



Professional Engineers

POLICY STATEMENT R2/1A

Acceptable Engineering Work for Candidate Engineers for Registration as Professional Engineers

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E C S A

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SECTION 1

EXECUTIVE SUMMARY

The Engineering Council of South Africa (ECSA) is responsible, *inter alia*, for the setting of educational and professional development standards with the view to registering persons who apply for registration as professional engineers. A number of factors in the rapidly changing South African environment, such as the new Engineering Profession Act, 2000 (Act No 46 of 2000) and in the wider world of engineering, have prompted ECSA over the past few years to review its standards, policies and procedures relating to registration.

Following the promulgation of the new Engineering Profession Act, the decision was taken to produce separate Policy Statements for each category and in so doing to incorporate the Policy and Procedures documents into the new Policy Statement. This Policy Statement therefore replaces Policy Statement R1/1 for engineers and Policies and Procedures: Training Requirements for Professional Development of Engineers in Training.

This revised Policy Statement should be carefully noted by:

- (i) all aspirant professional engineers (whether registered as candidate engineers or not);
- (ii) employers offering a commitment and undertaking to provide employees with the training and guidance necessary for candidate engineers to develop the required level of professionalism; and
- (iii) all participants in the process.

ECSA is cognisant of significant differences between the nature, content and working environment of the different 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 candidate engineers in that discipline, can be defined. The general rule is that candidate engineers 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 have not been 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 discontinue the process of approval of specific training programmes and to replace it with the registration of a "Commitment and Undertaking" (C&U) submitted by employers. This will provide flexibility and an opportunity for candidate engineers to structure their training and to develop professionally in accordance with ECSA's minimum requirements. A C&U will only be registered by ECSA if a registered mentor is appointed to guide candidate engineers in the work situation.

In terms of the revised policy, candidate engineers should benefit from their employer's C&U if they provide detailed and structured information on their professional development in accordance with the relevant Discipline Specific Guidelines. Candidate engineers, whose training is not in accordance with the relevant guidelines, will be subjected to a more stringent and detailed professional assessment. There is clearly an incentive to follow the structured route to registration.

Implementation of this revised policy will be responsive to the circumstances in each recognised discipline of engineering. In all disciplines the Professional Review (PR), in the form of a personal interview have been introduced to comply with international requirements. In civil engineering, however, a PR includes an interview, a project presentation by the candidate engineer, as well as a written test in the form of two essays.

SECTION 2

BACKGROUND

The following factors prompted ECSA to review its standards, policies and procedures, and to adopt a new approach in prescribing training requirements and the assessment of applicants:

- (a) The National Qualifications Framework (NQF) and the South African Qualifications Authority (SAQA) will have a profound effect on the training of skilled manpower in future. Engineering will probably be one of the professions most affected by government decisions and it is imperative that the engineering profession should be able to adjust to the new circumstances and, more importantly, play a decisive role in influencing government thinking in so far as it relates to standards setting and competency assessment.
- (b) 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.
- (c) Having been admitted as a full member of the Washington Accord (which provides mutual accreditation of undergraduate qualifications at universities), and as a signatory to the Engineers Mobility Forum (which is striving to achieve a system of mutual recognition at the full professional level to facilitate cross-border mobility of registered professional engineers), ECSA's policies, procedures and standards are increasingly coming under scrutiny on a world-wide basis. 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.
- (d) The need has been identified to improve the process of evaluation of applicants without necessarily increasing the standards. Whilst ECSA is still satisfied with its standards, concern has been expressed that ECSA's evaluation process may not be adequately streamlined, or sufficiently comprehensive, to ensure that all persons registered actually meet the requirements in full.
- (e) The so called "New Registration System" for engineers, given in the Policies and Procedures issued on 23 May 1996 and the Discipline Specific Guidelines, was introduced for all disciplines except civil from 1 January 1997. The new system for civil engineers was introduced from 1 January 1998, as a longer transition period was required to accommodate the differences for civil engineers. Candidate civil engineers have to attend a Professional Review (PR), prepare a 4000-word project report and are required to write two essays under examination conditions after the interview. Since 1 January 2001, the other 8 disciplines are also required to attend a PR.

SECTION 3

INTRODUCTION

3.1 Purpose

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

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

The purpose of this Policy Statement is to describe the experience and practical training, which will satisfy the requirements determined by the Council in terms of the Act. 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 is involved.

It is further intended that this Policy Statement be used by applicants for registration as professional engineers and also by employers when compiling practical training programmes for their candidate engineers.

3.2 Categories registered by Council

The ECSA registers persons in the categories as set out in Table 1:

Table 1 Categories Registered by Council

"Candidate" Categories	Full Professional Categories
Candidate Engineer	Professional Engineer
Candidate Engineering Technologist	Professional Engineering Technologist
Candidate Certificated Engineer	Professional Certificated Engineer
Candidate Engineering Technician	Professional Engineering Technician

This Policy Statement specifically covers the categories of Candidate Engineer and Professional Engineer only. Policy Statements are available for the other categories mentioned in Table 1 and can be obtained from the Council's offices or downloaded from ECSA's website www.ecsa.co.za.

3.3 Description of a Professional Engineer

Professional Engineers are concerned primarily with the progress of technology through innovation, creativity and change. Their work involves the application of a significant range of fundamental principles, enabling them to develop and apply new technologies, promote advanced designs and design methods, introduce new and more efficient production techniques, marketing and construction concepts, and pioneer new engineering services and management methods. They may be involved with the management and direction of high risk and resource intensive projects. Professional Engineers undertake and lead varied work that is essentially intellectual in nature, requiring discretion and judgement. Such work has its base in proficiencies and competencies derived from and extended by experience and research. It is concerned with cost effective, timely, reliable, safe, aesthetically pleasing and environmentally sustainable outcomes.

SECTION 4

REGISTRATION AS A CANDIDATE ENGINEER

A person who has passed an accredited programme(s) and/or examination recognised by Council is eligible for registration in the candidate engineer category in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000).

The recognised or accredited qualifications, or their equivalents, as determined by Council from time to time, are basically BSc (Eng) or B Eng. To enable Council to determine whether or not a foreign or other 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.

Application forms can be obtained from the Council's offices or be downloaded from ECSA's website at www.ecsa.co.za.

SECTION 5

ESSENTIAL ELEMENTS OF ACCEPTABLE PRACTICAL TRAINING

Acceptable practical training must provide satisfactory experience to candidate engineers in the application of engineering principles and methods and must include the practical training elements as stated in § 5.1 to § 5.3, at the level of responsibility stated in § 5.4.

5.1 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;

5.2 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.

5.3 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.

5.4 Responsibility

The work must be aimed at increasing engineering and managerial responsibility until candidate engineers are clearly able to accept 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 professional conduct.

Notes:

- (i) The degree of responsibility of candidate engineers, 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.

SECTION 6

DISCIPLINE SPECIFIC GUIDELINES

- 6.1 Whilst considerable consensus was reached amongst the various Professional Advisory Committees, it became clear to ECSA that, considering the diverse nature of engineering, recognition should be given to the needs of, and requirements for, each discipline of engineering. The needs of the various engineering disciplines largely dictated the approach, which the respective professional advisory committees wished to adopt in achieving the objectives of this Policy Statement as well as a result appropriate to their particular discipline of 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, namely aeronautical, agricultural, chemical, civil, electrical/electronic, industrial, mechanical, metallurgical and mining engineering.
- The Discipline Specific Guidelines are intended to be complementary to this Policy Statement.**
- 6.3 The Discipline Specific Guidelines prepared by the Professional Advisory Committees set out clearly what graduate engineers should do when they start their training after graduation. Reference is made to the responsibilities of graduates and their mentors. The discipline specific requirements are well documented and the guidelines provide instructions as to how graduates should report on their progress and what their mentors should do in assessing their progress.
- 6.4 It is of utmost importance that candidate engineers should consult the Discipline Specific Guidelines for the particular engineering discipline 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.
- 6.5 Where employers have engineering graduates in more than one discipline of engineering, they should take careful note of the differences between the various disciplines. The differences revolve mainly around the assessment procedures of applicants for registration.
- 6.6 Copies of the Discipline Specific Guidelines for engineers are available from ECSA's offices and may also be downloaded from the website at www.ecsa.co.za. Copies of these guidelines as well as the appropriate forms will, as a matter of course, be forwarded to all candidate engineers upon registration as such.

SECTION 7

ENGINEERING WORK FOR CANDIDATE ENGINEERS

7.1 Post-Qualification Practical Training Requirements for Registration as a Professional Engineer

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 level appropriate to a professional engineer.

Candidate engineers 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 three years, as it is not considered possible for candidate engineers 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 candidate engineer to acquire the necessary competencies. Only candidate engineers with very well developed, managed and implemented training programmes 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. In the absence of structured training, it is likely that the training required will take longer than the prescribed minimum period.

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

- (a) nature of practical training (§ 7.2);
- (b) standard of practical training (§ 7.3);
- (c) variety of practical training (§ 7.4);

Candidate engineers will be expected to also have knowledge of the Code of Conduct (§ 7.5) and to have undertaken Continuing Professional Development (§ 7.6).

Council's policy is also given for candidate engineers to whom the following may be applicable:

- (a) recognition of advanced study (§ 7.7);
- (b) specialisation (§ 7.8);
- (c) lectureship (§ 7.9);
- (d) practical training outside the Republic of South Africa (§ 7.10),

7.2 Nature of Practical Training

The practical training must include all the essential elements of practical training stated in Section 5.

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) Candidate engineers 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;
 - (iii) take effective decisions where the technical tools (knowledge, skills and aids) at their disposal are not sufficient to provide obvious solutions;
 - (iv) continuously consider the impact of their decisions on social, safety and environmental aspects, taking into account all relevant legislation.
- (c) Candidate engineers must keep themselves informed of new technological developments.

7.3 Standard of Practical Training

The standard required is that candidate engineers must increasingly develop the ability to use their theoretical and practical knowledge to an advanced 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 discipline of engineering.

7.4 Variety of Practical Training

The practical training must consist of a variety of technical tasks, which must include aspects of management, administration, economics, environmental factors, quality assurance, legislation and safety, appropriate to each discipline.

"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 Section 5.

Further information regarding the variety of practical training in each discipline of engineering may be obtained from the Discipline Specific Guidelines for each discipline of engineering obtainable from Council and also available on the website at www.ecsa.co.za. It is not necessarily expected from candidate engineers that they receive practical training in all the sub-branches of their discipline of engineering.

7.5 Code of Professional Conduct

It is of the utmost importance that candidate engineers, throughout the practical training period, remain aware of, and act according to, the code of professional 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 engineer.

7.6 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, candidate engineers will be assessed as having the professional competence to enable them to practice safely and effectively in their discipline of engineering. At the Professional Review (PR) candidate engineers 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 Engineers are obliged by the Code of Professional Conduct to undertake CPD, the nature, range and extent of what is required varies with the work to be undertaken. Professional Engineers 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:

- (i) Attending courses, seminars, congresses and technical meetings organized by Engineering Institutions/Institutes, universities, other professional bodies and course providers.
- (ii) Actively participating in conferences, serving on technical or professional committees and working groups.
- (iii) Undertaking structured self-study (i.e. using textbooks with examples).
- (iv) Studying technical literature (e.g. journals, magazines)
- (v) Taking correspondence courses and studying other supervised study packages.
- (vi) Taking in-house courses provided by employers.
- (vii) Enrolling for formal post-graduate studies (limited credits).
- (viii) Writing technical papers or presenting lectures at an organized event.

7.7 Recognition of Advanced Study

The prescribed minimum period (see § 7.1) for practical training takes effect after attainment of the entry level qualification recognised by Council. (See Section 4).

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 engineer being trained in accordance with the principles and requirements embodied in this Policy Statement and the appropriate Discipline Specific Guidelines.

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 5, must be present in the advanced study.

7.8 Specialisation

Candidate engineers 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 5, may nevertheless be registered as a professional engineers on condition that:

- (i) they have attained knowledge in their field of engineering at least at the level of a masters degree; and
- (ii) they have gained a minimum of five years' experience after obtaining the bachelor degree in engineering, the experience being of such a nature that it enables them to take engineering decisions with the necessary responsibility.

7.9 Lectureship

Council prefers that lecturers in engineering at tertiary institutions be registered as professional engineers in order to foster the correct attitude amongst their students with respect to professionalism and registration.

To register as professional engineers, 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 5.

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.

7.10 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.

7.11 Responsibility of Candidate Engineers

Candidate engineers 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 (C&U) (See Section 8), which has been registered by Council and which, as is required, has at least one mentor registered in terms of the C&U.

Should candidate engineers experience difficulties with their training, they should attempt to resolve them through the normal channels, for example with the mentors (see § 7.13) responsible for their guidance. The relevant engineering Institutions/Institutes/bodies, recognised under the Act, have indicated their willingness to assist candidate engineers in this regard.

Candidate engineers 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 5 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 professional engineers. The mentor shall be a professional engineer or another registered person if 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.

7.12 Responsibility of Employers

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

The employers are expected to ensure that candidate engineers are always under the guidance (not necessarily the direct supervision) of a mentor in their employ, as stated in § 7.13(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 § 7.13(b).

7.13 Supervision of Candidate Engineers

(a) Internal Mentorship

Training should preferably be supervised by a person registered as a professional engineer in the employing organisation, who would be both guide and mentor to the candidate engineer. Professional engineers are under a moral and professional obligation to help with the training of a candidate engineer, if at all possible.

The obligations of mentors in this regard are:

- (i) agreeing to give guidance to candidate engineers regarding their career planning and professional development and to advise them on suitable training programmes which meet Council's requirements;
- (ii) ensuring that candidate engineers are exposed to the essential practical training elements, as stated in Section 5;
- (iii) facilitate conditions and measures in order for candidate engineers to develop independent thinking;
- (iv) encouraging candidate engineers to work as team members;
- (v) ensuring that candidate engineers are gradually exposed to increasing engineering responsibility and to work of increasing complexity;
- (vi) ensuring that candidate engineers incorporate quality assurance techniques in their work;
- (vii) ensuring that candidate engineers gradually be exposed to more comprehensive management tasks and that they are given responsibility for them;
- (viii) receiving progress reports by candidate engineers and appraising them in a critical yet constructive manner;
- (ix) evaluating and reporting on the progress which the candidate engineers have made during the period under their guidance and advising candidate engineers if any deficiencies exist;
- (x) ensuring that there is an equitable arrangement with the candidate engineer's supervisor for access to the candidate engineer, and to encourage the candidate engineer 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 Institutions/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 § 7.13(a).

Direct supervision of candidate engineers need not be the mentors' function. The supervisors of candidate engineers 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 § 7.13(a).

SECTION 8

TRAINING IN TERMS OF A COMMITMENT AND UNDERTAKING (C&U)

- 8.1 The approval of training programmes by the previous South African Council for Professional Engineers (SACPE) started many years ago. For a programme to be approved, the employer concerned had to show that it would provide work of sufficient variety and standard to satisfy the general requirements of SACPE for each discipline. In addition, a general outline had to be given on the path of training a candidate engineer would follow together with the time spent in each portion of the programme.
- 8.2 Experience has shown that, with the exception of a few industries, the system of approving training programmes did not necessarily produce 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 candidate engineers 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 candidate engineers to training and professional development.
- 8.3 After due consideration ECSA accepted the following points of departure:
- (a) ECSA will not be prepared to reduce standards by registering persons who, through force of circumstances beyond their control (i.e. state of the economy), could not be trained in accordance with ECSA's requirements.
 - (b) Candidate engineers 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.
 - (c) Employers should be expected to provide maximum opportunity for training, given practical and financial constraints, and to ensure regular interaction between candidate engineers and their mentors. A list of mentors should be established which would enable ECSA and the Institutions/Institutes to maintain contact with mentors and to keep them abreast of the requirements.
 - (d) The level of commitment on the part of candidate engineers and their employers, towards achieving the desired levels of competence should determine the rate of their progress towards professional registration.
 - (e) The Council will maintain its established policy, namely "When in doubt about the registerability of an applicant, refuse the application". This policy is dictated by ECSA's statutory responsibility to ensure that public interest, safety and health is 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.
- 8.4 An official register was accordingly established in which a commitment and undertaking (C&U) will be registered by ECSA for all employers who apply for such registration. The system will involve the following :

Definitions

- 8.5 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 candidate engineers 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.

- 8.6 In short, the implications of these "expressions of intent" will be that employers will be required to -
- (a) structure the training of, and actually train, their candidate engineers, in accordance with the requirements of this Policy Statement as well as the relevant Discipline Specific Guidelines, and
 - (b) provide regular guidance to their candidate engineers through mentors.

"Training under a C & U"

- 8.7 Upon registration of a commitment and undertaking (C&U), 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 at the end of the training period.
- 8.8 It should be noted that by registering a C&U, 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.
- 8.9 Each C&U has a permanent registration number allocated, which should be quoted by all persons when applying for registration as professional engineers.
- 8.10 By quoting the C&U's registration number on the application, those registered as candidate engineers will benefit because ECSA's approach to the evaluation of such applications will change. In essence the emphasis will shift from a "first principle" approach aimed at a fundamental assessment of an applicant's functional ability against all the requirements, to a "quality assurance" approach, which is aimed at verifying whether, and to what extent, the candidate engineers training was structured in accordance with the requirements.
- 8.11 ECSA requires an employer's Chief Executive Officer to register the C&U. 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 the proper implementation of this policy. It will accordingly be expected that CEOs issue the necessary directives to those charged with this responsibility.
- 8.12 The credibility of employers' C&U will be measured through an ongoing verification process where the quality of applicants' training and the level of their professionalism will be assessed. The reward will normally be that candidate engineers become registered in the shortest possible time after graduation (i.e. three to four years). In the case of an employer's consistent failure, or inability, to honour its C&U, the situation can arise where ECSA may have no alternative but to deregister such employer's C&U.

Mentors

- 8.13 Employers must, when registering a C&U, confirm the availability of a mentor within the organisation, or expressly undertake to arrange an external mentor to guide their candidate engineers through the required process of training.
- 8.14 A C&U will not be registered by ECSA unless at least one mentor (internal or external) is listed against that C&U. It will be the responsibility of the listed mentors to advise Council of their movements should their association with an employer and the particular C&U, in respect of which they had been registered, be terminated.
- 8.15 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 available for each discipline of engineering and can be downloaded from ECSA's website at www.ecsa.co.za.

- 8.16 A mentor should ideally be in the service of the employer whose candidate engineers require mentoring, and should be sufficiently senior to be able to influence decisions in the organisation. If a 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.
- 8.17 ECSA and the Institutions/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.
- 8.18 A mentor must be registered as a professional engineer. Council will only in exceptional cases consider the listing of experienced and mature professional engineering technologists, professional certificated engineers, or professional engineering technicians, upon application and motivation by the organisation/mentor concerned.
- 8.19 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 candidate engineers. Mentors need not necessarily be directly involved in the day-to-day supervision of candidate engineers, whereas supervisors are persons who interact daily with candidate engineers. 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 candidate engineer's training. A referee does not carry any responsibility for guiding candidate engineers 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.

An example of the C&U appears below:

COMMITMENT AND UNDERTAKING (C&U)

I the undersigned, _____, in my capacity as _____ of _____ hereby wish to register our commitment and undertaking (C&U) to structure the training of, and actually train, our candidate engineers in accordance with the requirements of ECSA's Policy Statement R2/1A as well as the 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 engineers and to provide them every possible opportunity to achieve the standard of professionalism required by ECSA.

**The professional engineers 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 R2/1A and the more specific guidelines appropriate to the discipline of engineering, where applicable.*

**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 engineer(s) and we undertake that we will create an environment which is conducive to effective liaison between our candidate engineer(s) 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 C&U 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 9

PROCESS FOR REGISTRATION AS A PROFESSIONAL ENGINEER

9.1 Application for Registration as a Professional Engineer

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

It is essential that candidate engineers 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

9.2 Experience Appraisal (EA)

The Experience Appraisal is an assessment of the application to determine whether candidate engineers have demonstrated that they have achieved the required level of competence and acquired the professional attributes specified in the Discipline Specific Guidelines for the engineering discipline concerned, in order to declare candidate engineers suitable for the Professional Review (PR).

- (a) Applicants who did not train under a C&U, nor in accordance with the requirements of this Policy Statement and the Discipline Specific Guidelines, for the duration of their training period, will be assessed with the view to determining whether or not they are eligible for the PR. Applicants who have received their training outside the RSA would automatically be assessed via the Experience Appraisal route.
- (b) If, in spite of not having trained under a C&U, it appears to ECSA that applicants may have achieved the stated objectives, they will be accepted as candidates for a PR.
- (c) It may be necessary for ECSA to call for an informal interview before deciding on an applicant's candidacy. 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 are ready to advance to the PR stage of their application.
- (d) It is also possible that ECSA might, as an exception to the rule, dispense with the PR in cases where an applicant proves to be eminently registerable.
- (e) If applicants appear not to have achieved the objectives, they will be refused registration at this stage and be advised as to the reasons for refusal to enable them to correct the deficiencies in their training.
- (f) 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 PR.

9.3 Professional Review (PR)

The Professional Review (PR) is a comprehensive review of the applicant's engineering career 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. It is designed to enable candidate engineers to demonstrate that they have acquired an understanding of the professional environment in which they work; that 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 they have achieved an acceptable level of technical knowledge and understanding in defined training objectives within their discipline of engineering.

The PR for each candidate is undertaken by two reviewers selected from a panel of reviewers approved by the Professional Advisory Committee (PAC) concerned. Reviewers, who are senior and experienced professional engineers, are appointed to the panel following nomination by the Institutions/Institutes concerned.

After the review, the reviewers will make recommendations to PAC concerned, which moderate the outcome of the reviews. The PAC will either confirm the recommendations or decide on other options depending on the merits of each case. Applicants are then advised accordingly.

9.4 Frequency of Professional Reviews

- (a) Professional Reviews take place at least four times a year. Applicants will be expected to submit their applications timeously to enable ECSA and/or the Institution/Institutes concerned to prepare the applications and make the necessary arrangements regarding venues and reviewers. Venues other than Johannesburg may also be identified at other major metropolitan centres depending on demand.
- (b) Applicants will be given a choice as to which sitting they wish to present themselves, subject to deadlines and other logistical constraints.

9.5 Date of Registration

The "**Date of Registration**" is that date on which Council, through the Registration Committee for Professional Engineers, 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.
