



Institution of Incorporated Engineers Sri Lanka

# Guidelines for the Membership Application Submission

SECTION A

# Introduction and Background

## **Introduction**

This guideline has been developed by the Institution of Incorporated Engineers Sri Lanka (IIESL) UAE branch in order to assist the prospective candidates in the application process for enrolling as

- Corporate member/ Incorporated Engineer
- Associate Member ; in the register of Institution of Incorporated Engineers Sri Lanka (IIESL).
- Associate

Shown below is a description of the engineering qualifications and the workplace role for each membership category.

### ***Incorporated Engineer/ Corporate Member***

Academic qualification for this category is a Sri Lankan three year engineering technology diploma conducted by an approved academic institution by the council of Institution following twelve years of schooling, or equivalent plus minimum of 10 years of post qualifying working experience.

The Corporate Member

- Focuses on interactions within the system
- Modifies and adapts established engineering practices
- Advances engineering technology.

### ***Associate Member***

Academic qualification for this category is an Sri Lankan three year engineering technology diploma following twelve years of schooling, or equivalent.

The Associate Member:

- Focuses on specific elements of the system
- Works within codes and applies established practices and procedures.

Further details on the general role descriptions for each occupational category and competencies required are presented in Section E.

### ***Associate***

Should be more than 35 years of age and being engaged in the practice of or associated with any discipline of engineering, and have attained a position of responsibility as an Engineer or by virtue of

connections with engineering or otherwise be qualified to concur with engineers in the advancement of the field of engineering.

## ***Student***

This category of membership is not available in International Branches of IIESL.

## **Pathways to Recognition**

There are two pathways to recognition of your qualifications:

- Through Accredited Engineering Qualifications (memberships)
- Through a Competency Demonstration.

The various successful pathways to recognition are shown schematically below:

### ***Accredited Qualifications***

These are the memberships of accredited overseas professional engineering bodies) that are recognised through formal agreements with engineering accreditation bodies in other countries. These qualifications are readily recognisable through database listings of accredited programs.

*For overseas qualifications there is only one pathway known as the Sydney Accord. At the moment Institution of Incorporated Engineers Sri Lanka (IIESL) is not signatory to the Sydney Accord. Therefore for the time being this category of applications will not be accepted. However IIESL is making every effort to be a signatory for Sydney Accord in the near future.*

### ***Competency Demonstration***

If you do not have membership of professional engineering bodies recognised through the agreements listed above you may seek recognition through a competency assessment process. This process consists with following;

1. Submission of Competency Demonstration Report (CDR)
2. Professional Review Examination. Professional review process will consist of a written examination on engineering management and a Viva based on the CDR.

The Competency Demonstrations Report (CDR) provides you with the opportunity to establish that your engineering knowledge and competencies are equivalent to those of the appropriate occupational category within the engineering team in Sri Lanka and Overseas. Those competency requirements are presented in **Section E** of this guideline.

This document guides you in determining your occupational category and preparing your CDR submission.

Section E of the document provides you with **Self-Assessment Charts** for each occupational category. You should refer to **Section A** above to initially determine in which occupational category you might apply. You should then turn to the relevant Self-Assessment Chart to see if you can demonstrate the required competency elements.

If you are satisfied that you have demonstrated all of the competency elements you may prepare your submission. If this is not the case you should undertake further study and/or workplace activity to develop the required competency elements before making your application.

**Section C** of the document provides detailed instructions on how to prepare your submission. A CDR Application Form is also available from the IIESL website (<http://www.iie.lk>) or upon request by e mail.

## **Certification of Copies of Documents**

Applications for competency assessments may get delayed if documents are not properly certified. The assessors will contact you by letter or email if there are any omissions in regard to certification. Please make sure your email and contact addresses are up to date.

Applicants should note the following points concerning certification of documents:

1. Certified copies of previously certified copies will not be accepted. You must provide a properly certified copy of the ORIGINAL document.
2. Proper certification will appear on each page to be certified, and should show:
  - (a) the signature of the person certifying the document
  - (b) The name of the person certifying the document. This should be clearly printed or evident in the official stamp.
  - (c) The address of the person who is certifying the document the phone number and if possible the email address of the person certifying the document.
  - (d) And where possible an official stamp indicating the status of the person certifying the document, Justice of the Peace, Commissioner for Oaths, Notary Public, or indicating the name of the law firm.

The following classes of persons are authorised to certify copies of documents:

- A current member of Institution of Incorporated Engineers other than at the grade of associate member or a student. The Membership number must be shown.
- A staff member of IIESL
- An officer of an Sri Lankan Diplomatic Post

- A Notary Public authorised in the country of application
- A Commissioner for Oaths (Declarations) authorised in the country of application
- A Solicitor, Barrister or Judge authorised in the country of application
- A Justice of the Peace authorised in the country of application

If you employ the services of a legal firm, the solicitor must sign each page. It will not be satisfactory for the name of the law firm to appear in lieu of the actual name and signature of the solicitor certifying your documents. Collective responsibility implied in the use of “we”, accompanied by the name of the law firm, is not acceptable.

## **Steps in the CDR Assessment Process**

The following sections in the guidelines will assist you to undertake the self-assessment and prepare your Competency Demonstration Report.

### ***Section B: Self-Assessment***

This part of the document guides you through a self-assessment process. By undertaking the self-assessment you can determine whether you have the necessary competencies to justify proceeding with your application. If you feel you have the necessary competencies you should proceed to **Section C** of the Document.

You should note however that a positive self-assessment is not a guarantee of success. Your application will be rigorously assessed on the basis of the information and evidence you provide.

### ***Section C: Compilation of a Competency Demonstration Report (CDR)***

This part of the Document provides you with guidelines for a description of your personal engineering practice and an identification of your engineering competencies.

This is known as the Competency Demonstration Report or CDR. It is the substantial component of your application which provides the basis for IIESL for assessment of your competencies. You should follow the guidelines in Section C carefully when compiling your CDR.

### ***Section D: Checklist of documentation and dispatch***

This section provides you with a checklist of the required material and dispatch address.

The assessment fee is specified on the CDR application form.

The steps in the assessment process are shown below.

### ***Section E: Self-Assessment Charts***

These charts allow you to determine your level of competency.

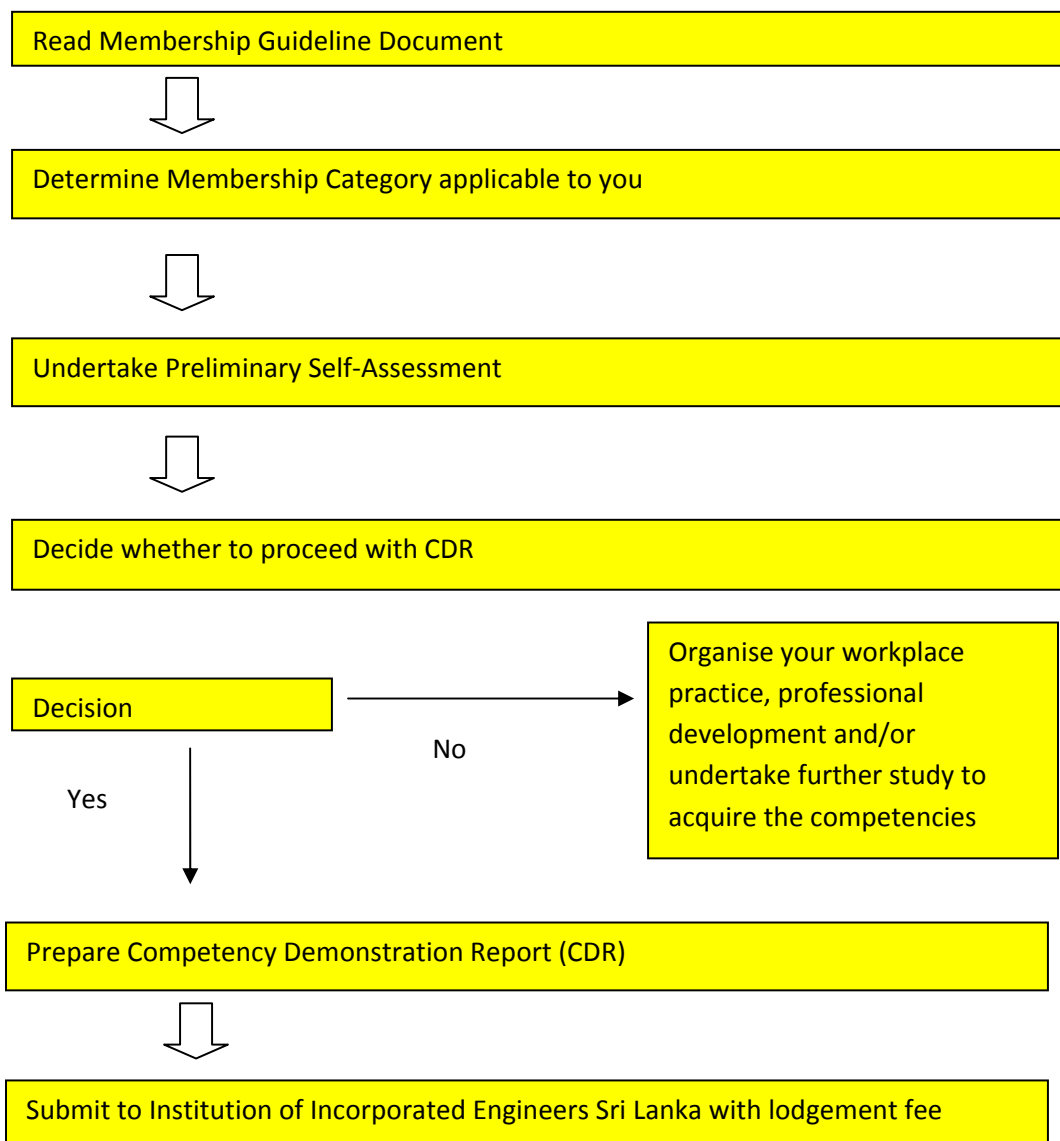
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## Section F: Application forms

You should complete the CDR application form provided. If you have appointed a person to act as your agent you must complete the authorisation form. This form may be found on the reverse of the application form or on the website (<http://www.iie.lk>). If there are any deficiencies in your submission you will be notified in writing. If the application is successful you will receive a letter of recognition suitable for migration purposes.

Please Note that assessment of your application will not proceed if you submit copies of documents where the class of person certifying the copy is not one of those listed above or where the requirements stated above are not complied with.

### Steps in the CDR Assessment Process



SECTION B

# Self-Assessment

## Introduction

The purpose of this Section is to enable you to determine whether you have the necessary competencies to proceed with your application for a formal CDR assessment. Before proceeding with your self-assessment you will need to determine which membership category in the IIESL you wish to be assessed against.

## Determination of a Membership Category

Re-read the Introduction (Section A Part 2) and familiarise yourself with the specified qualifications and experience required for enrolment in IIESL Membership categories. Further details of the role descriptions can be found in Section E. You should determine your most appropriate occupational category by considering both your engineering qualifications, experience and your workplace role.

## Institution of Incorporated Engineers Sri Lanka Competency Standards

IIESL has developed a set of Competency Standards for each membership category. These standards are at the Stage 1 or acquiring engineering Diploma level. This is the level for entry to practice in the profession. Competencies are expressed in terms of units, elements and indicators. The unit title describes a particular area of performance, and the elements are the necessary components or activities which make up that unit of competency. Each element has a set of indicators which describe ways in which the element would typically be demonstrated.

**The competency standards for each occupational category are shown in detail in Section E. The Section E should read in conjunction with Annex 1 of the document to for the applicable competency standards for the current year.**

## Using the Self-Assessment Charts

Self-Assessment Charts for each of the occupational categories are shown in **Section E**. Use the chart to make a self-assessment of your competencies in the occupational category for which you are seeking assessment. Carefully look at each of the three core competencies and their respective elements. If you feel that you have successfully demonstrated these competencies in your engineering practice then make notes in the comments column as to when, where (eg: the work site), and how you applied these competencies.

Note: these charts are for your personal use only. Do not submit these with your formal application for assessment.

Deciding whether to proceed if you can demonstrate that you have successfully applied all of the specified competencies you should now compile your Competency Demonstration Report (CDR).

Note: If you have completed the self-assessment and cannot demonstrate all of the competencies it is recommended that you do not proceed with the preparation of your CDR.

Instead you should take steps to develop the necessary competencies. You can do this by organising your professional work or by undertaking professional development programs and/or further study so that you acquire those competencies. When you feel that you have acquired the competencies at the required level of performance you should undertake another self assessment to decide whether to proceed with a formal assessment.

## SECTION C

# Compiling a Competency Demonstration Report (CDR)

## Introduction

This section deals with the compilation of a Competency Demonstration Report (CDR) describing your engineering practice. Do not proceed with this section unless you have completed the self-assessment in Section B and believe that you have demonstrated all of the relevant competency elements in your engineering education and/or workplace practice. The purpose of the CDR is to demonstrate:

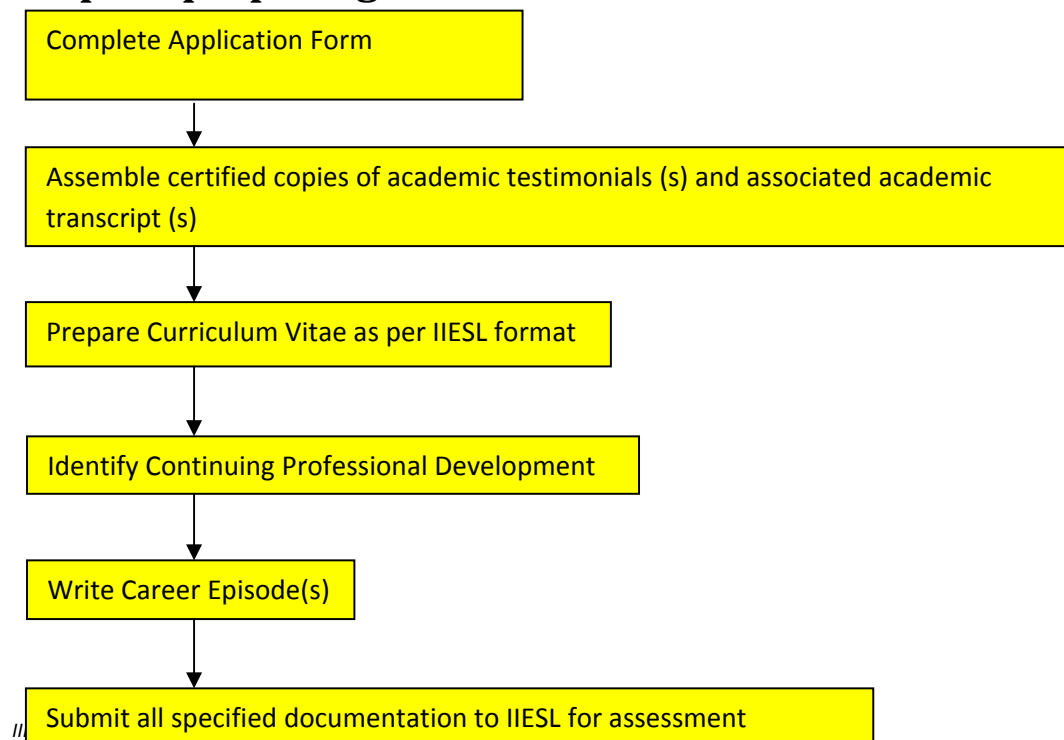
1. how you have applied your engineering knowledge and skills;
2. that such application meets the competency standards of the relevant to membership category of IIESL

You should note that the CDR must be all your own work. You must carefully follow the instructions provided in preparing your CDR. You should realise that you are entering into a final assessment. The major assessable features of the CDR are your narratives written in English of three career episodes and a Summary Statement of the competency elements you have claimed.

You should, where possible, type your CDR using a word processor and remember to keep a copy. The CDR must be **bound A4 format**. The CDR should be **typed in size 12 Times New Roman** font with **double spacing**. Documents not meeting the above standards will be returned for resubmission.

Your CDR will be assessed against the competency standards of the occupational category specified by you. IIESL will not assess your competencies against a membership category higher than the one you have specified.

### Steps in preparing a CDR:



## **Components of the CDR:**

You must first complete the CDR Application Form.

### **Cover Page**

Your Competency Demonstration Report must have a cover page with a standard passport size photo, your full name together with your sworn declaration (shown below).

### **Declaration:**

The following declaration must be signed and presented on the cover page:

‘All statements of fact in this report are true and correct and I have made claims of acquired competencies in good faith. The report is my own work and is a true representation of my personal competence in written English. I confirm that I understand that members of the Institution of Incorporated Engineers are required to display a commitment to exercising professional and ethical responsibility in all aspects of their work’.

Printed Name:

Signature:

Date:

Please Note; A submitted CDR which is incomplete when submitted or which does not meet the stated requirements will not be assessed.

All submitted material becomes the property of IIESL. Applicants must make copies of all documents sent to IIESL. Applicants who request photocopies and return of documents will be charged a AED75.00 administration fee.

### **Certified copies of qualifications and academic record(s)**

You must provide certified true copies of your original diploma and any other subsequent engineering qualifications together with their associated academic transcripts. For each qualification you must provide a certified copy of the academic qualifications and the academic transcripts (list of subjects studied and results obtained).

### **Certification of documents:**

Many applications for a skills assessment are delayed because documents are not properly certified. The assessors will contact you by letter or email if there are any omissions in regard to certification. Please make sure your email and contact addresses are up to date.

Applicants should note the instruction given in Section A concerning certification of documents:

Please Note: Assessment of your application will not proceed if you submit copies of documents where the class of person certifying the copy is not one of those listed above or where the requirements stated above are not complied with

## **Curriculum Vitae (CV)**

To gain a full perspective of your engineering workplace practice, IIESL requires a Summary

Statement of your employment history from graduation to date.

For each workplace provide:

- organisation name and location including contact details where possible
- dates and duration of employment clearly indicating no of years with the firm.
- title of position occupied by you
- your defined role (provide a duty statement where available) and/or a brief description of your activities
- Employer reference letter(s) must be provided if you have relevant work experience.
- Chronological order should be maintained. A record of an experience should not overlap with other records.

Your CV should be no more than three A4 pages excluding attachments.

## **Identification of Continuing Professional Development**

A brief summary of the Continuing Professional Development (CPD) you have undertaken during the three years preceding your application for assessment must be included in your CDR. This CPD may take the form of:

- short courses you have attended;
- formal post-graduate study;
- conferences at which you have delivered papers or attended.
- CDP conducted by any other professional organization/institution.

This should be no more than one A4 page.

## **Writing your career episode**

You are required to present a narrative of at least one or maximum of up to three of your career episodes to demonstrate your competences required for the eligibility of applied membership category..

A career episode is a documented component of your engineering education and/or work experience which captures a particular period or distinct aspect of your engineering activity. It may be:

- an engineering task undertaken as part of your educational program;
- a project you have worked on or are currently working on;
- a specific position that you occupied or currently occupy;
- a particular engineering problem that you were required to solve.

Each narrative must be in your own words (a minimum of 1000 words for each narrative) and must be written in English. The narrative, being written in your own words, will also provide evidence to the assessor of your communication skills.

The narrative should be written in a spontaneous way and not be artificially constructed around the competencies specified in the charts (Section E). Each narrative should emphasise any engineering problems identified and any particular problem solving techniques used by you. The purpose of this is to assess the nature of the contribution which you may have made to the engineering project or task - particularly if that contribution was of a novel nature or critical to the implementation of the task/project.

Please note that it is not sufficient to merely describe work in which you were involved. Your own role in the work must be clearly described by you, and be identifiable in the assessment.

You must number each paragraph in each of your career episodes. This is necessary to construct the Summary Statement. Each narrative should follow the format shown below:

### ***a) Introduction***

This introduces the reader to the narrative and should include such things as:

- the chronology - the dates and duration of this career episode;
- the geographical location where the experience was gained;
- the name of the organisation;
- the title of the position occupied by you.

This section would be about 50 words.

Please Note Career Episodes must be written in the first person singular clearly indicating your own personal role in the work described. Remember, it is what 'I did', not what 'we did' or what 'I was involved in.'

### ***b) Background***

This sets the scene and provides the context in which you were studying/working. It should include such things as:

- the nature of the overall engineering project;
- the objectives of the project;
- the nature of your particular work area;
- a chart of the organisational structure highlighting your position;
- a statement of your duties (provide an official duty statement where available).

This section would be about 200 - 500 words.

### ***c) Personal Workplace Activity***

This is the body of the narrative and the key assessable component. In this section you must describe in detail the actual work performed by you. It is not sufficient to describe the work performed by a team or group – your own role must be clearly identified. Remember it is your personal engineering competencies that are being assessed.

This section should include such things as:

- technical details of the work;
- how you applied your engineering knowledge and skills;
- the tasks delegated to you and how you went about accomplishing them;
- any particular technical difficulties/problems you encountered and how you solved them;
- strategies devised by you including any original or creative design work;
- how you worked with other team members.

This section would be about 500 - 1000 words.

### ***d) Summary***

This section sums up your impressions of the work and your role in it. It should include such things as:

- your view of the overall project;
- how the project fared in meeting the goals/requirements;
- how your personal role contributed to the project.

This section would be about 50 - 100 words.

## Preparation of the Summary Statement

Complete the 1-3 narratives then analyse them for the presence of the competency elements of the relevant membership category.

The results of your analysis are reported in the form of a Summary Statement of competency elements claimed. The Summary Statement cross-references the relevant set of competency elements with the particular paragraph in your Career Episode where each element occurs. Summary Statement must address all competency elements.

The Summary Statement must be presented in the form of a table identifying each competency element claimed, and indicating how and where it was applied. The Summary Statement must address all competency elements.

The numbering of the paragraphs in each career episode will allow you to construct the Summary Statement table by identifying the exact location in the narrative where evidence for the particular competency element can be found. e.g. paragraph 4 in Career Episode 1 would be CE1.4.

The required format for the matrix is shown below:

Summary Statement of Competencies Claimed		
Competency element	How and where demonstrated	Paragraph reference in Career Episode (CE)
Eg; CM 1.3 or AM 1.3	A brief description of how achievement of the element is demonstrated and where the (site/situation) applied to you	Identify relevant paragraph(s) where application of the element is demonstrated eg CE1.4, CE3.6, CE2.11

### *Please Note*

Do not address the indicators. Assessment is made on a holistic basis and it is not expected that every indicator will be met.

## **Assessment of the CDR**

Your CDR will be assessed to determine the presence of the competencies for the relevant occupational category. If it is found that the competencies you have demonstrated meet the IIESL Competency Standards you will be notified in writing to come for a viva in which verbal questions will be put to you on your episode.

Assessment of the current year applications will be based on competency requirements required for the year of application which is given in Annex 1 to the Section E. which will be revised each year by the by the Executive Committee of the IIESL UAE Branch assessing the degree of demonstration of competencies in the previous year.

# Section D

## Checklist and Dispatch

## CHECKLIST

Before you dispatch your CDR you should use this checklist to ensure that you have completed all the necessary steps and provided all the required documents. Assemble your submission by placing documents in the order shown below. Do not bind documents.

- Completed Application Form
- Application fee
- Identification document ( passport / national identity card issued by the country of citizenship)
- Certified true copies of academic testimonial(s)
- Certified true copies of academic transcript(s) – waiver can be requested for those who have qualification older than 10 years.
- Curriculum Vitae
- Employer reference letter(s)
- Continuing Professional Development record
- CDR Cover Page with full name, Passport style photo and signed declaration
- The Career Episode(s)
- Summary Statement of evidence for the competency elements

The assessment fee as specified on the Application Form must accompany your CDR.

Note: CDR assessments may take up to 10 weeks from the date of receipt. Please DO NOT contact IIESL within that time frame. Contact will cause delays to all applicants.

Section E

Competency Standards and Self-Assessment  
Charts

## **INCORPORATED ENGINEER OR CORPORATE MEMBER**

### **GENERAL DESCRIPTION OF ROLE**

Incorporated Engineers normally operate within a relatively well-defined technical environment, and undertake a wide range of functions and responsibilities. They are often specialists in the theory and practice of a particular branch of engineering technology or engineering-related technology, and in its application, adaptation and management in a variety of contexts. Their expertise lies in familiarity with its current state of development and its most recent applications. Within their specialist field, their expertise may be at a high level, and fully equivalent to that of a professional engineer; but they are not expected to exercise the same breadth of perspective as a professional engineer, but they are expected to carry the same wide-ranging responsibilities for stakeholder interactions, for system integration, and for synthesising overall approaches to complex situations and complex engineering problems.

The work of Incorporated Engineers combines the need for a strong grasp of practical situations and applications, with the intellectual challenge of keeping abreast of leading-edge developments in their particular field. For this purpose they need a strong understanding of scientific and engineering principles and a well-developed capacity for analysis. The work of technologists is most often concerned with applying current and emerging technologies, often in new contexts; or with the application of established principles in the development of new practice. They may also contribute to the advancement of particular technologies.

Some Incorporated Engineer qualifications include an emphasis on technical management as well as grounding in a particular area of technology. Technical management is seen as an appropriate field of specialisation in itself, and many technologists build their career paths in this direction. Examples of such specialisation include product development for manufacturing, manufacturing management, mine management, and management and maintenance of processing plants, complex building services, or testing laboratories.

Persons may also be recognised as Incorporated Engineers who hold degrees in fields related to engineering, and who have developed expertise and experience in applying their knowledge in conjunction with engineering work. Examples might be in geology and geo-techniques, information technology and software development, mining, biomedical technology, optical communications, renewable energy systems, agriculture, and so on.

The competencies of Incorporated Engineers equip them to approve and certify many technical operations such as calibration and testing regimes, compliance with performance-based criteria for fire safety, and design of components and sub-systems and of installations such as building services in circumstances that do not call for significant new development. Such certification should be fully acceptable in the public domain and should not require further endorsement by other practitioners perceived to be more highly qualified.

Incorporated Engineers may lead or manage teams appropriate to these activities. Some may establish their own companies or may move into senior management roles in engineering and related enterprises, employing professional engineers and other specialists where appropriate.

## **INCORPORATED ENGINEER (CORPORATE MEMBER) -UNITS AND ELEMENTS OF COMPCMENCY**

Units are numbered CM1, CM2 etc. Elements are numbered CM1.1, CM1.2 etc. Indicators are denoted by a, b, c etc.

### **CM1 KNOWLEDGE BASE**

#### **CM1.1 Knowledge of science and engineering fundamentals**

- a. Sound knowledge of mathematics to the level required for fluency in the techniques of analysis and synthesis that are relevant to a branch of engineering technology and its major areas of application, and to related technologies
- b. Sound basic knowledge of the physical sciences, life sciences, and/or information sciences
- c. underpinning the technology and related technologies, and appreciation of scientific method
- d. Strong grasp of the areas of engineering science that support the technology
- e. Ability to work from first principles in tackling technically challenging problems in the area of specialisation
- f. Appreciation of the future need to apply fundamental knowledge to ongoing developments in the technology and to new technologies relevant to the area of application

#### **CM1.2 In-depth knowledge and understanding of the technology and its applications**

- a. Knowledge of all aspects of an engineering technology and its major industrial, commercial and community applications; and/or of the technologies supporting a particular industry sector
- b. Competence in applying mathematics, science and engineering science to the analysis and solution of representative problems, situations and challenges in the technology and its utilisation
- c. Knowledge of relevant materials and resources and their main properties, and ability to select appropriate materials, resources and techniques for particular applications
- d. Ability to recognise results, calculations or proposals that may be ill-founded, identify the source and nature of the problem and take corrective action
- e. Awareness of current technical and professional practice, critical issues, and the current state of developments in the technology and its major areas of application

- f. Understanding of how new developments in the technology or its areas of application relate to established theory and practice, and to other technical areas with which they may interact
- g. Advanced knowledge in at least one area of application of the technology, to a level that engages with current developments in that area
- h. Ability to ensure that applications and extensions of the technology are soundly based in theory and fundamental principles
- i. Formal knowledge of the management of technical operations including business, financial, human resource, logistic, marketing, organisational, and procurement aspects, product and process development, and managed approaches to innovation

### **CM1.3 Techniques and resources**

- a. Familiarity with mathematical and physical modelling techniques relevant to the field of specialisation; ability to utilise these techniques for purposes of analysis and design, and understanding of their applicability and limitations
- b. Ability to characterise materials, devices and systems relevant to the field of specialisation
- c. Awareness of relevant current tools for analysis, simulation, synthesis and design, particularly computer-based tools and packages, and competence in their use
- d. Appreciation of the accuracy and limitations of such tools and the assumptions inherent in their use. Ability to verify the credibility of results achieved, preferably from first principles, to a reasonable approximation
- e. Proficiency in the range of laboratory and testing procedures relevant to the technology, and strong grasp of principles and practices of laboratory safety.
- f. Ability to design and conduct relevant experiments, devise appropriate measurements, analyse and interpret data and form reliable conclusions
- g. Ability to perceive possible sources of error, eliminate or compensate for them where possible, and quantify their significance to the conclusions drawn

Ability to construct and test representative components or sub-systems in a laboratory setting

### **CM1.4 General Knowledge**

- a. Educational background and/or general knowledge necessary to understand the place of engineering and technology in society

## **CM2 ENGINEERING ABILITY**

### **CM2.1 Ability to undertake problem identification, formulation, and solution**

- a. Within the relevant field of specialisation, ability to identify the nature of a technical problem, formulate an approach to its solution, make appropriate simplifying assumptions, and achieve a solution
- b. Ability to quantify the significance of the assumptions to the reliability of the solution and take further steps if necessary
- c. Ability to investigate a situation, or the behaviour of a system, and identify any underlying causes relevant to the field of specialisation
- d. Ability to recognise problems that have origins outside the area of specialisation and communicate them to an appropriately competent person

### **CM2.2 Ability to apply and adapt the technology**

- a. Knowledge of the factors likely to be important in particular areas of application of the technology, and ability to understand and manage them
- b. Ability to appreciate and manage the interactions between the technology and other parts of an overall technical system, define operating interfaces with other technologies, equipment or systems, and ensure that such interfaces function effectively
- c. Ability to adapt the technology to a variety of situations, understanding its properties, possibilities and limitations
- d. Ability to identify and solve effectively a wide variety of practical problems arising from application of the technology in different contexts

### **CM2.3 Proficiency in design of equipment or installations utilising the technology**

- a. Ability to design equipment or installations utilising the technology
- b. Experience in personally conducting a significant design exercise to achieve an engineering outcome to professional standards, demonstrating capacity to:
  - understand and document the required outcomes of a project or program utilising the technology
  - evaluate and confirm the appropriateness of the proposed use of the technology
  - develop and complete the design using appropriate engineering principles, resources, processes, codes and standards
  - specify the equipment and operating arrangements needed
  - quantify the engineering tasks needed to implement the design
  - devise and document tests to verify performance
  - if appropriate, produce technical manual for users of the equipment or installation

- c. Alternatively, experience as a member of a team conducting such a significant design exercise, and ability to demonstrate a key contribution to the team effort and the success of the outcome
- d. Ability to ensure that all proposals and designs emphasise safety, reliability, maintainability, cost effectiveness, product quality and value, and user friendliness

#### **CM2.4 Ability to conduct an engineering project**

- a. Experience in personally conducting and completing an engineering project appropriate to the field, to a high standard; or experience as a member of a team conducting and completing such a project, and ability to demonstrate a key contribution to the team effort and the success of the outcome
- b. Have produced at least one substantial report demonstrating mastery of the subject matter and ability to communicate complex material clearly

#### **CM2.5 Ability to ensure reliable operation**

- a. Thorough understanding of standards and codes of practice relating to the technology and its applications
- b. Understanding of the concept and processes of inspection and testing of equipment or installations which utilise the technology, identification of shortcomings, and where appropriate certification of compliance with standards and codes and/or performance-based criteria
- c. Where the technology is itself a medium for measuring or testing materials, components, or quantities, ability to conduct such measurements or tests and accept responsibility for accuracy and validity
- d. Understanding of fundamental properties and limitations of the technology and ability to identify circumstances that suggest a significant problem

#### **CM2.6 Responsibility as technical expert**

- a. Ability to communicate the significance of the technology and its use in a particular context, to other technical and non-technical stakeholders in a project or program
- b. Ability to identify, assess, communicate and manage technical risk associated with use of the technology
- c. Appreciate the interactions between technical systems and the social, cultural, environmental, economic and political context in which they operate; appreciate the imperative of sustainability, and approaches to developing and maintaining sustainable systems

#### **CM2.7 Capacity to contribute to advancement of technology**

- a. Appreciation of the evolving nature of technology and its applications

- b. Capacity to contribute to the advancement of technology and its adaptation to new applications or situations
- c. Readiness to apply fundamental knowledge to ongoing developments in technology, and to embrace new technologies relevant to the industry sector or field of application

### **CM2.8 Understanding of the business environment**

- a. Introductory knowledge of the conduct and management of engineering enterprises and of the structure and capabilities of the engineering workforce
- b. Appreciation of the commercial, financial and marketing aspects of engineering projects and programs and the requirements for successful innovation
- c. Ability to assess realistically the scope and dimensions of a project or task in the field of specialisation, as a starting point for estimating costs and scale of effort required
- d. Understanding of the need to incorporate cost considerations throughout the design and execution of a project and to manage within realistic constraints of time and budget
- e. General awareness of business principles and appreciation of their significance

### **CM3 PROFESSIONAL ATTRIBUTES**

#### **CM3.1 Ability to communicate effectively, with the engineering team and with the community at large**

- a. Fluency in written and spoken English
- b. Ability to make effective oral and written presentations to technical and non-technical audiences
- c. Capacity to hear and comprehend others' viewpoints as well as convey information
- d. Effectiveness in discussion and in presenting arguments clearly and concisely
- e. Ability to represent engineering issues and the engineering profession to the broader community

#### **CM3.2 Ability to manage information and documentation**

- a. Ability to locate, analyse, catalogue and utilise relevant information, including proficiency in accessing, systematically searching, analysing and evaluating relevant publications
- b. Ability to assess the accuracy, reliability, and authenticity of information relevant to the field
- c. Ability to produce clear diagrams and engineering sketches
- d. Fluency in current computer-based word-processing and graphics packages
- e. Ability to maintain a professional journal and records and to produce clear and well-constructed engineering documents such as progress reports, project reports, reports of investigations, proposals, designs, briefs, and technical directions
- f. Awareness of document identification and control procedures

### **CM3.3 Capacity for creativity and innovation**

- a. Readiness to challenge engineering and technological practices from a technical and non technical viewpoint, to identify opportunities for improvement
- b. Ability to apply creative approaches to identify and develop alternative solutions
- c. Awareness of other fields of engineering and technology with which interfaces may develop, and openness to such interactions
- d. Propensity to seek information from widest practicable range of sources e. Readiness to engage in wide-ranging exchanges of ideas, and receptiveness to change

### **CM3.4 Understanding of professional and ethical responsibilities, and commitment to them**

- a. Familiarity with Institution of Incorporated Engineers Sri Lanka's Code of Ethics, and any other compatible codes of ethics relevant to the technology and its areas of application, and commitment to their tenets
- b. Awareness of legislation and statutory requirements relevant to the technology and its areas of application
- c. Familiarity with standards and codes of practice relevant to the technology and its areas of application

### **CM3.5 Ability to function effectively as an individual and in multidisciplinary and multicultural teams with the capacity to be a team leader or manager as well as an effective team member**

- a. Manage own time and processes effectively, prioritising competing demands to achieve personal and team goals and objectives
- b. Earn trust and confidence of colleagues through competent and timely completion of tasks c. Communicate frequently and effectively with other team members
- c. Recognise the value of cultural diversity, develop effective inter cultural skills, and build network relationships that value and sustain a team ethic
- d. Mentor others, and accept mentioning from others, in technical and team issues
- e. Demonstrate capacity for initiative and leadership while respecting others' agreed roles

### **CM3.6 Capacity for lifelong learning and professional development**

- a. Recognise limits to own knowledge and seek advice, or undertake research, to supplement knowledge and experience
- b. Take charge of own learning and development. Understand the need continually to review own strengths, determine areas for development and undertake appropriate learning programs
- c. Commit to the importance of being part of a professional community: learning from its knowledge and standards, and contributing to their maintenance and advancement

- d. Improve non-engineering knowledge and skills to assist in achieving engineering outcomes

### **CM3.7 Professional Attitudes**

- a. Present a professional image in all circumstances, including relationships with clients, suppliers and stakeholders as well as professional and technical colleagues
- b. Demonstrate intellectual rigour and readiness to tackle new issues in a responsible way
- c. Demonstrate a sense of the physical and intellectual dimensions of projects and programs, and related information requirements, based on reasoning from first principles and on developing

## INCORPORATED ENGINEER - Self-Assessment Chart

Note: Do not include this chart with your submission. It is for your personal use only.

<i>Elements</i>	<i>Achieved</i>	Your comments (eg notes on when, where and how achieved)
<b>CM1 KNOWLEDGE BASE</b>		
CM1.1 Knowledge of science and engineering fundamentals.		
CM1.2 In-depth knowledge and understanding of the technology and its applications.		
CM1.3 Techniques and resources.		
CM1.4 General Knowledge.		
<b>CM2 ENGINEERING ABILITY</b>		
CM2.1 Ability to undertake problem identification, formulation, and solution.		
CM2.2 Ability to apply and adapt the technology.		
CM2.3 Proficiency in design of equipment or installations utilising the technology.		
CM2.4 Ability to conduct an engineering project.		
CM2.5 Ability to ensure reliable operation.		
CM2.6 Responsibility as technical expert.		
<b>CM3 PROFESSIONAL ATTRIBUTES</b>		

CM3.1 Ability to communicate effectively, with the engineering team and with the community at large.		
CM3.2 Ability to manage information and documentation CM3.3 Capacity for creativity and innovation.		
CM3.4 Understanding of professional and social responsibilities, and commitment to them.		
CM3.5 Ability to function effectively as an individual and in multidisciplinary and multicultural teams with the capacity to be a team leader or manager as well as an effective team member.		
CM3.6 Capacity for lifelong learning and professional development.		
CM3.7 Professional Attitudes.		

## **ASSOCIATE MEMBER**

### **GENERAL DESCRIPTION OF ROLE**

Associate Members focus mainly on practical applications. They may be expert in installing, testing and monitoring equipment and systems, in the operation and maintenance of advanced plant, and in managing or supervising trade people in these activities. They may be expert in selecting equipment and components to meet given specifications, and in assembling these to form systems customised to particular projects.

Associate Members are often required to be closely familiar with Standards and Codes of Practice, and to become expert in their interpretation and application to a wide variety of situations. Many develop very extensive experience of practical installations, and will be more knowledgeable than a professional engineer or technologist on certain aspects that can contribute very greatly to safety, cost or effectiveness in operation.

In other instances, associate members may develop high levels of expertise in aspects of design and development processes. These might include, for example, the use of advanced software to perform detailed design of structures, mechanical components and systems, manufacturing or process plant, electrical and electronic equipment, information and communications systems, and so on. Other examples might be in the construction of experimental or prototype equipment. Again, experienced operators in these areas often develop detailed practical knowledge and experience complementing the broader or more theoretical knowledge of others.

Associates need a good grounding in engineering science and the principles underlying their field of expertise, to ensure that their knowledge and skills are portable across different applications and situations. Equipment-specific or context-specific training in a particular job are not sufficient to guarantee generic competency. Given a good knowledge base, however, associates may build further on this through high levels of training in particular contexts and in relation to particular equipment. Aircraft maintenance is an excellent example.

The competencies of Associate Members equip them to certify the quality of engineering work and the condition of equipment and systems in defined circumstances, laid down in recognised standards and codes of practice. Such certification should be fully acceptable in the public domain and should not require further endorsement by other practitioners perceived to be more highly qualified.

Associate Members may lead or manage teams appropriate to these activities. Some may establish their own companies or may move into senior management roles in engineering and related enterprises, employing professional engineers and other specialists where appropriate.

## **ASSOCIATE MEMBER -UNITS AND ELEMENTS OF COMPCMENCY**

Units are numbered AM1, AM2 etc. Elements are numbered AM1.1, AM1.2 etc. Indicators are denoted by a, b, c etc.

### **AM1 KNOWLEDGE BASE**

#### **AM1.1 Knowledge of science and engineering fundamentals**

Institution of Incorporated Engineers Sri Lanka considers it essential for Associate Members to have a level and breadth of fundamental knowledge that ensures portability of their skills across different operating environments.

- a. Knowledge of mathematics sufficient to understand from an analytical viewpoint the physical phenomena relevant to the field of engineering and to the technologies commonly employed, and the functioning and limitations of relevant plant and equipment; and to solve problems commonly encountered in the field.
- b. Knowledge in the physical sciences, life sciences and information sciences sufficient to understand situations addressed by the field of engineering and the functioning and limitations of relevant plant and equipment .
- c. Sound basic knowledge of the engineering sciences that support the field of engineering and the technologies employed, and ability to apply this knowledge in normally-encountered situations; awareness of the further scope of relevant engineering sciences.
- d. Knowledge of the properties of materials commonly used in the field of engineering
- e. Analytical skills sufficient to understand and quantify operating situations and to recognise when they may exceed the limits of accepted procedures.
- f. Appreciation of the future need to apply fundamental knowledge to ongoing developments in the field of engineering and to new technologies relevant to the field.

#### **AM1.2 Knowledge and understanding of engineering and technology**

- a. Sound knowledge and understanding of the functioning, performance and operating characteristics of plant and equipment used in the field of engineering.
- b. Ability to apply analytical techniques and knowledge of engineering science to quantify requirements, and to the specification of equipment and materials (where appropriate, including software) to perform satisfactorily in particular situations.

- c. Competence in applying mathematics, science and engineering science to the solution of problems and situations routinely encountered in the field of engineering.
- d. Awareness of current technical and professional practice, critical issues, and the current state of developments in field of engineering.
- e. Ability to relate changing practices to existing knowledge and to question apparent departures from established principles .
- f. Understanding of how new developments in the field of engineering relate to established theory and practice, and to other technical areas with which they may interact.

#### **AM1.3 Techniques and resources**

- a. Awareness of standard design practices and tools currently used in the field, particularly computer based tools and packages, and competence in their use.
- b. Proficiency in laboratory and testing procedures relevant to the field, and strong grasp of principles and practices of laboratory safety.
- c. Ability to calibrate and use measuring instruments, conduct relevant measurements and tests, analyse and interpret data and form reliable conclusions.
- d. Knowledge of common sources of error and their avoidance: ability to recognise known sources of error, eliminate or compensate for them where possible, and quantify their significance to results and conclusions drawn.
- e. Ability to construct and test representative components or sub-systems in a laboratory testing.

#### **AM1.4 General Knowledge**

- a. General knowledge necessary to appreciate the place of engineering and technology in society.

### **AM2 ENGINEERING ABILITY**

#### **AM2.1 Application of standards and codes of practice**

- a. Thorough understanding of the standards and codes of practice relating to the field of engineering and appreciation of their range of applicability.
- b. Ability and commitment to apply the relevant standards and codes in all work undertaken.
- c. Ability to inspect engineering work or installations that are subject to recognised standards and codes, detect shortcomings and verify compliance or otherwise, and specify remedial action.

#### **AM2.2 Specifying and installing systems**

- a. Ability to select and combine available components to form systems meeting given specifications:
  - Understand and document the client's functional requirements.
  - Analyse the functional requirements and develop a performance specification.
  - Confirm that the specification can be met by standard components and equipment in compliance with applicable standards and codes of practice.
  - Select, specify and document the system including all necessary equipment, components and software.
  - Where possible, supervise installation of the system; or construct a prototype system • Conduct all required tests to confirm satisfactory operation.
  - Document operating procedures.

### **AM2.3 Design procedures**

- a. Ability to utilise standard design practices, including advanced software or other design aids, to perform detailed design of components and/or systems.
- b. Ability to perceive unexpected or inconsistent results of the design process, take corrective action, and bring persistent problems to attention.

### **AM2.4 Assessing technical and policy options**

- a. Ability to undertake feasibility studies for prototype development; upgrading, extension or replacement of plant or equipment; procurement of new equipment; new operational procedures etc:
  - Understand and document the objectives.
  - Formulate performance measures including functionality, maintainability, safety, sustainability, user impact, training requirements, and cost-effectiveness.
  - Consult technical and other literature to identify available options • Evaluate options and quantify or rank each against the performance measures.
  - Recommend and justify preferred option
  - Produce clear and concise report of the investigation, comprehensible to both technical and non-technical readers.

### **AM2.5 Observation, analysis and testing**

- a. Ability to conduct expert analysis and testing of materials or processes using agreed procedures, calibrate test instruments and processes, record data, and provide advice on properties, condition, or satisfactory operation.
- b. Ability to critically observe, test and record progress of construction, assembly and commissioning of engineering work.

#### **AM2.6 Operations and maintenance**

- a. Ability to supervise and monitor the operation of complex plant, verify satisfactory and safe operation according to agreed standards, detect and interpret unusual circumstances and bring these to attention.
- b. Ability to conduct condition monitoring and maintenance programs in accordance with agreed standards and procedures, diagnose faults or incipient faults, and propose and/or undertake remedial action.
- c. Ability to investigate technical malfunctions and their causes, or deviations from normal performance, and propose and/or undertake remedial action.

#### **AM 2.7 Specific training**

Candidates whose background has included advanced equipment-specific training:

- a. Evidence of having applied this training in a situation of responsibility and/or taken responsibility for certifying satisfactory condition or operation.

Candidates from mainly educational background:

- b. Appreciation of the likely need to undertake advanced training in specific equipment or procedures and take responsibility for their condition or operation.

#### **AM2.8 Responsibility as technical expert**

- a. Ability to communicate the significance of a technical issue to other technical and non-technical stakeholders in a project or program.
- b. Ability to identify, assess, communicate and manage technical risk in area of expertise c. Appreciate the interactions between technical systems and the social, cultural, environmental, economic and political context in which they operate
- c. Appreciate the imperatives of safety and of sustainability, and approaches to developing and maintaining safe and sustainable systems

#### **AM2.9 Understanding of the business environment**

- a. Introductory knowledge of the conduct and management of engineering enterprises and of the structure and capabilities of the engineering workforce.
- b. Appreciation of the commercial, financial and marketing aspects of engineering projects and programs and the requirements for successful innovation.
- c. Understanding of the need to incorporate cost considerations throughout the design and execution of a project and to manage within realistic constraints of time and budget.
- d. General awareness of business principles and appreciation of their significance.

### **AM3 PROFESSIONAL ATTRIBUTES**

#### **AM3.1 Ability to communicate effectively, with the engineering team and with the community at large**

- a. Fluency in written and spoken English,
- b. Ability to make clear oral and written presentations of technical and non-technical audiences.
- c. Capacity to hear and comprehend others' viewpoints as well as convey information.
- d. Effectiveness in discussion and in presenting arguments clearly and concisely.
- e. Ability to represent engineering issues and the engineering profession to the broader community.

#### **AM3.2 Ability to manage information and documentation**

- a. Ability to locate, analyse, catalogue and utilise relevant information including proficiency in accessing, searching, and evaluating relevant publications.
- b. Ability to gauge the accuracy, reliability and authenticity of information.
- c. Ability to produce clear diagrams and engineering sketches.
- d. Fluency in current computer-based word-processing and graphics packages.
- e. Ability to maintain records and to produce clear engineering documents such as progress reports, project reports, reports of investigations, proposals, designs, and technical directions.
- f. Awareness of document identification and control procedures.

#### **AM3.3 Capacity for creativity and innovation**

- a. Readiness to challenge engineering and technological practices from a technical and non technical viewpoint, to identify opportunities for improvement.

- b. Readiness to apply creative approaches to identify and develop alternative solutions.
- c. Awareness of other fields of engineering and technology with which interfaces may develop, and openness to such interactions.
- d. Propensity to seek information from widest practicable range of sources.
- e. Readiness to engage in wide-ranging exchanges of ideas, and receptiveness to change.

**AM3.4 Understanding of professional and social responsibilities, and commitment to them**

- a. Familiarity with IIESL Code of ethics, and any other compatible codes of ethics relevant to the field of engineering, and commitment to their tenets.
- b. Awareness of legislation and statutory requirements relevant to the field of engineering.
- c. Familiarity with standards and codes of practice relevant to the field of engineering

**AM3.5 Ability to function effectively as an individual and in multidisciplinary and multicultural teams, as a team leader or manager as well as an effective team member**

- a. Manage own time and processes effectively, prioritising competing demands to achieve personal and team goals and objectives.
- b. Earn trust and confidence of colleagues through competent and timely completion of tasks c. Communicate continuously and effectively with other team members.
- c. Recognise the value of cultural diversity, develop effective intercultural skills, and build network relationships that value and sustain a team ethic.
- d. Mentor others, and accept mentoring from others, in technical and team issues.
- e. Demonstrate capacity for initiative and leadership while respecting others' agreed roles.

**AM3.6 Capacity for lifelong learning and professional development**

- a. Recognise limits to own knowledge and seek advice, or undertake research, to supplement knowledge and experience.
- b. Take charge of own learning and development. Understand the need continually to review own strengths, determine areas for development and undertake appropriate learning programs.
- c. Commit to the importance of being part of a professional community: learning from its knowledge and standards, and contributing to their maintenance and advancement.
- d. Improve non-engineering knowledge and skills to assist in achieving engineering outcomes.

### **AM3.7 Professional Attitudes**

- a. Present a professional image in all circumstances, including relationships with clients, suppliers and stakeholders as well as professional and technical colleagues.
- b. Demonstrate appreciation of the evolving nature of engineering and technology, and readiness to tackle new issues in a responsible way.
- c. Demonstrate readiness to apply fundamental knowledge to ongoing developments in engineering and technology, and to embrace new technologies relevant to the industry sector or field of application.
- d. Demonstrate a sense of the dimensions and level of challenge of projects and programs, and related information requirements, based on reasoning from first principles and on developing experience

## ASSOCIATE MEMBER - Self-Assessment Chart

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AM1.4 General Knowledge.		
<b>AM2 ENGINEERING ABILITY</b>		
AM2.1 Application of standards and codes of practice		
AM2.2 Specifying and installing systems		
AM2.3 Design procedures		
AM2.4 Assessing technical and policy options		
AM2.5 Observation, analysis and testing		
AM2.6 Operations and maintenance		
AM2.7 Specific training		
AM2.8 Responsibility as technical expert		

AM2.9 Understanding of the business environment		
<b>AM3 PROFESSIONAL ATTRIBUTES</b>		
AM3.1 Ability to communicate effectively, with the engineering team and with the community at large.		
AM3.2 Ability to manage information and documentation		
AM3.3 Capacity for creativity and innovation.		
AM3.4 Understanding of professional and social responsibilities, and commitment to them.		
AM3.5 Ability to function effectively as an individual and in multidisciplinary and multicultural teams with the capacity to be a team leader or manager as well as an effective team member.		
AM3.6 Capacity for lifelong learning and professional development.		
AM3.7 Professional Attitudes.		

Annex 1 to  
Section E  
Competency Standards applicable for Year  
Issued for year 2008  
By the  
Executive Committee of IIESL UAE Branch

### ***Incorporated Engineer/ Corporate Member***

The candidates should demonstrate at least **two** of the key competency Units of **CM1 KNOWLEDGE BASE, CM2 ENGINEERING ABILITY and CM3 PROFESSIONAL ATTRIBUTES** including 50 % of the competency elements in each Unit. Altogether the candidate should demonstrate 50 indicators using 1-3 Carried Episodes.

### ***Associate Member***

The candidates should demonstrate at least **two** of the key competency Units of **AM1 KNOWLEDGE BASE, AM2 ENGINEERING ABILITY and AM3 PROFESSIONAL ATTRIBUTES** including 50 % of the competency elements in each Unit. Altogether the candidate should demonstrate 35 indicators using 1-3 Carried Episodes.