supporting detail, if appropriate. Explain where they have come from and how they are relevant.</li> </ul>
j) References	<ul style="list-style-type: none"> <li>It is likely that you will need to refer to standard engineering texts and research papers.</li> </ul>
k) Bibliography (If appropriate).	

## Technical Report Interview

20. Once your report has been submitted and accepted you will be invited to an interview where you will be asked to make a brief presentation of your report, followed by a question and answer session with your Assessors. The aim of the interview will be to test the depth of knowledge and understanding to compliment the written submission. The Assessors will be looking for evidence that you have the necessary underpinning knowledge and understanding for professional competence.
21. The interview will be kept as informal as possible and candidates will be given every opportunity to demonstrate their technical knowledge. Candidates should remember that it is their understanding of relevant engineering principles that is being tested. Assessors will not be influenced by accounts of exceptional experience, responsibility or eminence.
22. The Assessors will question the candidate to draw out evidence that the candidate has the necessary knowledge and understanding to underpin the UK-SPEC competencies, for CEng or IEng respectively, to the same level as their peers who followed the UK-SPEC standard academic pathway. If the Assessors are satisfied that the candidate has the necessary knowledge then the candidate will be invited to a Professional Review Interview (PRI), testing the candidate against the competency standards as laid down in the UK-SPEC. The TRI and PRI interviews may be held on the same day but should be recorded separately.

## Assessment Criteria

Your report will be assessed against the following criteria:

### **Knowledge**

- Engineering principles
- Appropriate application of a scientific approach
- Design concepts including solutions to problems
- Analytical methods and tools

### **Understanding**

- A feel for concepts and number capacities
- Application of technical standards
- Use of relevant engineering standards
- Knowledge of the limits of the given process/es
- Appropriate design methods including the use of IT

### **Abilities**

- Creativity and innovation
- Use of theoretical principles to solve problems
- Communication skills including Presentation and Technical Reporting

23. After a short break you will be told if your report is acceptable. If it is acceptable you will be invited to attend a Professional Review Interview for Member grade and/or Engineering Council (UK) registration.

