

Policy Statement R2/1B

Acceptable Engineering Work for
Candidate Engineering Technologists
for Registration as
Professional Engineering Technologists

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ECSA

ENGINEERING COUNCIL OF SOUTH AFRICA

Private Bag X 691 ● BRUMA ● 2026
Water View Corner ● 1st Floor ● 2 Ernest Oppenheimer Avenue
Bruma Lake Office Park ● Bruma ● Johannesburg 2198
Tel: (011) 607-9500 ● Fax: (011) 622-9295
E-mail: engineer@ecsa.co.za
Website: www.ecsa.co.za

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SECTION 1

1. EXECUTIVE SUMMARY

The Engineering Council of South Africa (hereinafter referred to as ECSA) is responsible for, *inter alia*, the setting of standards for registration of Professional Engineering Technologists and for evaluating Candidate Engineering Technologists (hereinafter referred to as CETs) who present themselves for registration. A number of factors in the rapidly changing South African environment, and in the wider world of engineering, have prompted ECSA to review its policies on standards for registration and the procedures described in this document should be carefully noted by:

- all aspirant Professional Engineering Technologists who have passed an examination required by ECSA (whether registered as Candidate Engineering Technologists or not);
- employers offering a commitment and undertaking to provide employees with the training and guidance necessary for CETs to develop the required level of professionalism; and
- all participants in the process.

1.1 Objective

The objective of this Policy Statement is to inform all stakeholders in the engineering profession in South Africa, what ECSA's requirements are for registration as Professional Engineering Technologists.

1.2 Definition of a Professional Engineering Technologist

Professional Engineering Technologists are persons who, by virtue of a combination of education, training and experience have attained a level of competence, which enables them to apply engineering principles, and techniques to the solution of engineering challenges of varying complexity as required by industry. Their education and training can be relatively broadly based but they may also have specialised in a narrow field. Their work may include a combination of, but not necessarily all the engineering functions of design, research and development, commissioning, project or construction management, measurement and testing, planning, quality assurance, production, maintenance, management and any other activities which require a high level of competence. Their decision-making is at an intellectual level requiring mature judgment, the ability to conceive, identify and optimize technical solutions beyond the mere comparison with accepted standards and norms. They accept full engineering responsibility and accountability for such decisions.

1.3 The Engineering Profession Act, 2000

The Engineering Profession Act, 2000 (Act No. 46 of 2000) requires that applicants who desire to register as Professionals *inter alia* must satisfy Council that they:

- (a) have demonstrated their competence as measured against standards for the relevant category of registration; and
- (b) have passed any additional examinations that may be determined by the council.

In addition this Policy Statement of ECSA describes the experience and practical training which will satisfy its requirements. For the purposes of this Policy Statement, the acceptable work of an engineering nature will generally be referred to as "**practical training**", although far more than training, which includes responsible engineering experience, is involved.

It is further intended that this Policy Statement be used by applicants for professional registration in the various disciplines of engineering, by members of the Registration Committee and Discipline Associated Subcommittees when applications for registration are considered and also by employers when compiling practical training programmes for their Candidates.

SECTION 2

2. REGISTRATION AS A CANDIDATE

A person who has passed an accredited programme and/or examination recognised by Council is eligible for registration in the candidate category in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000). Application forms can be obtained from the Council's offices or be downloaded from ECSA's website at www.ecsa.co.za. The applicable qualification, or its equivalent, as determined by Council from time to time, is set out in Table 1:

Table 1

"Candidate" Category	Recognised or Accredited Qualifications
Candidate Engineering Technologist	B Tech (Eng)

To enable Council to determine whether or not a qualification is equivalent to a recognised qualification, an applicant may be required to attend an interview and/or to sit for an examination. Further details are obtainable from the Council's offices.

SECTION 3

3. ENGINEERING WORK FOR CANDIDATE ENGINEERING TECHNOLOGISTS (CETs)

3.1 Practical Training Requirements for Registration as a Professional

3.1.1 Post-Qualification Practical Training Requirements for Professional Registration

In this Policy Statement, "**practical training**" means engineering experience gained after attaining a recognised qualification in engineering and which may be structured or unstructured.

Council requires that prospective applicants for professional registration be trained (including availing themselves of development opportunities), to its satisfaction in the application of engineering principles and methods within their disciplines of engineering, or combination of disciplines, and be given progressively more responsibility until they are capable of accepting professional responsibility in making and executing engineering decisions at the full professional level.

Candidates must become aware of the interaction between related disciplines of engineering and the other members of the engineering team, with respect to their own tasks. They must develop the necessary judgement to involve and utilise to the best advantage other members of the engineering team. They should develop the ability to apply a holistic approach to the execution of their tasks.

The prescribed minimum practical training period after obtaining a recognised qualification is as set out in Table 2. During this period the trainee should complete a training programme designed to ensure that the training meets the requirements of Council. In the absence of structured training, it is likely that the training required will take longer than the prescribed minimum period as set out in Table 2.

ECSA is cognisant of significant differences between the nature, content and working environment of the broad disciplines of engineering and has adopted a policy for professional development within which the training, appropriate to each discipline and the procedures best suited to evaluating candidates in that discipline, can be defined. The general rule is that CETs for registration must demonstrate their professional development and competence. This requires a procedure for professional assessment by ECSA. It should be noted that standards for registration would not be compromised. Core elements of professional development and specific guidelines for training and documenting progress have been defined for each discipline of engineering. An essential component of ECSA's new approach is to relinquish the approval of specific training programmes in favour of registering a commitment and undertaking (hereinafter referred to as CU) from employers. This provides structured opportunities for CETs to actually develop professionally, in accordance with ECSA's minimum requirements. A CU registered by ECSA will have mentors nominated for assisting CETs in addition to their supervisors in the work situation.

In terms of the revised policy, candidates should benefit from their employer's CU if they provide detailed and structured information on their professional development in accordance with the relevant discipline specific guidelines. They will be able to provide detailed and structured information on their training and development in accordance with the relevant guidelines. CETs whose training is not in accordance with the relevant guidelines more strenuous and detailed professional assessment. There is clearly an incentive to follow the structured route to registration.

Implementation of this revised policy will be dependent on the requirements of the disciplines of engineering as practiced in the workplace.

3.2. Background

- 3.2.1 ECSA has reviewed its requirements for registration as well as its policies and procedures relating to training programmes, acceptable engineering work and professional development. This process involved finalisation of this document, preparation of a more detailed description of discipline specific requirements for each discipline of engineering and the adoption of a new approach to professional development and mentorship.
- 3.2.2 ECSA has taken the following factors into consideration in adopting a new approach in prescribing training requirements and the assessment of applicants:
- (i) The National Qualifications Framework (hereinafter referred to as NQF) and the South African Qualifications Authority (SAQA) will have a profound effect in the training of skilled engineering practitioners in future. Engineering is one of the professions affected by government decisions and it is imperative that the engineering profession adjusts to the new circumstances and, more importantly, plays a decisive role in influencing government thinking in so far as it relates to standards setting and competency assessment.
 - (ii) In the interest of openness and fair administrative procedure it becomes necessary for ECSA to communicate, in more definitive terms, its policies, standards and procedures so as to enable aspirant professionals to prepare themselves better for their future careers.
 - (iii) Since it is one of ECSA's stated objectives to ensure that its standards should at least meet those of the international community, it is necessary to document its requirements in sufficient detail to facilitate assessment by the international engineering community.
- 3.2.3 ECSA's Registration Committee for Professional Engineering Technologists drafted this Policy Statement and core elements for each of the disciplines of engineering. Considering the diverse nature to engineering, recognition is given to the needs of, and requirements for, each discipline of engineering. In the case of CETs, these are developed in conjunction with the appropriate discipline specific guidelines.

Table 2: Minimum Period of Practical Training after Qualification

For Registration as	Qualifications	Period: Years
Professional Engineering Technologist	B Tech (Eng)	3

Council will in judging practical training, amongst others, take into account the following:

- (a) nature of practical training (§ 3.3);
- (b) standard of practical training (§ 3.4);
- (c) variety of practical training (§ 3.5);
- (d) recognition of advanced study (§ 3.6);
- (e) continuing professional development (3.7)
- (f) specialisation (§ 3.8);
- (g) lectureship (§ 3.9);
- (h) practical training outside the Republic of South Africa (§ 3.10).

3.3 Nature of Practical Training

3.3.1 Candidate Engineering Technologists

The practical training must include all the essential elements of practical training stated in Section 4.

The following aspects are pertinent to the "nature of practical training":

- (a) The work must essentially be pre-eminently intellectual, of sufficient variety and not of a routine nature;
- (b) Candidates must strive to develop the ability to:
 - (i) execute a task timeously and correctly, against the background of acquired knowledge and standard procedures/techniques. They must be able to show that a good balance was maintained between the development of innovative concepts or creative ability and the use of standard procedures, which simplify their task;
 - (ii) maintain a balance between the technical effectiveness of a solution and acceptable costs, within the available timespan; take effective decisions where the technical tools (knowledge, skills and aids) at their disposal are not sufficient to provide obvious solutions;
 - (iii) continuously consider the impact of their decisions on social, safety and environmental aspects, taking into account all relevant legislation.
- (c) Candidates must keep themselves informed of new technological developments.

In evaluating an applicant's experience, Council takes the following aspects into consideration:

- (i) the technological level at which the work was performed;
- (ii) the level of technical and administrative responsibility reached by the applicant;
- (iii) the measure of the variety of the tasks, which were mastered within the discipline of engineering or combination of disciplines;
- (iv) applicable advanced studies which complement the work and which were completed before or during the applicable work experience (§ 3.6);
- (v) the overall level of competency reached by the applicant.

3.4 Standard of Practical Training

3.4.1 Candidates

The standard required is that Candidates must increasingly develop the ability to use their theoretical and practical knowledge to the full professional level independently and without constant supervision. They should be capable of innovative planning, design and management. They must be able to provide proof that they can do their work with the necessary intellect, insight and methodical approach applicable to their category.

3.5 Variety of Practical Training

The practical training must consist of a variety of engineering tasks, which must include aspects of management, administration, economics, environmental factors, quality assurance, construction and projects, legislation and safety, at a level appropriate to each category.

“Variety of technical tasks” is taken to include those activities in a certain recognised discipline of engineering, which pertain to the practical training (problem investigation, problem solving, execution/implementation and the acceptance of responsibility) as further described in paragraph 7.

Further information regarding the variety of practical training in each discipline of engineering may be obtained from the relevant recognized engineering bodies. It is not necessarily expected from trainees that they receive practical training in all sub-disciplines of their discipline of engineering.

3.6 Recognition of Advanced Study

The prescribed minimum period (see Table 2) for practical training takes effect after attainment of a qualification recognised by Council.

Recognition of up to 12 months may be considered in respect of advanced study and then only if the nature of the work and the level of responsibility was the same as can be expected from a Candidate being trained in accordance with the principles and requirements embodied in this Policy Statement.

The following Policy is applicable for Candidate Engineering Technologists:

If an applicant after at least one year of post-graduate study passes a post-graduate examination in engineering which Council recognises for this purpose, and the study contained an acceptable practical component, Council may on the merit of each case, give recognition to such practical component. Suitable research work with adequate practical content will be taken into account. This means that all the essential practical training elements, stated in Section 4, must be present in the advanced study.

3.7 Continuing Professional Development (CPD)

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”.

The principle to undertake CPD is included in the Engineering Profession Act, 2000 (Act 46 of 2000). At the time of registration, candidates will be assessed as having the professional competence to enable them to practice safely and effectively in their discipline of engineering. At the technical interview Candidates will be required to provide evidence of CPD undertaken during their period of post- qualification training and indicate how they intend to meet their obligations to CPD during their professional careers. Professional Engineering Technologists are obliged by the Code of Conduct to undertake CPD, the nature, range and extent of what is required varies with the work to be undertaken. Professional Engineering Technologists are required, at all times, to take all reasonable steps to maintain and develop their competence and knowledge in their field of professional activity. Moreover, they must not under any circumstances accept or undertake work which they do not have sufficient competence, time or authority to perform, unless the necessary advice, assistance or authority is obtained.

Any combination of the activities listed below will constitute CPD:

- Attending courses, seminars, congresses and technical meetings organized by Engineering Institutes, universities, other professional bodies and course providers.
- Actively participating in conferences, serving on technical or professional committees, and activities of professional engineering institutes.
- 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 organized event.

3.8 Specialisation

Candidates who have specialised in an engineering field during their practical training to the extent that they do not comply with all the requirements of Section 8, may nevertheless be registered as a Professional on condition that:

- (i) they have attained knowledge in their field of engineering at least at the level of a qualification recognised by Council; and
- (ii) they have gained the minimum years of experience as stipulated in Table 2 after obtaining the qualification recognised by Council, the experience being of such a nature that it enables them to take engineering decisions with the necessary responsibility; and
- (iii) they possess a qualification which is recognised by Council in the field in which they specialise, or that they can prove that their work is at a level comparable with a person holding a recognised qualification; and
- (iv) Candidates who mainly use **computers as an analytical tool** in their work may be considered as specialists. Their experience should show adequate general engineering content and must be of such an engineering level and nature that other members of the engineering profession can use their results at a professional level.

3.9 Lectureship

Council prefers that lecturers in engineering at universities, universities of technology and other approved engineering training establishments be registered as Professionals in order to foster the correct attitude amongst their students with respect to professionalism and registration.

To register professionally, these lecturers should do some of the following practical engineering work **in addition to** their lecturing:

- (i) consulting work in which the applicant has demonstrated ability at a professional level to identify engineering problems and produce solutions which can be satisfactorily implemented;
- (ii) planning, design, development, commissioning and/or application of research equipment or processes associated with engineering projects;
- (iii) be responsible for the management of workshops, laboratories and ancillary facilities; and
- (iv) execution of research projects and results (preferably published) which includes the application of the essential practical training elements stated in Section 8.
- (v) Lecturers lecturing at Universities of Technology and applying for registration as Professional Engineering Technologists should at least lecture subjects at B Tech level in order for their lecturing experience to be considered for registration purposes.

Since lecturers cannot be involved in the above-mentioned engineering work on a fulltime basis, the minimum practical training period will normally be five years but each application will be considered on merit.

3.10 Practical Training outside the Republic of South Africa

Applicants who received their practical training in engineering work abroad will be considered in accordance with the principles and requirements contained in this Policy Statement.

3.11 Date of Registration

The "**date of registration**" is that date on which Council decided to register an applicant. This is also the date which appears on all registration certificates. Of necessity, it is always later than the date on which application was made, as Council requires time to consider an application.

3.12 Interview

An applicant who has applied for registration as a Professional must attend an interview should Council so request. The purpose of this interview would usually be to establish the extent to which applicants meet the principles and requirements contained in this Policy Statement, the extent to which they benefited from their practical experience and whether they have accepted professional responsibility at the required level for their work, within the Code of Conduct. The interview will take the form of an experience appraisal.

3.13 Responsibility of Candidates

Candidates should appreciate that the onus rests on themselves to ensure that the training they receive will meet all the requirements set out in this Policy Statement. Council prefers that they follow a training programme under a Commitment and Undertaking Agreement (CU), which has been registered by Council and which, as is required, has at least one mentor registered in terms of the CU.

Should Candidates experience difficulties with their training, they should attempt to resolve them through the normal channels, for example with the mentors (see § 3.14) responsible for their guidance. The relevant engineering institutes/bodies, recognised under the Act, have indicated their willingness to assist Candidates in this regard.

Candidates must submit regular at least quarterly training reports to their supervisors/mentors, as arranged with their employer. The reports must clearly show the extent to which the requirements with respect to the essential practical training elements stated in Section 4 are met, as well as the extent to which they benefited from their practical training. The method and format used in these reports should be such that the persons in training find the reports useful when applying for registration as Professionals. The mentor shall be an appropriately registered person unless otherwise agreed to by Council.

Note: The lack of training opportunities cannot be accepted as a reason for the lowering of the minimum standards set for registration.

3.14 Supervision of Candidates

(a) Internal Mentorship

Training should preferably be supervised by a person registered in an appropriate category of professional registration (see Clause 4.17) in the employing organisation that would be both guide and mentor to the Candidate. All Professionals are under a moral and professional obligation to help with the training of Candidates, if at all possible.

The obligations of mentors in this regard are:

- (i) agreeing to give guidance to Candidates regarding their career planning and professional development and to advise them on suitable training programmes which meet Council's requirements;
- (ii) ensuring that Candidates are exposed to the essential practical training elements, as stated in Section 4;
- (iii) facilitate conditions and measures in order for Candidates to develop independent thinking;
- (iv) encouraging Candidates to work as team members;
- (v) ensuring that Candidates are gradually exposed to increasing engineering responsibility and to work of increasing complexity;
- (vi) ensuring that Candidates incorporate quality assurance techniques in their work;

- (vii) ensuring that Candidates gradually be exposed to more comprehensive management tasks and that they are given responsibility for them;
- (viii) receiving progress reports by Candidates and appraising them in a **critical** yet constructive manner;
- (ix) evaluating and reporting on the progress which the Candidates have made during the period under their guidance and advising Candidates if any deficiencies exist;
- (x) ensuring that there is an equitable arrangement with the Candidate's supervisor for access to the Candidate, and to encourage the Candidate to ensure that the requirements of this Policy Statement are met.

(b) External Mentorship

Should the services of an internal mentor not be available to an employer, the employer may use the services of an external mentor through one of the relevant recognised engineering institutes/bodies. Mentors thus appointed should be sensitive to any limitations, which the employer may wish to set in any given situation.

External mentors have the same duties as an internal mentor, as stated in § 3.14.

(c) Supervision

Direct supervision of Candidates need not be the mentors' function. The supervisors of Candidates undertake direct supervision of their daily tasks under the general guidance of their mentors. The direct supervisors need not necessarily be persons registered in the categories required for mentors as indicated in § 3.14(a).

3.15 Responsibility of Employers

It is recommended that employers of Candidates, as a matter of policy, draw up a training programme in accordance with Section 5.

The employers are expected to ensure that Candidates are always under the guidance (not necessarily the direct supervision) of a mentor in their employ, as stated in §3.14(a). If employers do not have suitable persons as internal mentors in their employ, they must ensure that external mentors be appointed, as stated in §3.14(b).

3.16 Application for Registration as a Professional

Applicants must indicate the category for which application is made and provide all the information requested in the application form, before Council will consider the application.

It is essential that Candidates provide detailed information (with dates in chronological order) about their personal specific involvement and responsibility in engineering tasks or engineering projects. Supporting documentation for the most important of these projects in respect of each phase of training must be presented in date order. It is important that the level of responsibility reached in each phase is clearly stated.

The prescribed application fee must accompany the application.

3.17 Code of Conduct

It is of the utmost importance that Candidates, throughout the practical training period, remain aware of, and act according to, the Code of Conduct for the engineering profession as contained in the rules in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000), a copy of which is obtainable from the Council's offices. The Code of Conduct will also be forwarded to each person upon registration as a Candidate.

SECTION 4

4. TRAINING PROGRAMMES AND MENTORS

4.1 Experience has shown that, with the exception of a few industries, the system of approving training programmes did not necessarily achieve the desired results, mainly because factors such as the state of the economy at any given time dictated the extent to which employers were able to train their CETs to meet ECSA's standards. Programmes were accordingly not strictly adhered to, thus diminishing the justification for a comprehensive and time-consuming system of approval by ECSA. This, amongst others, prompted ECSA to seek other approaches, which would allow sufficient flexibility, whilst maintaining (if not strengthening) the commitment of employers and CETs to training and professional development.

4.2 After due consideration ECSA accepted the following points of departure:

- (i) CSA will not be prepared to reduce standards by registering persons who, through force of circumstances beyond their control (e.g. state of the economy), could not be trained in accordance with ECSA's requirements.
- (ii) CETs are in any event strongly discouraged from applying for registration until they clearly meet all the requirements, regardless of the time taken to do so.
- (iii) Employers should be expected to provide maximum opportunity for training, given practical and financial constraints, and to ensure regular interaction between CETs and their mentors. A list of mentors should be established which would enable ECSA and the Institutes to maintain contact with mentors and to keep them abreast of the requirements.
- (iv) The level of commitment on the part of CETs and their employers, towards achieving the desired levels of competence would determine the rate of their progress towards professional registration.
- (v) The Council will maintain its established policy, namely "To ensure as far as is possible, that the applicant is registerable before acceptance". This policy is dictated by ECSA's statutory responsibility to ensure that public interest, safety and health are safeguarded. Whilst ECSA will do everything in its power to provide applicants a fair opportunity to prove their competence, minimum standards will not be compromised.

4.3 An official register was accordingly established in which a CU would be registered by ECSA for all employers who apply for such registration.

The system will involve the following:

Definitions

In this context the word –

"commitment" refers to the expressed resolve on the part of employers as an indication of their alignment with, and substantive support for, one of the ideals of the profession, namely that every possible opportunity, support and guidance should be afforded to CETs during their period of training and professional development; and

"undertaking" refers to employers' expressed resolve to give effect to their commitment to the best of their ability.

4.4 In short, the implications to these "expressions of intent" will be that employers will be required to –

- (i) structure the training of, and actually train, their CETs, in accordance with the requirements of this Policy Statement as well as the relevant discipline specific guidelines, and
- (ii) provide regular guidance to their CETs through mentors.

“Training under a CU”

- 4.5 Upon registration of a CU, employers will be expected to ensure that all the essential elements referred to in this Policy Statement as well as the discipline specific guidelines have been addressed by the end of the training period.
- 4.6 It should be noted that by registering a CU, employers are not discouraged from drawing up more detailed programmes appropriate to their own circumstances. In fact it is highly recommended that they do so because it represents an internal management tool to achieve the stated objectives outlined in this Policy Statement and the discipline specific requirements. ECSA has indicated its continued preparedness to assist employers in drafting their programmes, although such programmes will not be registered.
- 4.7 Section 5 deals specifically with training programmes and whilst this section still holds true in terms of what is considered a desirable format of a training programme, it should now be considered as a guideline for an internal training programme.
- 4.8 Each CU will have a permanent registration number allocated, which should be quoted by all persons when applying for registration as professional engineering technologists.
- 4.9 Since ECSA views these “expressions of intent “in a very serious light, it must be satisfied that they not only represent corporate policy, but also that top management assumes ultimate responsibility for implementation of this policy. It will accordingly be expected that CEOs issue the necessary directives to those charged with this responsibility.
- 4.10 The credibility of an employer’s CU will be measured through an ongoing verification process where the quality of applicants’ training and the level of their professionalism will be assessed. The advantage will normally be that CETs become registered in the shortest possible time after graduation. In the case of an employer’s consistent failure, or inability, to honour its CU, the situation can arise where ECSA may have no alternative but to deregister such employer’s CU.

Mentors

- 4.11 Employers must, when registering a CU, confirm the availability of a mentor within the organisation, or expressly undertake to arrange an external mentor to guide their CETs through the required process of training.
- 4.12 A CU will not be registered by ECSA unless at least one mentor (internal or external) is listed against that CU. It will be the responsibility of the listed mentors to advise Council of their movements should their association with an employer and the particular CU, in respect of which they had been registered, be terminated.
- 4.13 ECSA will only accept registered persons for purposes of listing. It will be expected of a listed mentor to demonstrate the necessary commitment and to accept professional responsibility for fulfilling this function. Guidelines for mentors are contained in clause 3.14 of this Policy Statement and further communications will from time to time be directed to mentors.
- 4.14 A mentor should ideally be in the service of the employer whose CETs require mentoring, and should be sufficiently senior to be able to influence decisions in the organisation. If a professional engineering technologist or professional engineer is not available internally, employers are required to procure the services of an “external” mentor. ECSA and/or the relevant institute can be approached to assist in identifying a suitable person. While it is recognised that employers may be sensitive to “interference” from outside, it is strongly recommended that employers and external mentors define the latter’s jurisdiction at the earliest opportunity.
- 4.15 ECSA and the institutes will jointly maintain a list of internal and external mentors. Persons wishing to offer their services as mentors are most welcome to forward their names to ECSA and the relevant Institute.

- 4.16 A mentor must be registered as a professional engineer or professional engineering technologist. Council will only in exceptional cases consider the listing of experienced and mature professional certificated engineers, or professional engineering technicians, with the knowledge and experience requirements for registration as a professional engineering technologist, upon application and motivation by the organisation/ mentor concerned.
- 4.17 A mentor should not be confused with a “referee” or a “ supervisor”. The mentor should be a person who is able to provide guidance and professional support to CETs. Mentors need not necessarily be directly involved on the day-to-day supervision of CETs, whereas supervisors are persons who interact daily with CETs. It is, however, possible that the mentor can also be the supervisor. The referee is normally a person who is called upon to provide an opinion on an applicant’s professionalism at any particular stage during a CETs training. A referee does not carry any responsibility for guiding CETs in their professional development. They happen to be persons who are well placed to express an opinion without necessarily having a holistic view of an applicant’s training. It is possible that a referee can also be a mentor or a supervisor.

SECTION 5

5. PRACTICAL TRAINING PROGRAMMES

- 5.1 An acceptable practical training programme should contain an undertaking that the employer will provide practical training to meet the requirements of the principles contained in this Policy Statement.

Such a practical training programme for Candidates should include the following:

- (a) an indication of the time to be spent on each essential practical training element and the level of responsibility and competency envisaged, as stated in Section 4;
 - (b) the guidance that the mentors/supervisors will be giving the Candidate;
 - (c) the training reports that will be expected from the Candidates and from the mentors/supervisors and other personnel involved on a regular basis (**at least** quarterly), as described in § 3.13.
- 5.2 The general planning and co-ordination of the practical training should be under the guidance of a mentor who should preferably be a senior Professional in the appropriate category in the employer organisation.
- 5.3 A record of the practical training should be kept. The record should indicate the extent to which the work meets the requirements of acceptable practical training.
- 5.4 Individual practical training programmes should contain a clear statement reminding Candidates that the onus rests on themselves to ensure that the practical training they are receiving will meet the requirements contained in this Policy Statement, as detailed in § 3.13.
- 5.5 In cases where employers of Trainees are unable to provide complete training as described in this Policy Statement, consideration should be given to the secondment of Trainees to other employers for this purpose.

An example of the CU appears below:

Commitment and Undertaking (CU)

I the undersigned, _____, in my capacity as _____ of _____ hereby wish to register our commitment and undertaking (CU) to structure the training of, and actually train, our candidate engineering technologists in accordance with the requirements of ECSA's Policy Statement R2/1B as well as specific requirements laid down by ECSA in respect of the discipline of _____ engineering.

I hereby confirm that it is our expressed intention, in so far as we are able to do so, to encourage our engineering graduates to register as candidate engineering technologists and to provide them every possible opportunity to achieve the standard of professionalism required by ECSA.

- *The professional engineering technologists and/or professional engineer referred to in the attached Annexure have been identified from within the organisation to act as internal mentors in accordance with the guidelines set out in Policy Statement R2/1B and the more specific guidelines appropriate to the discipline of _____ engineering, where applicable, or;*
- *Since we do not have a person on our staff who qualifies for internal mentorship, the following person(s) has/have been appointed as external mentor(s) for our candidate engineering technologists and we undertake that we will create an environment which is conducive to effective liaison between our candidate engineering technologists and the external mentor(s).*

We hereby undertake that, in the event that any one, or more, or all of the mentors referred in this application should leave our employ, or be unable to fulfil their functions as mentors, we will immediately advise the Council of any such change and provide the name(s) of any replacement(s).

We understand and accept that ECSA has the discretion to deregister this CU should the training provided by this organisation not satisfy ECSA's requirements, provided that ECSA shall have given reasonable notice of its intention to do so and have given reasonable time in which any deficiencies should be rectified.

- *Delete whichever is not applicable*

Copies of the Commitment and Undertaking are available from ECSA's offices.

SECTION 6

6. DISCIPLINE SPECIFIC GUIDELINES

- 6.1 The essential elements of acceptable engineering work have been defined in broad terms in this Policy Statement. These cover all the generic elements relevant to the main disciplines of engineering recognised by ECSA. **It should be noted that this document deals exclusively with University of Technology graduate Technologists in engineering.**
- 6.2 In addition to this Policy Statement, ECSA has prepared discipline specific guidelines for each of the main disciplines of engineering recognised by ECSA. The discipline specific guidelines are intended to be complementary to this Policy Statement.
- 6.3 Where employers have engineering graduates in more than one discipline of engineering, they should take careful note of the differences between the various disciplines.
- 6.4 All the disciplines of engineering will follow essentially the same procedure in assessing applications.
- 6.5 It will, however, be expected of CETs to provide more structured and detailed information of their training than in the past. In essence, this new dispensation is aimed at providing more specific guidelines to CETs and then requiring them to report in more specific terms when applying for registration as professional engineering technologists. If this requirement is met, the Registration Committee for Professional Engineering Technologists will be able to assess the quality and extent of an applicant's professional development without necessarily calling for an interview.

6.6 It is of utmost importance that CETs should consult the discipline specific guidelines and the application forms for the particular engineering disciplines in which they have received their training, because these documents contain essential details on the type of information, which ECSA requires for registration in any specific discipline of engineering.

6.7 Experience appraisal

- (i) As it will not normally be possible to assess the level of training of applicants who did not train under a CU, nor in accordance with the requirements of this Policy Statement and the Discipline Specific Guidelines for the duration of their training period, they will be assessed with the view to determining whether or not they are eligible for registration via the experience appraisal route which will result in a pre review committee assessment and recommendation prior to a technical interview. Applicants who have received their training outside the R.S.A. would normally be assessed via this route.
- (ii) If, in spite of not having trained under a CU, it appears to ECSA, from the submitted application forms, that applicants may have achieved the stated objectives, they will be accepted as candidates for a technical interview which will include submission of calculations and a presentation of the applicant's training and engineering and responsible engineering experience reports.
- (iii) If applicants appear not to have achieved the objectives, they will be refused registration at that stage and be advised as to the reasons for refusal to enable them to correct the deficiencies in their training
- (iv) Once these applicants have corrected their deficiencies, they will be welcome to re-apply by submitting details of their remedial actions and ECSA will again assess their training for purposes of accepting them as candidates for the professional review.
- (v) Depending on circumstances candidates who have not trained under a CU may expect to take longer to achieve acceptable competency in all the prescribed objectives.

6.8 Technical Interview

Applicants may be required to undergo a technical interview, which will include the submission of calculations and a presentation of the applicant's training and responsible engineering experience reports.

6.9 Transitional Period

A Transitional period will be allowed before the new system is fully implemented. The rationale for this is not to disadvantage CETs who have been in the pipelines for more than one year.

SECTION 7

7. WHAT GRADUATES AND EMPLOYERS SHOULD DO

- 7.1 All employers having training programmes, which have previously been accepted by ECSA, should review their programmes on the basis of this Policy Statement and the discipline specific guidelines appropriate to that discipline. CETs, and graduate Technologists not already registered as such, should remind their employers of their moral obligation to do so.
- 7.2 The ultimate responsibility, however, remains with the CET who wishes to become registered as a Professional Engineering Technologist.
- 7.3 Employers should, identify registered persons in their employ who are able and willing to act as mentors and advise ECSA of their names when registering their CUs. It should be clear from the submission whether these mentors will act as internal mentors only or whether they also wish to offer their services as external mentors to other CETs who do not have the benefit of an internal mentor.
- 7.4 Although this Policy Statement will automatically be posted to all CETs and those employers with accepted training programmes, copies of the relevant discipline specific guidelines and application forms should be obtained from ECSA without delay.

SECTION 8

8. ESSENTIAL ELEMENTS OF ACCEPTABLE PRACTICAL TRAINING

8.1 Elements applicable to Candidates

Acceptable practical training must provide satisfactory experience to Candidates in the application of engineering principles and methods and must include the practical training elements as stated in clauses 7.1.1 to 7.1. 3 inclusive at the level of responsibility stated in the Discipline Specific Guidelines.

8.1.1 Problem Investigation

The work must be aimed at investigating engineering problems and for which engineering judgement is required. The following practical engineering functions are contained in such work to a greater or lesser degree:

- (a) problem identification and formulation;
- (b) finding and selecting relevant information;
- (c) evaluating, investigating, testing and research;
- (d) analysis of all factors that influence the solution like relevant engineering and scientific principles;
- (e) taking into account all practical, economic, social, environmental, quality assurance, safety and statutory factors.

8.1.2 Problem Solution

The work must be aimed at the full development of the suggested solution to the problem through a process of synthesis, with the application of all information acquired during the problem investigation, also using design, development and communication. This includes but is not limited to the drawing up of plans, detailed designs, reports, specifications, adjudication of tenders taking into account all practical, economic, social, environmental, quality assurance, safety and statutory factors.

8.1.3 Execution / Implementation

The work must be aimed at the execution of engineering tasks or projects (for example construction, manufacturing, transformation, processing, production, commissioning, testing, certification, quality assurance, operation, maintenance and closure) encompassing the efficient utilisation of people, materials, machines, equipment, means and funding with due regard for their interaction, to achieve the end result within the set parameters.

8.1.4 Responsibility

The work must be aimed at increasing engineering and managerial responsibility until Candidates are clearly able to accept full professional responsibility for taking engineering decisions. Part of their responsibility should also be to ensure that sufficient cognisance is taken of economic considerations, social circumstances, environmental factors, quality assurance, safety and legal aspects as well as of the Code of Conduct.

Notes:

- (i) The degree of responsibility of Candidates, as well as their personal and specific involvement with each project, should be clear from the reports, which accompany their applications;
- (ii) different weights may be awarded to the essential elements of practical training, depending on the requirements of the specific engineering disciplines;
- (iii) different composition of the essential practical training elements may be structured in order to evaluate the level of work performed. These could be application of technological knowledge, manipulative skills, thinking skills, communication skills, interpersonal skills and management skills.