



GUIDELINES FOR REGISTRATION OF PROFESSIONAL ENGINEERS

Issued by the Engineering Council of South Africa (ECSA)

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Preamble

The Registration Process described in these Guidelines became effective from 1 January 2001. These Guidelines are applicable to the following eight engineering disciplines: **Aeronautical, Agricultural, Chemical, Electrical, Industrial, Mechanical, Metallurgical and Mining**. A separate Guideline for the **Civil** discipline is available at the South African Institution for Civil Engineering (SAICE) as certain differences exist between the registration process for civil engineers and the registration process for engineers of the eight other disciplines. Since this new process incorporates some principles that are new in South Africa, there will be a “settling in” period where finer details of the process may require revision as experience is gained. The principles adopted have, however, been in operation in other countries for some time and have proved successful and effective. A major reason for adopting this new process is to bring the South African processes into line with international trends.

These Guidelines are to be read in conjunction with the following documents published by ECSA:

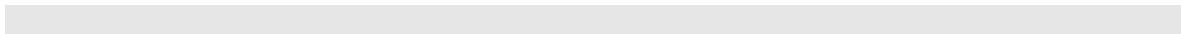
- **Policy Statement R2/1A – Acceptable Engineering Work for Candidate Engineers for Registration as Professional Engineers**
- **Discipline Specific Guidelines:** Available for each of the eight disciplines
- **ECSA Application Form for Registration as a Professional Engineer**
- **Guidelines for Mentors:** Available for each of the eight disciplines

1. DEFINITIONS, TERMINOLOGY AND ABBREVIATIONS

The following definitions are given here in order to simplify and clarify the document. As acronyms are extensively used, it is considered useful to have these all in one section.

CPD	Continuing Professional Development - This term is preferred to others such as Continuing Engineering Education, Continuing Learning, etc. and may include courses, self-study, technical conferences, seminars, symposia, organised site visits, and meetings of professional bodies.
CU	Commitment and Undertaking , is an agreement registered with ECSA by an employer to assist young candidate engineers (CEs) with their training in a structured manner so that ECSA's requirements can be met for registration as a professional engineer.
CE	Refers to a Candidate Engineer who is registered as such with ECSA.
E&T	Education & Training . Covers a broad spectrum of activities spanning a person's whole career. It comprises career guidance, tertiary education, professional development up to the point of professional registration, and life-long professional development after registration.
EA	Experience Appraisal . An assessment whether candidates have demonstrated that they have achieved the required level of competence and acquired the professional attributes specified in the Discipline Specific Guidelines for the discipline concerned, in order to declare candidates suitable for the professional review.
ECSA	Engineering Council of South Africa
Mentor	<p>A person who guides and advises CEs through their training period to achieve maximum possible professional development and professional registration in the shortest possible time. A Mentor must be registered as a Professional Engineer. There can be Internal and/or External Mentors.</p> <p>An Internal Mentor is a person in the service of, and nominated by, a particular employer, having registered a CU with ECSA, and whose name is listed by ECSA against the particular CU.</p> <p>An External Mentor is a person not in the service of the employer concerned but whose services as a Mentor have been solicited by the employer. His/her name is listed by ECSA against a CU registered by the employer.</p>
PAC	Professional Advisory Committee for the specific engineering discipline . This is a committee of ECSA dealing with all the aspects related to setting of standards, processing of applications, and approval or otherwise of applications in the specific branch of Engineering.

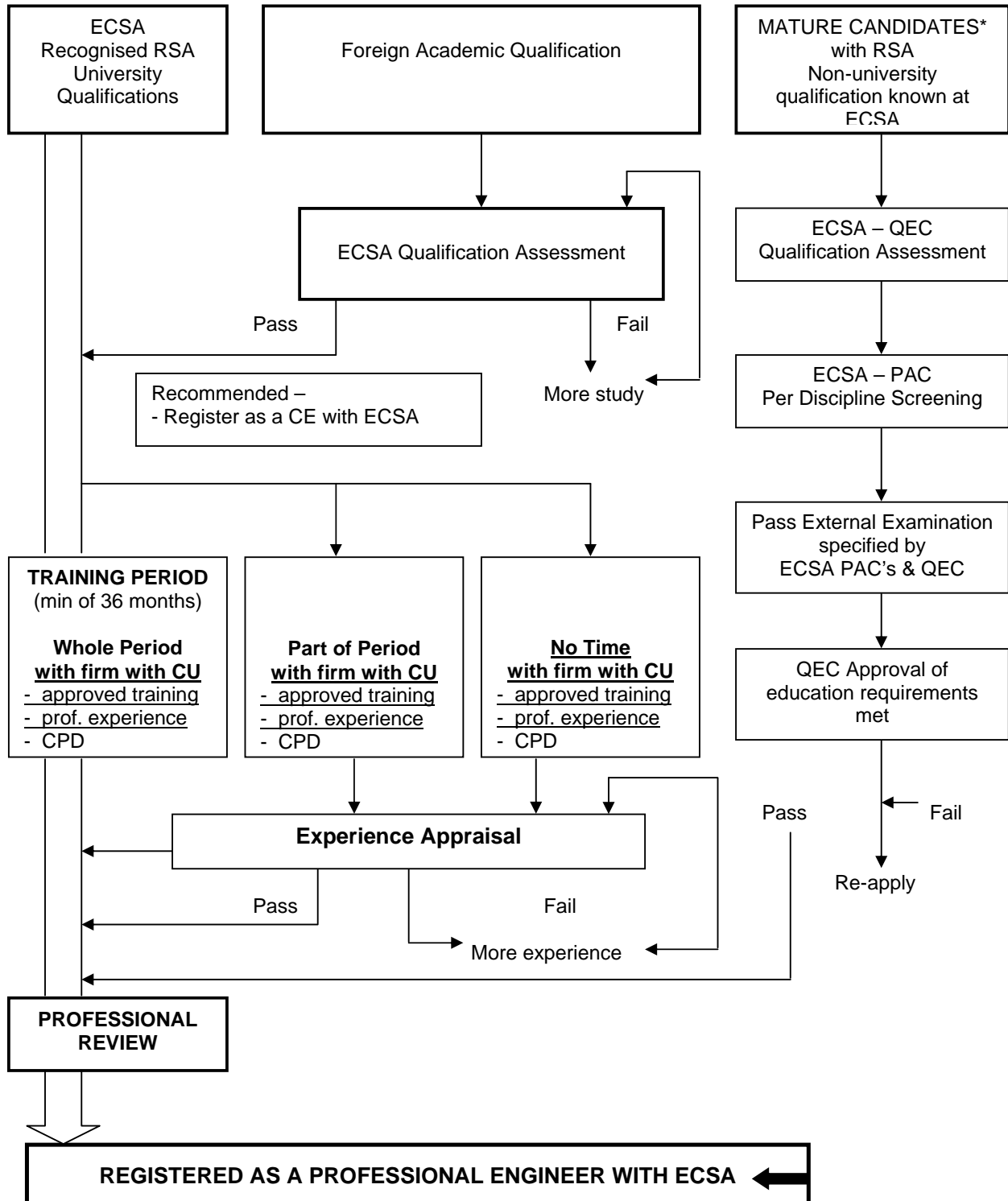
PR	Professional Review A comprehensive review of CEs' engineering careers in the form of an interview, to assess the quality of their professional attributes and the level of competence achieved during the period of training.
Referee	Provides an opinion on a CE's professionalism and overall conduct at any stage during his/her training and is not responsible directly for guiding CEs in their professional development. They should be persons who are well placed to express an opinion without necessarily having a holistic view of the CE's training. A Referee generally <u>must</u> be a Professional Engineer. ECSA requires at least two referees of whom at least one must be a professional engineer and the other one a person registered in terms of the Act (eg. Pr.Tech.Eng.) or foreign equivalents. More information on the roles and responsibilities can be obtained from the Policy Statement R2/1A.
SE	Supervising Engineer. This is a person the CE reports to directly and on a regular basis. CEs will probably have several SEs during their training period as they move from one section of an organisation to another. The SE need not necessarily be an engineer, but could be a registered technologist or technician. The SE can also be a Mentor and vice versa.
Training Period	This is the period between graduation and application for Professional Registration. This period may not be less than 36 months of acceptable and appropriate experience/ training.



2. OVERVIEW OF THE PROCESS AND FLOW CHART

The diagram below gives an overview of the process. These guidelines and other related documents provide more detail on the various steps in the process.

Main Routes to Registration as a Professional Engineer with ECSA



- * Mature Candidate Route: This route is not detailed in this Guideline, but the basic process is given here. The initial screening by the concerned PAC of ECSA is aimed at assessing eligibility for the possibility of passing written examinations by determining the level at which the candidate practices and appraising the experience of the candidate. For more details contact ECSA.

3. STAGES OF THE PROCESS AND ACTIONS REQUIRED BY VARIOUS PARTIES

Checklists for CEs, SEs and Mentors

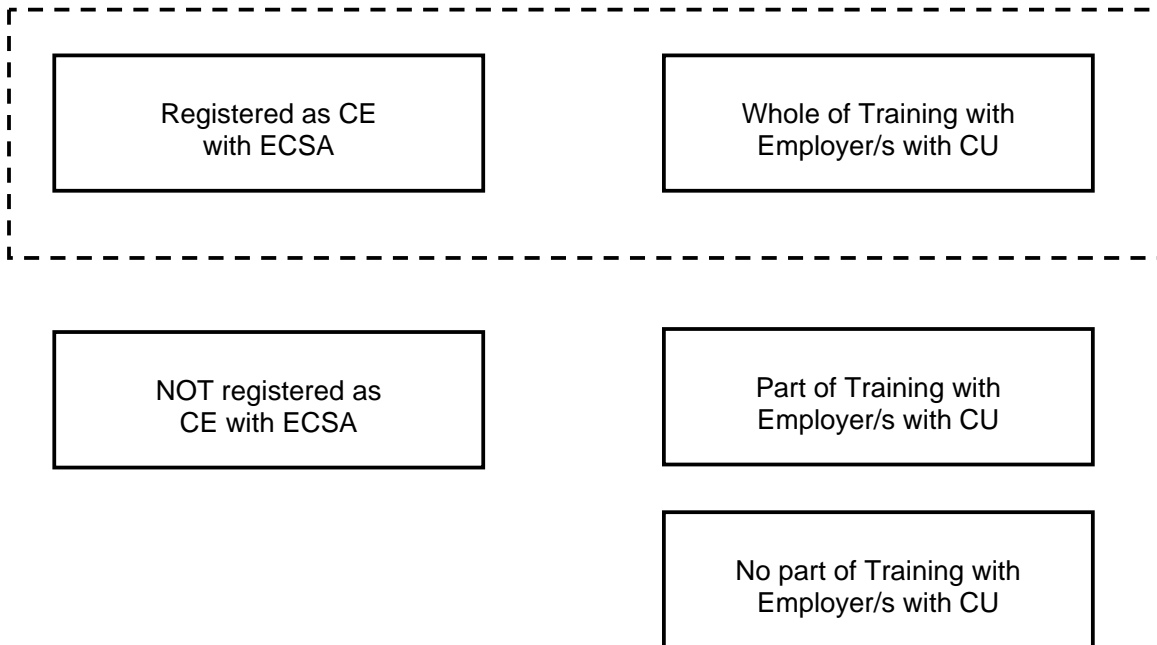
- 3.1 The checklists below provide some guidance on the responsibilities and actions to be taken by the main parties involved. More details regarding the required actions are provided in the sections following the checklists.

These checklists are GUIDES ONLY and should not be seen as exhaustive. It remains the personal responsibility of CEs, SEs and Mentors to ensure that their individual responsibilities are carried out.

Actions required by the various parties will vary depending on several factors. These factors are

- Is the trainee registered with ECSA as a CE or not?
- Did the trainee obtain training at an employer who registered a CU with ECSA or not?

These combinations or options can also be shown graphically as follows:



The recommended, and preferred, combination is outlined (in dotted lines), and trainee engineers are encouraged to follow this route. The checklists given below apply to this combination only, as it offers the maximum benefit to candidates. The checklists can be adapted to cater for other combinations and trainee engineers not following the preferred combination must make their own adaptations. Some notes regarding the combinations are:

CE or not - All trainee engineers are encouraged to register with ECSA as CEs. The benefit of registration is that one is kept informed on developments regarding registration and one receives any new information, as it becomes available.

Training under employer(s) with CU - All trainee engineers are encouraged to do their entire training with employers who have registered CUs with ECSA. Mentors play a crucial role in the training process, and in registering a CU, the employer undertakes to ensure their CEs are assigned to a Mentor. CEs are then much better placed to receive the best possible training to register as a professional engineer in the shortest possible time.

CEs working for employers who have NOT signed CUs should take special care, to ensure that they obtain the assistance of a Mentor. If CEs have not had a Mentor for certain periods, and if their training was not well structured, they should be especially careful to ensure that their training actually addresses all the required objectives and achievement levels. They should also ensure that this experience/training is sufficiently documented and substantiated. Applications from these CEs will go through the Experience Appraisal process.

3.1.1 Checklist for CEs

- Identify your Mentor.
- Discuss and agree on a training plan with your Mentor. This plan should include linking it to the Discipline Specific Guidelines as well as CPD activities to be undertaken. In this regard it is very important that CEs take cognisance of paragraph 6 of the Discipline Specific Guidelines for their specific engineering disciplines in order to get exposure to as wide a variety of training as possible, within their branch of engineering.
- Ensure your SE is aware of the plan.
- Initiate regular discussions with your Mentor.
- Complete a Training Report (Form A2.1 of the application form for professional registration) on completion of each "training period" (or groupings of periods where work of a similar nature was performed), and get these signed off by your Mentor. (See the Information Sheet A2 for definition of training periods).
- Arrange and undertake CPD as planned. Record each CPD activity undertaken and get your Mentor's approval and signature on completion of each activity.
- Review your training plan with your Mentor on a regular basis, record progress and any changes.
- In the last year of training, prepare for PR.

3.1.2 Supervising Engineers (SEs)

(Depending on the circumstances, the SE could also fulfil the role of a Mentor for CEs who do not have Mentors. Employers with a CU are obliged to provide a Mentor.)

- Where possible assist the CE to acquire a Mentor (internal or external).
- Be aware of the CE's training plan developed with the help of the Mentor, or assist the CE in developing a plan if no Mentor is available.
- Assist the CE in developing the required levels of competency throughout the training period.
- Liaise with the Mentor as required.

3.1.3 Mentors

- Be aware of your roles and responsibilities as described in the "Guidelines to Mentors" published by ECSA.
- Ensure regular discussions with each CE under your supervision. (Although the CE should initiate these discussions, you should follow up with the CE if planned dates are not met).
- Assist and guide each CE in developing his/her own training plan. The plan must link into the Discipline Specific Guidelines for the specific engineering discipline concerned and include CPD activities.
- Assist and guide each CE in reviewing his/her training plan throughout the training period to ensure the objectives are met.
- Liaise with the various SEs to ensure the CE is afforded sufficient opportunity to develop the required levels of competency throughout the training period.
- Approve and sign each CE's training reports, where appropriate.
- Write reports on each CE as necessary. It is important that a "Referee's Report" (Form A4.1& A4.2) be completed and returned directly to ECSA when requested by the CE.

- Assist each CE in his/her final stages of training to prepare for the PR.

Transfers of Candidate Engineers

- 3.2 All parties involved with CEs should recognise and appreciate their own professional obligations. Prospective employers of CEs, and CEs themselves, should discuss the prospects of training under a CU at the earliest possible stage, even before a decision (to employ or to accept employment) is made. Employers who have registered a CU will be more likely to attract CEs than otherwise. Once employment has commenced (whether the employer has a CU or not) it is still the CE's ultimate responsibility to ensure that provision has been made for their own training needs. However, they will have a clear advantage if their new employer has already registered a CU with ECSA, because this confirms that the employer is already committed to proper training. (Information on employers who have signed CUs is available from ECSA. If it is at all possible, CEs should attempt to retain the services of their previous mentor(s), especially where the new employer does not have a CU or an internal mentor.

Training Records: Monitoring and Completion

- 3.3 Training records form an essential part of monitoring progress and ensuring that the required competencies and standards are met. Each CE must keep
- Training Reports (Form A2.1) and Training Summary (Form A2.2) up to date - to record the practical training received and experience gained.
 - Keep record of all CPD activities undertaken (including certification by the Mentor).

Application for Registration

- 3.4 When submitting an application, the CE must ensure that all documentation has been completed, failing which, the application will not be considered by ECSA. Remember, this reflects on your professionalism!
- 3.5 More importantly, the CE must ensure that the required levels of competence and professionalism for registration have been acquired and are adequately demonstrated in the documentation submitted. The onus remains solely with the CE to demonstrate that the requirements are met.

The Experience Appraisal (EA)

- 3.6 EAs are applicable to all CEs who have not completed their entire training with employers who have signed a CU.
- 3.7 The EA is done by ECSA, and is essentially a "pre-screening" to assess whether a CE has achieved the required objectives, levels and professionalism necessary to qualify for professional review. It may even be necessary, at the EA stage, to conduct interviews with the CE, but this will not be a substitute for the PR. The decision to hold an interview is entirely at the discretion of ECSA.

The Professional Review (PR)

- 3.8 The PR is designed to enable CEs to demonstrate that:
- (i) they have acquired an understanding of the professional environment in which they work, including moral, ethical, environmental and safety issues;
 - (ii) they have developed the ability to exercise engineering judgement, to make responsible decisions, to communicate lucidly and accurately, to identify and find solutions to problems and to implement these solutions; and that

- (iii) they have achieved an acceptable level of technical knowledge and understanding in defined training objectives within their branch of engineering.
- 3.9 Once an applicant is cleared by ECSA for the PR, ECSA in collaboration with the specific Engineering Institute/Institution will arrange the PR.
- 3.10 CEs will be advised of the exact date and location of the PR.
- 3.11 ECSA will send copies of all documents making up the application to the Reviewers, which are as follows:
- **ECSA Application (Form A1.1 & 2);**
 - **Certified Copies of all Qualifications;**
 - **Documents relating to proof of Membership of Institutes;**
 - **Referee Reports (Form A4.1&A4.2);**
 - **Summary of Training Reports (Form A2.2);**
 - **Training Reports (Form A2.2) completed during the training period;**
 - **The 2000 to 4000 word project report in the case of agricultural engineering candidates.**
- 3.12 PRs are compulsory for all CEs. The general rule is “Nobody registers as a professional engineer unless he/she has passed the PR”. This rule also applies to mature candidates.
- 3.13 PRs will be held as and when required, generally in the major centres. Additional venues may be arranged, depending upon the availability of Reviewers and the number of applications in a particular area.
- 3.14 Reviewers will send reports to ECSA for final decision. ECSA will moderate the PR outcomes, decide and advise CEs of their review results as soon as possible. **Under no circumstances will results be given prior to the final decision.**
- 3.15 Successful candidates will be registered and a certificate of registration will be issued shortly afterwards. Unsuccessful candidates will be advised of the reasons for their failure.

4. PRACTICAL TRAINING AND PROFESSIONAL DEVELOPMENT

The Training Period

- 4.1 The training period is specified as a minimum of three years, as it is not considered possible for a CE to acquire the required range of competencies, and each to the required level, in a shorter period of time. It is anticipated that it will generally take longer than 36 months for a CE to acquire the necessary competencies. Only CEs with very well developed, managed and implemented training programs will reach the requirements in the minimum period. Spending time on a particular element of training without a qualitative objective will not in itself ensure achievement of the required level of competency for that element.

The Training Programme

- 4.2 The underlying philosophy of the whole process is to achieve specific outcomes. The Training Programme serves as a structured mechanism for achieving these outcomes. This is nothing more than a detailed “home-grown” management tool to provide a specific implementation plan by an organisation to achieve an outcome, which happens to coincide with ECSA’s requirements for registration.
- 4.3 Employers who registered a CU have committed themselves to the profession, and are morally bound to develop their own training programmes so that competent and well-rounded engineers are produced. In so doing these employers play a significant role in ensuring the ongoing development and sustainability of the profession.
- 4.4 It does not follow, however, that employers who have not registered a CU are not committed to the same objectives as those who registered a CU. The difference is that they have not declared their commitment to the profession. In this case their CE employees will expect them to develop and implement an appropriate in-house training programme and the profession will be in full support of these CEs.
- 4.5 Training programmes must provide for the development of professional attributes and core competencies common to all CEs, regardless of the type of work undertaken or the specific direction in which their interests take them. Each employer should cater for the common themes as well as the specific types of work done in the organisation.
- 4.6 The training programmes should be designed so that they follow the pattern established in the Discipline Specific Guidelines of the disciplines concerned. This will facilitate the process of reviewing an individual’s training against the prescribed guidelines.
- 4.7 In order to ensure that comprehensive and well-rounded training is provided, the training programme should cover all relevant activities of that organisation. These may include administrative, financial, management and/or other applicable activities.
- 4.8 It is strongly recommended that the appointed Mentor(s) in an organisation be made responsible for drawing up and monitoring the implementation of a training programme. Where more than one training programme exists, more than one Mentor would presumably carry responsibility for the individual programmes and they should collectively take responsibility for ensuring implementation and consistency of content and standard.

Kindly note that ECSA does not approve training programmes as it is the responsibility of employers and their CEs to ensure that the requirements as set out in the Discipline Specific Guidelines for the specific discipline are met.

5. CONTINUING PROFESSIONAL DEVELOPMENT (CPD)

What is CPD?

- 5.1 CPD can be defined as “the systematic maintenance, improvement and broadening of knowledge and skills, and the development of personal qualities necessary for the execution of professional and technical duties throughout an engineer’s career”.

Why CPD?

- 5.2 CPD is aimed at enhancing personal growth, which, in turn, will enhance corporate performance. The benefits are, therefore, symbiotic and self-supporting. In other words, the more an employer supports an individual's CPD, the better the individual becomes, and the better the work produced for the employer. From the employee's perspective, the more an individual participates in CPD, the better his/her performance, thus increasing the likelihood that the employer will recognise improved performance.

In the rapidly changing environment, CPD is considered essential for each engineer so that he/she may stay abreast of current developments and progress in the industry. This contributes to a high standard of service to clients or employers, and promotes the status of engineers in society.

What constitutes CPD?

- 5.3 Any combination of the activities listed below will constitute CPD:
- Attending courses, seminars, congresses and technical meetings organised by Engineering Institutes, universities, other professional bodies and course providers.
 - Actively participating in conferences, serving on technical or professional committees and working groups.
 - Undertaking structured self-study (i.e. using textbooks with examples).
 - Studying technical literature (e.g. journals, magazines)
 - Taking correspondence courses and studying other supervised study packages.
 - Taking in-house courses provided by employers.
 - Enrolling for formal post-graduate studies.
 - Writing technical papers or presenting lectures at an organised event.

6. GUIDANCE NOTES FOR PREPARATION OF REPORTS

Training/Experience Reports (Form A2.1)

- 6.1 A training/experience report must be completed for each training period on the prescribed form (Form A2.1). CEs should especially take note of how training periods are defined and what constitutes a training period. Details are provided on the Information Sheet A2, which forms part of the ECSA application form.

All training reports must be typewritten and the combined reports should not exceed 2000 words.

Each report should set out the CE's training and practical experience and should explain clearly the position they occupied, together with the degree of responsibility assigned to them. Each report should indicate which of the training objectives and discipline specific elements in the Discipline Specific Guidelines were covered, and the extent thereof.

CEs should expand on any special problems they encountered during each period and on any areas where they obtained extensive experience. **CEs should emphasize their personal experience, bringing out the principal lessons learnt, and avoid extensive job specifications and descriptions.** Reports must not be a mere inventory of work prepared and executed. CE's should also list detail of all training courses and CPD activities that they have undertaken.

Summary of Training Reports (Form A2.2)

- 6.2 All Training Reports completed during their training period must be summarised on the prescribed form (Form A2.2).

General

- 6.3 Mentors, SEs or persons to whom the CE was responsible should certify the accuracy of the CE's reports as soon as possible after it was performed.
- 6.4 Reports must bear the name and signature of the CE.

Referee Report (Form A4.1 and A4.2)

- 6.5 One of the prerequisites for the consideration of an application for registration as a professional engineer with ECSA, is the submission of at least two referee reports of which at least one must be completed by a registered professional engineer and the other one at least a person registered in terms of the Act (e.g. Pr Tech (Eng) or their foreign equivalents). Colleagues of applicants should preferably not act as referees. Full details on referee reports are given in paragraph 6 of Sheet A1.2 as well as Sheet A4 of the application form.