

Identifying Broadly-Defined Engineering Activity for Registration as a Professional Engineering Technologists at ECSA



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Broadly-defined engineering problems Introduction

- Before you start to complete your application you need to look ECOSA document R-02-STA-PE/PT/PCE/PN Page 13.
- This document states what is broadly-defined engineering problem:
 - “Require **coherent** and
 - Detailed engineering knowledge
 - Underpinning the applicable technology area”
- On page 14 of the same document:
 - “ Well-defined engineering problems are mainly solved by **practical engineering knowledge underpinned by related theory**”



What does broadly-defined engineering problem mean

- Coherent in the broadly- defined engineering problem to be logical, consistent and orderly.
- Detailed engineering knowledge is where you as the applicant discusses in detail your engineering knowledge at BTech Level.
- Underpinning your engineering knowledge and how you applied it at the BTech level.



Steps to test for broadly-defined engineering problem

- The recommended steps as per ECSA document page 13.
- The document recommends the four steps to follow to identify a broadly-defined engineering problem:

Step no. 1- Identification of the engineering problem

➤ **Question**

- You need to ask yourself – is the problem you identified an engineering problem.
- **The criteria to be used:**
 - Does the broadly-defined engineering problem adhere to the required coherent and detailed engineering knowledge underpinning the applicable technology area.



Steps to test for broadly-defined engineering problem (cont.)

Step no. 2 – Establish the level of complexity of identified problem

➤ **Question**

- You need to ask yourself the nature of the identified engineering problem and does it confirm to one or more of the required characteristic.

➤ **The criteria to be used:**

- Is the engineering problem ill-posed (has more than one solution), under or over specified and does it require the identification and refinement into the area of technology
- Does the engineering problem incorporate systems within the complex engineering systems.
- Does the engineering problem identified fall within the typical engineering requirements and can it be solved in a well accepted and innovative way.



Steps to test for broadly-defined engineering problem (cont.)

Step no. 3 – Complexity of the identified engineering problem

➤ **Question**

- You need to ask yourself what did you encounter in your problem investigation and analysis process?

➤ **The criteria to be used:**

- The problem can be solved with either or all through structural techniques, tools or methodologies
- Various standards, codes and procedures are to be applied to solve the problem and also if operating outside these standards and codes you must be able to justify.
- Your solution must have the required information abstracted from a variety sources that are complex, abstract or incomplete.
- You need also to define the needs taken into account inclusive of needs of sustainability of interested and affected parties .



Steps to test for broadly-defined engineering problem (cont.)

Step no. 4 – Level of decision- making and the potential consequences

➤ **Question**

- You need to ask yourself what was involved in the decision-making while analysing the identified engineering problem

➤ **The criteria to be used:**

- Can the engineering problem be practically solved with the required knowledge and judgment in decision making in your practise area and does the problem have the required consideration taken to interact with other areas
- Does the decision have any significant consequences that can be extended that are important in your practice area.



Required Competency Standards for a Technologist

The competency standards required for a Technologist.

- There are eleven outcomes the applicant is to adhere to before becoming eligible to register as a Professional Engineering Technologist.
- The competency is set out in five groups with each outcome required outcome to be achieved in these groups.

The groups are:

- Group A – Broadly-defined engineering problem (knowledge-based)
- Group B – Managing broadly-defined engineering activities
- Group C – Risk and impact mitigation
- Group D – Act ethically, exercise judgement and take responsibility
- Group E – Initial Professional Development



Required Competency Standards for a Technologist (cont.)

Group A

- Outcome 1 – Define, investigate and analyse the broadly-defined engineering problem
- Outcome 2 – Design or develop solutions for a broadly defined engineering problem
- Outcome 3 – Comprehend and apply knowledge which as either or all: principles, specialist knowledge, jurisdictional and local knowledge



Required Competency Standards for a Technologist (cont.)

Outcome B

- Outcome 4 – Manage part or all of one or more broadly-defined engineering activities
- Outcome 5 – Communicate clearly with others in the course of his/her engineering activity

Outcome C

- Outcome 6 – Recognises and addresses the reasonable foreseeable social, cultural and environmental effects of the broadly-defined engineering activities.
- Outcome 7 – Meet all legal and regulatory requirements and protect the health and safety of persons in the course of his/her broadly-defined engineering activity



Required Competency Standards for a Technologist (cont.)

Outcome D

- Outcome 8 – Conduct engineering activities ethically
- Outcome 9 – Exercise sound judgement in the course of broadly-defined engineering activity
- Outcome 10 – Be responsible for making decisions on part or all broadly-defined engineering activities

Outcome E

- Outcome 11 – Undertake professional development activities sufficiently to maintain and extend his/her competency.



Acknowledgement

This presentation is based on the Engineering Council of South Africa (ECSA):

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THANK YOU



The End

- *Any Questions??*