ENGINEERING COUNCIL OF SOUTH AFRICA *Standards and Procedures System*			ECSA
Processing of Applications for Registration as Candidate Engineer and Professional Engineer			
Status: Approved by Council			
Document: R-03-PE	**Rev-1**	**11 January 2011**	

Background: ECSA Registration System Documents

The documents that define the Engineering Council of South Africa (ECSA) system for registration in professional categories are shown in Figure 1 which also locates the current document.

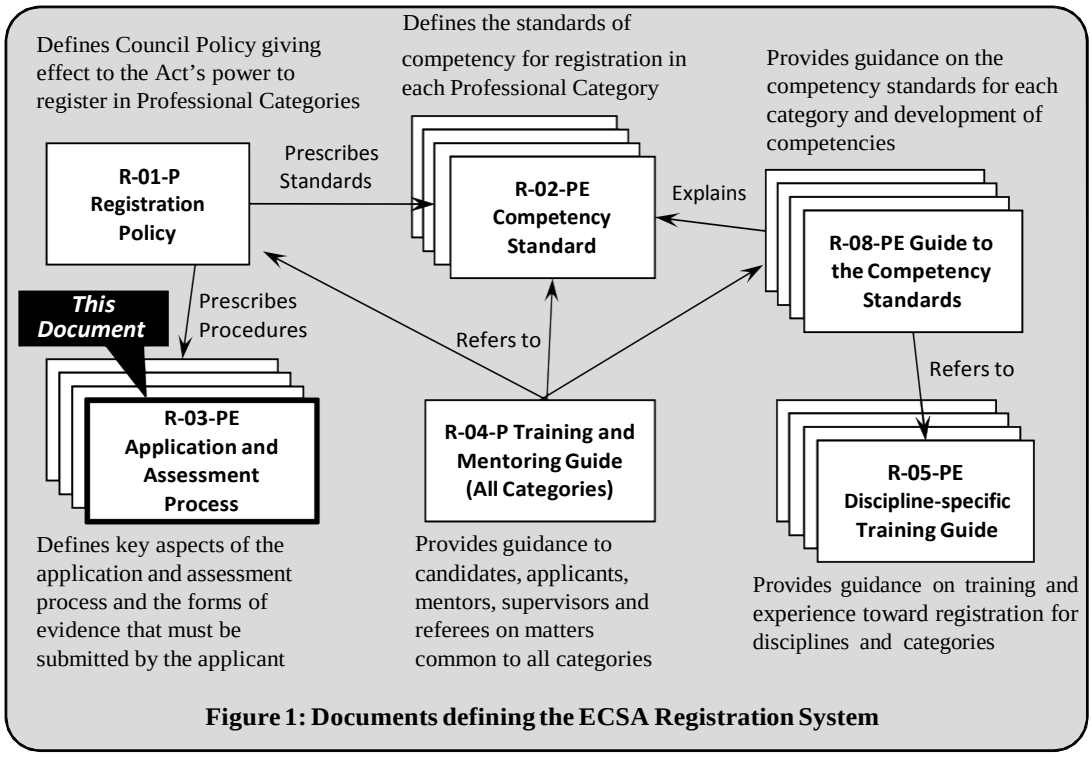

Figure 1: Documents defining the ECSA Registration System

1. Purpose of this Document

This document defines the processes used by ECSA to receive, process and make decisions on applications for registration as a Candidate Engineer or as a Professional Engineer.

These processes are carried out under the authority of the Engineering Profession Act (Act No. 46 of 2000) and registration policies defined in document R-01-P. This document supports the management of the registration process and assessment of Applicants against the competency standard R-02-PE. Section 4 provides a high-level definition of the registration process resulting from the implementation of the policy defined in document R-01-P.

Contents

2. Changes introduced in this document

ECSA Registration Policy, Competency Standards and Education Evaluation policy approved in November 2010 and March 2011 and the processes defined in this document bring about a number of changes to the registration system, greater clarity as well as improvements to the application and assessment process. The main changes are summarized in Table 1. In summary:

1. It is not the intention to change the standard required for registration, but to better define it in terms of the outcomes produced and the required level rather than specifying that the training must be such as to develop competence. See Appendix A for a comparison between the specification of R2/1A, supplemented by the DSG and the Competency Standard R-02-PE.
2. The forms of evidence of competence have been made uniform across the disciplines and provide evidence against all the outcomes. See Appendix B for the role of each form of evidence in relation to individual outcomes.
3. The assessment process is uniform across the disciplines.

3. Process Outline

The processes defined below are designed to handle the various cases that arise on the route to registration taking into account that applicants for professional registration do not necessarily register in a candidate category and that the educational requirement may be satisfied by several mechanisms, including educational evaluation.

The registration process is divided into two main sections:

- A secure system for applying on-line, entering the necessary data and uploading documents as required; and
- The core assessment process encompassing the Experience Appraisal, Professional Review, Committee Decision and Administrative finalization.

3.1 Common User Identification and Login

Figure 1 shows the essentials of the application system. A new user must supply basic details before being given a User Id and a password. Basic details are: First Name(s), Surname, Date of Birth, Title, South African ID number (or Passport number and Nationality if not in possession of an SA ID), e-mail Address, Mobile Phone Number. The person must also indicate whether he or she was previously or is currently registered or has previously applied, supplying the Registration/Application Number (if known).

After determining that the person is not already in position of a User ID, the system will issue the user with a unique User ID and sets up a password. Existing users may login at anytime. The user will be presented with a menu which will ultimately contain all the services available. For applicants for Candidate and Professional Engineer four options are relevant:

Table 1: Changes introduced by 2011 policy, standards and procedures

Aspect	Prior to this policy	Under this policy
Registration Policy	Embedded in Policy R2/1A: Acceptable Work for Candidate Engineers; does not consider other classes of applicants explicitly.	• Single, integrated policy R-01-P, defining registration and education policy, linking with standards (R-02-PE) and processes (this document), applies to all applicants.
Educational Requirements Policy	Accredited or recognized qualification or prior evaluation of qualification(s) as meeting educational requirements.	• No change to accredited or recognized qualifications. • Accelerated evaluation of listed qualifications. • Evaluation criteria defined in document E-17-P for qualifications and assessed learning.
Standard of Competency for Registration	Training requirements for Candidate Engineers, in R2/1A section 5 with further requirements in the Discipline Specific Guidelines Professional Attributes in section 5) for seven disciplines	• Competency Standard for registration as a Professional Engineer in document R-02-PE. • Eleven outcomes, with definitions for the level of problem solving and engineering activities. • Professional Attributes included in standard. • Level descriptors differentiate categories
Seeking registration without normal qualification	Only the Engineer "alternate route" available (ND or equivalent plus 10 years working at level of PrEng, Experience Appraisal, then write final year exams).	• Criterion-based method of meeting education requirements by evaluation and assessment defined in E-17-P. When educational requirements are complete, apply for registration in normal way. No additional time limits. • Identified methods of further learning and assessment.
Evidence of Training/ Competency	For all disciplines: • Training and Experience Summary • Training and Experience Reports Varying requirements across disciplines: • Project Report[a] • Essay Test[b] • Claim to Competency[c] • Presentation[d]	Uniform requirements across disciplines: • Training and Experience Summary (TES) • Training and Experience Reports (TER) • Training and Experience Outlines (TEO)[e] • Engineering Report[f] • Presentation • Pre-registration CPD-type activity
Assessment of Competency	Two different assessment instruments used in professional reviews a) Civil (including essay) and Electrical b) Other disciplines	• Policy (R-01-P) defines main stages and permitted decisions in the assessment process. • Common assessment instruments addressing the outcomes and an integrative judgement, providing consistent trails through all stages.
Decision Making	Delegation of decision to register or defer to the PAC, reserve refusal to Central Registration Committee	• No change to delegation. • Two deferments permitted. • Credit given for outcomes fulfilled.
Application	Manual (paper-based)	Online
Process Definition	Embedded in part in other documents	• High level process definition (in this document). • Detailed IT system specification.
Training and Mentoring Guidelines	Discipline Specific guidelines having force of standards/policy. Three variants: a) Chemical b) Civil c) Remaining seven disciplines	Layered set of guidelines: • Training and mentoring (all categories) (R-04-P) with defined responsibility levels. • Guide to competency standards for Professional Engineers (R-08-PE). • Discipline-specific Training Guide (R-05-PE).
Notes	a. Different formats across the disciplines b. Civil Engineering only c. Electrical Only d. Civil Engineering only	e. Defined short form of TER, with clear rules when a TEO may be substituted by experienced applicant f. Replaces Project report, emphasis on demonstrating the applicant's engineering ability

- Apply for registration as a Candidate Engineer
- Apply for registration as a Professional Engineer
- Apply for Educational Evaluation
- Continue with my application

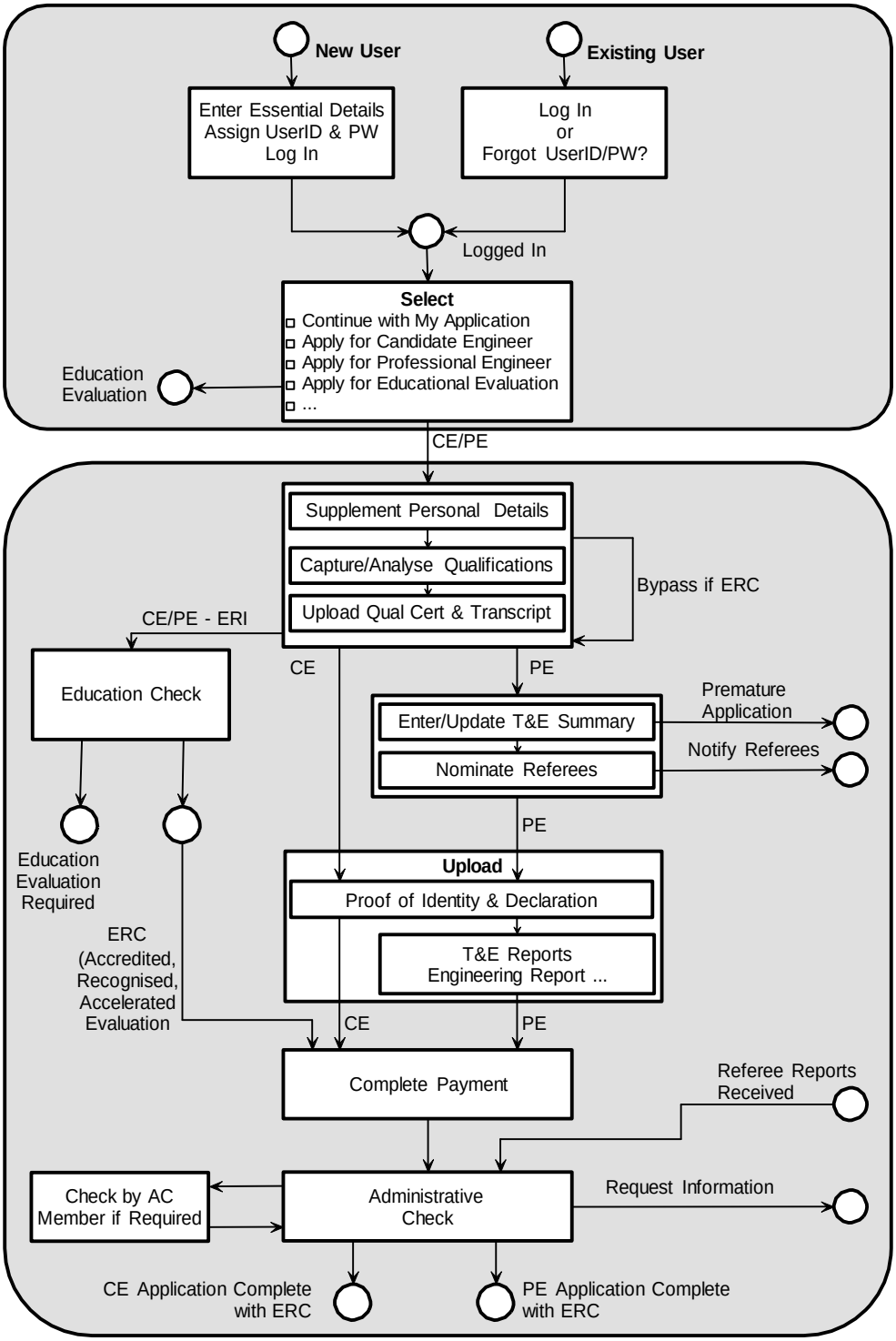

Figure 2: Common front-end and data entry for applications for Candidate Engineer and Professional Engineer

3.2. Data Entry System: Candidate and Professional Engineer

Applications for registration require pre-conditions to be fulfilled including payment of the prescribed fee, submission of the personal information, qualification, and supporting documents, which may include documents prepared by third parties, for example referee reports which are uploaded directly by the referees. The process described in Figure 1 ensures that the preconditions are fulfilled before the start of evaluation of the applicant's competence[1].

Applicants for Candidate Engineer (CE) and Professional Engineer (PE) are taken via the menu to the second part of Figure 2 where the following sub-processes occur:

- Provide the rest of their required information: addresses, employment, phone numbers, demographic information, andvoluntary association membership.
- Enter Qualifications with separate steps for:
  1. Accredited qualifications
  2. Washington Accord Qualifications
  3. Other Qualifications

In case 1, the qualification is selected from ECSA's database. In case 2 details are captured and confidence checks are performed (Country is a signatory, completion year in range of validity,..etc.). A status Provisional ERC is issued, with a disclaimer that the qualifications will be checked at a later stage.

In all cases, the applicant now uploads certified copies of degree certificate(s) and transcript(s). In cases 1 and 2, the parallel qualifications check process is launched for peer verification of the qualifications. In case 3, the details of qualifications are captured and the applicant is referred to the educational evaluation process.

An applicant for Professional Engineer then enters the Training and Experience Summary (TES) information online. A simple check on the number of weeks at different levels is used to detect premature applicants. An applicant who is warned of the premature nature of application may re-enter when further information on further experience is available.

The PE applicant then nominates Referees who are notified directly by the system. The Applicant must provide full details of Referees who are not registered with ECSA.

In the next phase required documents are uploaded: Proof of Identity, Declaration, Training and Experience Reports and Engineering Report.

Payment is completed online.

The referees complete their reports and upload the reports using their logins,

The application, including the referee reports, is checked by a registration officer. Incomplete information must be supplied by the applicant via the Continue My Application option. When the application is judged complete and the Education Check has returned an ERC and the referee reports

[1] Note: An applicant re-entering the system and choosing "Continue with my application" will be taken to the next piece of missing information.

have been completed, the application is marked as complete. The application is progressed to the next stage.

Note: Figures 2 and 3 do not show the mechanisms for detecting when the completion of a step is incomplete and the notifications that are sent.

3.3 Core Process for Candidate and Professional Engineer

The process in figure 3 gives effect to section 6 of the registration policy R-01-P. The Evaluators for the experience appraisal are selected and the appraisal starts. A provisional selection of reviewers and date for the Professional Review are established (to be confirmed or cancelled later). This takes into account the period required to complete the Experience Appraisal.

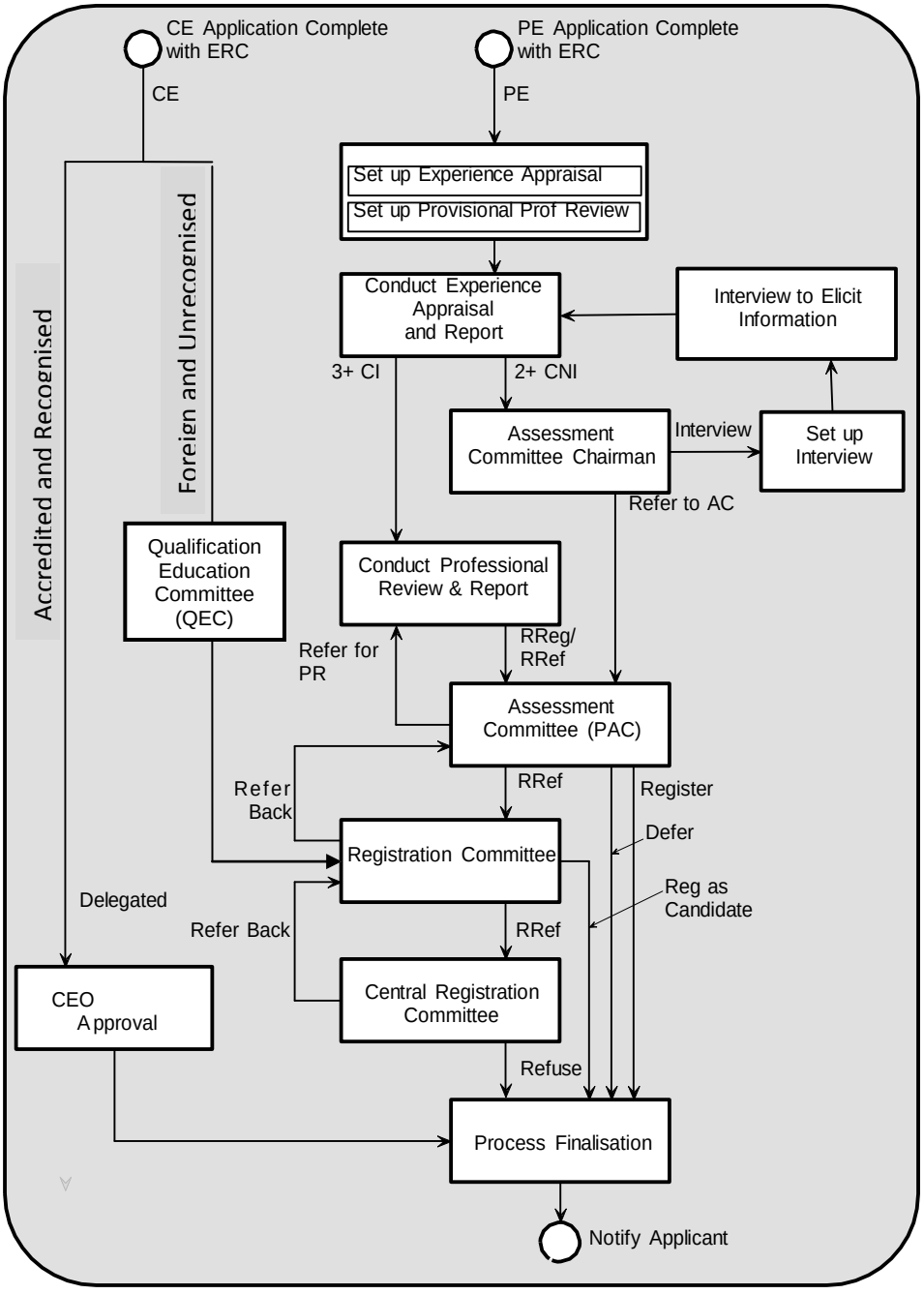

Figure 3: Assessment process for applications for Candidate and Professional Engineer

The process flow is in accordance with the policy of R-01-P section 6 and contains the following main elements.

1. Experience Appraisal: an assessment of the applicant's competence using the submitted documentation
   - If competence is indicated, proceed to professional review
   - If competence is not indicated, refer to the Professional Advisory Committee (PAC)
2. If the experience appraisal is not indicative of competency, the PAC Chairman reviews the appraisals and must adopt one of the following measures:
   - If further information is required, determine that the applicant be interviewed by the selected appraiser(s) to elicit further information. Further documents may be uploaded.
   - Refer the application to the PAC. In this case, the PAC may determine that the Professional Review should take place.
3. Professional Review
   - If competence is confirmed, recommend registration to PAC
   - If competence is not confirmed, recommend refusal registration to PAC
4. Consideration of reports by the Professional Advisory Committee with following possible outcomes:
   - Register applicant
   - Recommend refusal of applicant to the Engineers Registration Committee
   - Defer the application for up to 12 months to give the applicant the opportunity to gain experience to fulfill outstanding competency requirements subject to a maximum of two deferments.
6. If a refusal is recommended, the recommendations are considered by both the Engineers Registration Committee and the Central Registration Committee.

4. Evidence and Assessment for Registration as a Candidate Engineer or Professional Engineer

Table 2: Forms and Documents (Registration System To Be)

Ref	Components of Application	For Registration As	
		Candidate Engineer	Professional Engineer
	Online application form	X	X
	Declaration signed by applicant and Commissioner of Oaths	X	X
	Proof of Identity (SA ID book or Foreign Passport)	X	X*
TES	Summary of Training and Experience Reports		X
TER	Training and Experience Reports (Generally more than one) Individual Reports to be signed by supervisor. Training and Experience Outlines may be used where permitted		X
ER	Engineering Report (incorporating self-assessment).		X
IPD	Record of IPD (Pre registration CPD)(online)		X
	Proof of VA membership (Copy of certificate or letter)	X	X
	Qualification Certificates (if not already submitted)	X	X*
	Academic Record/transcript (List of Subjects and Grades)	X	X*
RR	Referee report, signed by referee (Generally two or more)		X
* If not already provided in a Candidate Engineer application			

4.1. General Requirement

The assessment system for applicants for registration as Professional Engineers must implement the requirement laid down in the competency standard R-02-PE section 2.1:

> *Competence must be demonstrated within complex engineering activities, …. by integrated performance of the outcomes … at the level defined for each outcome. Required contexts and functions may be specified in the applicable Discipline Specific Guidelines.*

The evidence used to demonstrate competency must therefore address the defined outcomes in the competency standard and indicate the level at which outcomes are achieved.

4.2. Information and Evidence of Competency to be provided

Table 2 lists the information and forms of evidence that the applicant for registration as a Candidate Engineer or Professional Engineer must provide.

4.3. Training and Experience Summary (TES)

The Training and Experience Summary (TES) is a record of distinct phases of training and work experience during the applicant's career up to the time of application.

TES must identify each phase of training and experience and the level of responsibility.

A phase of training and experience corresponds to a period in which particular high level training objectives are to be fulfilled or a major task or project is completed. A phase typically ends when new training objectives are set, the type of work changes, the expected level of achievement changes, employment is terminated or engineering work is interrupted. See Table 3 for a list of events that demarcate a period of training and experience.

The degrees of responsibility defined in document R-04-P, Table 4, are used here (and in the Training and Experience Reports**:**

A: Being Exposed	B: Assisting	C: Participating	D: Contributing	E: Performing

Degree of responsibility E means performing at the level required for registration. This corresponds to the range statement in outcome 10 in the Competency Standard R-02-PE which requires that the applicant display responsibility "for the outcomes of significant parts of one or more complex engineering activities".

4.4. Training and Experience Reports

Two templates are available for reporting on the applicant's training and experience and their use depends on the length and nature of that training and experience.

1. In general, an applicant must complete and submit a Training and Experience Report (TER) for each phase of training and work experience from graduation to application for registration. TER(s) covering at least one year working at the degree of engineering responsibility E (Performing) must be submitted. Such periods need not include the last period(s) in the applicant's TES.

2. The requirement in 1 is relaxed in the case of an applicant that has at least ten years training and experience after completing the educational requirement and reports at least three years at degree of engineering responsibility E (Performing) in detail in the TER format that are signed by the supervisor. Such periods need not include the last period(s) in the applicant's TES. Such an applicant may submit Training and Experience Outlines (TEO) for the remaining periods or groups of related periods.

Table 3: Information to be provided in Training and Experience Reports and Outlines

Aspect	Training and Experience Report (TER)	Training and Experience Outline (TEO)
Supervisor's signature	Required (indicates agreement with level of responsibility A-E inserted in header)	Not required – covered by general declaration by applicant
A period ends when:	• the work environment has changed, e.g. when a major training phase, task or ends; • the type of work has changed; • the responsibilities or level of function have changed (for instance, as in a promotion); • change of employer; • training or employment is interrupted (for instance by study, unemployment or prolonged illness).	• The level of responsibility changes from level B to C • The level of responsibility changes from level D to E • A promotion takes place • Change of employment • training or employment is interrupted • nature of work changes significantly
Position in Organisation	• Supply an organogram, showing supervisor(s), co-workers and those you supervised (if any). Show two levels above and below, if these exist.	• Simplified organogram: Identify yourself, your supervisor and state the number and level of persons supervised
Reporting Format	• Write in the first person. Construct proper paragraphs dealing with key aspects from the list below	• Use bulleted format covering the items below
Topics to be covered: elements marked * are mandatory, others as applicable	• Objective of training or major work phase*	• Nature of the training or work phase or related phases
	• Nature of problem(s) addressed* • Method of analysis* • Method of developing solution* • Criteria used in evaluating solution*	• Typical problems addressed*
	• Documentation, reports, presentations prepared • Interaction with clients, stakeholders and other disciplines • Management of materials, machines, manpower, methods or money • Contracts	• Responsibilities for communication and documentation • Management responsibilities
	• Health and safety considerations • Hazards and environmental considerations • Other legislation	• Legal and impact analysis
	• The applicant's contribution to the task* • Nature of the applicant's responsibility (in addition to level A-E)*	• Applicant's role and responsibility (in addition to level A-E)*
Length limit	300 words total (all TERs)	12 bullet points per TEO

Any applicant whose training and experience history is shorter than three years, and has less than one year working at degree of responsibility E (Performing) will be notified that the application is premature and invited to submit further TES as they become available.

Note: Where the person is registered as a candidate with ECSA, the TES can and should be updated online and the corresponding TER uploaded by the candidate as each the phase of training or work experience is completed.

The information to be provided in the TER and TEO format is defined in Table 3.

4.5 Engineering Report

Each Applicant must submit an Engineering Report covering aspects of work at the Perform level that demonstrates that the applicant has fulfilled the required outcomes. This report must be written for the purpose of the application. It is not a "simply report on a specific project". While it may be based on a major project or series of projects, it is a report in which the applicant reflects on his or her engineering activity that demonstrates the required level of competence. The work drawn on for the report does not have to be project based; in an operational engineering work environment, problem solving and engineering management may provide evidence of performance against the required outcomes.

The report should be reflective rather than purely narrative, covering:

- The engineering and contextual knowledge and understanding, both from the applicant's education and acquired subsequently, required for effective performance of the work.
- The theoretical and practical methods used to analyse and solve engineering problems encountered in the work.
- The planning, organising, leading and controlling of human and other resources required to achieve the goals of the engineering work.
- Handling of regulatory considerations, impacts of the work that were not necessarily covered by regulation and ethical issues, recognition of obligations to society, the profession and the environment.
- Risks and uncertainty associated with the work and its product.
- The recommendations, judgement calls and decisions that the applicant had to make, where the applicant's leadership skills exercised.
- The nature of the responsibility carried by the author and identification of the persons to whom the author was responsible.

The report must be written in the first person, in a proper structure, style and English language. A template for the heading and closure of the report is provided. The report body, including headings and sub-headings, must be in the range 2 500 to 3 500 words. Diagrams, tables and pictures appropriate to the purpose defined above, not exceeding two A4 pages in total area may be included (in addition to the word count). The report is a test of written communication ability both from a structural, stylistic and linguistic point of view as well as logical development.

4.7. Referee Report

The purpose of the Referee Report is to draw on observations of the applicant's performance in work conditions to obtain information on the applicant's competency. The referees are asked to identify

periods in the applicant's career as itemized in TES where the referee feels able to comment on the attributes of the applicant. In relation to these periods, the referee is asked:

- To rate the applicant's problem analysis and solution synthesis abilities in relation to the desired level (complex engineering problems);
- To rate the applicant's knowledge of engineering principles and of the wider context of the engineering work;
- To comment on the applicant's engineering management ability, that is the ability to ensure the achievement of engineering results through management methods;
- To rate the applicant's communication ability;
- To comment on the applicant's abilities to handle the regulatory, economic, social and environmental issues arising from engineering activity;
- To comment on the applicant's understanding of ethics and ethical behavior in relation to his engineering work;
- To rate the applicant's judgement in decision making and acceptance of responsibility;
- The applicant's willingness and capacity to accept responsibility; and
- To comment on the applicant's commitment and attention to competency and career development.

4.8. IPD Report

The Initial Professional Development (IPD) Report is a factual record that serves as evidence of proficiency development through CPD-type activities of Category 1 and other formal learning activities prior to registration.

5. Process for Educational Evaluation

The blocks Capture and Analyse Qualifications and Education Check in figure 1 are expanded in more detail in figure 4.

The education evaluation process is shown in Figure 5. This is a stand-alone process that may be entered from the menu in Figure 1. It requires documents to be uploaded and the evaluation fee to be paid.

The following documents must be uploaded by the applicant:

1. A curriculum analysis using the worksheet provided. This is an Excel worksheet where the applicant would enter data and upload a PDF version of the file.
2. Syllabi of the subjects studied. This would be scanned copies of relevant pages of the university handbook/rulebook or course descriptions as issued to the student.
3. Project report(s). These would be scanned copies.
4. Declaration and Proof of Identity.

The applicant must upload one set of items 1 to 3 for every qualification completed.

The applicant should be able to add documents relating to completion of learning of lesser extent than a full qualification. This would arise if an applicant completes further learning. This information is of the form:

1. Certification of completion of course/module and result achieved
2. Description of module including hours, breakdown of activity, syllabus, form of assessment

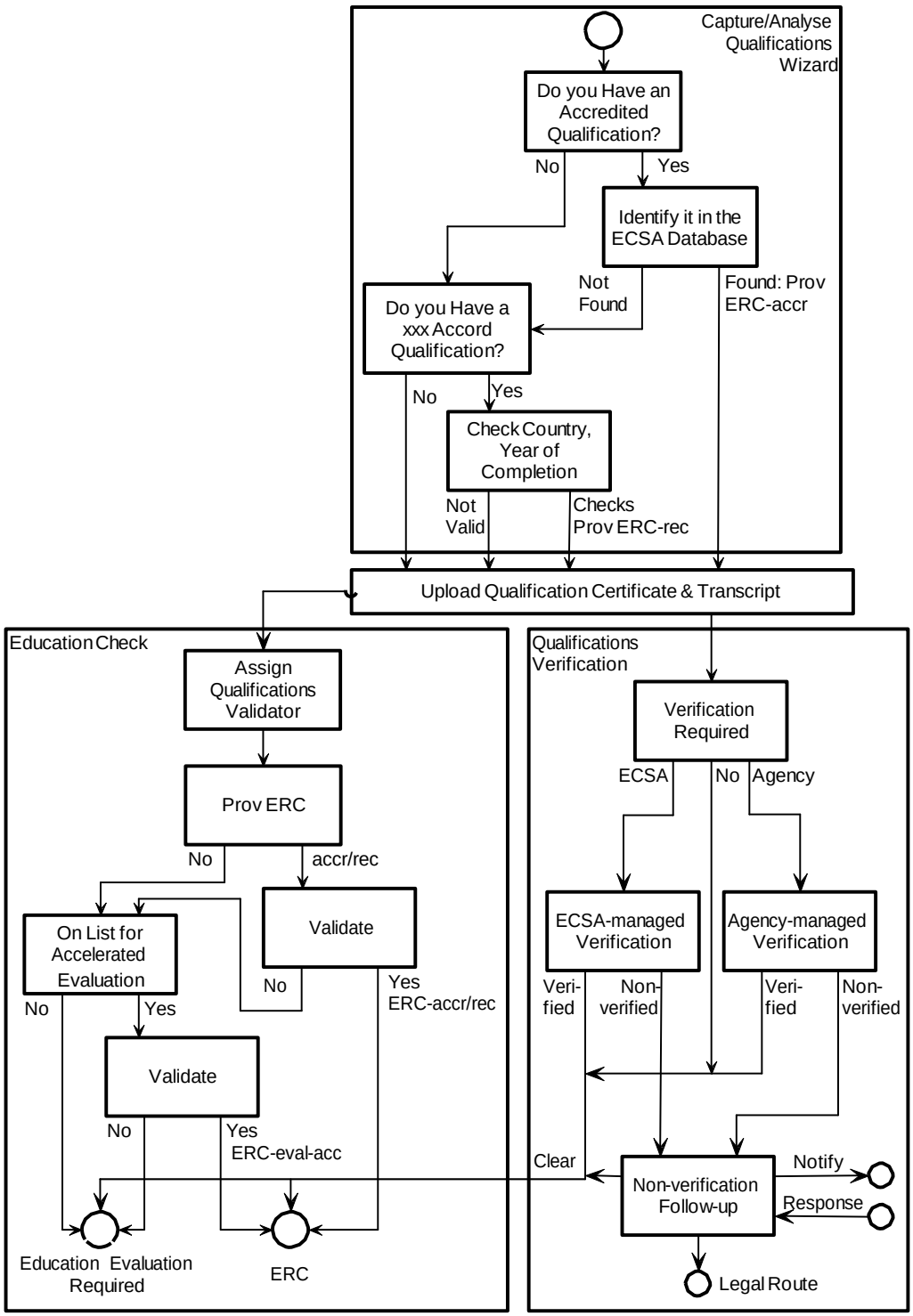

Figure 4: Detail of Capture/Analyse Qualification and Education Check in Figure 1

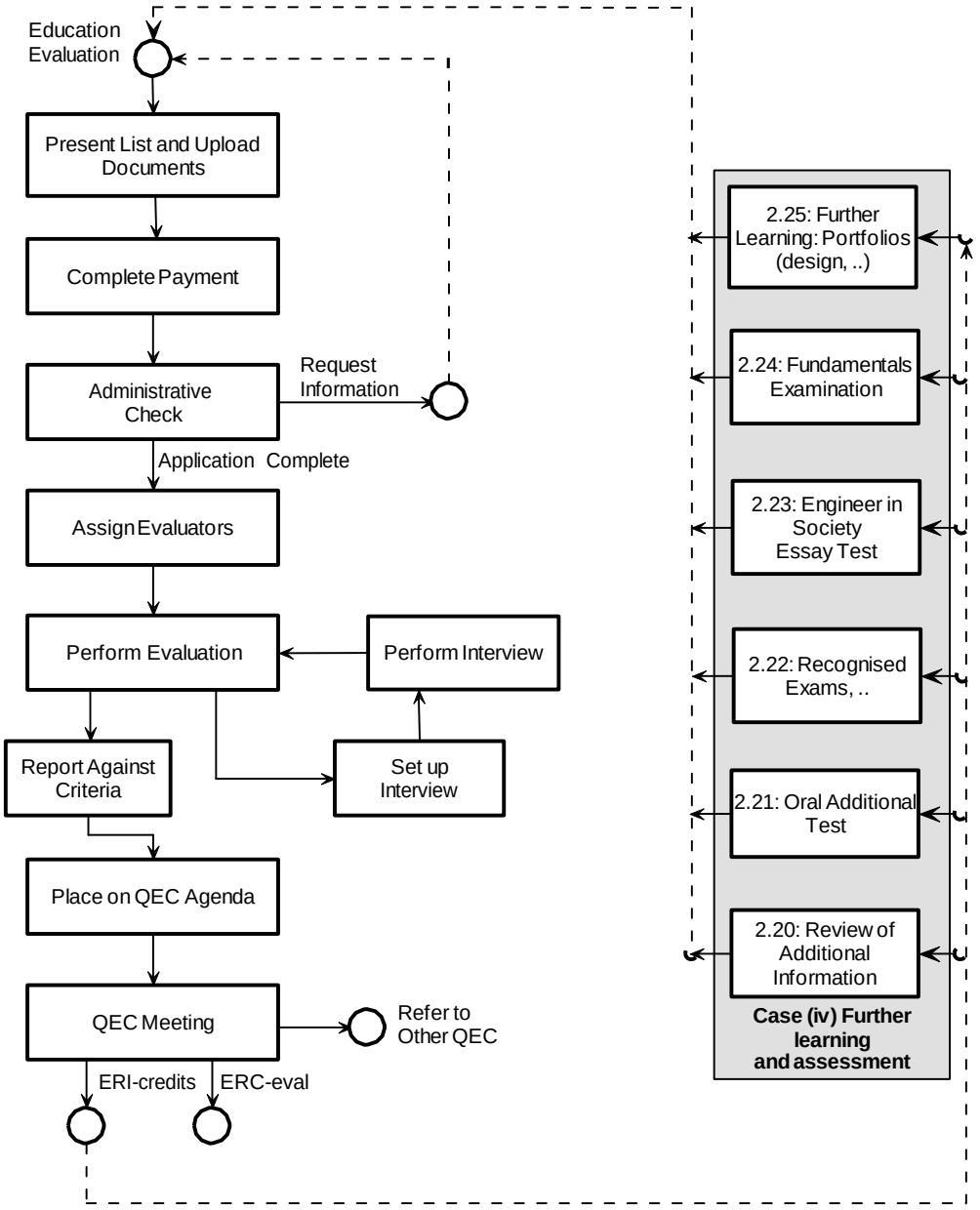

Figure 5: Education Evaluation process. The further learning and assessment elements are shown for completeness: they do not form part of the Educational Evaluation process.

Appendix A: What Changes with the introduction of Competency Standards?

Prior to the introduction of the competency standards, the requirements were expressed in terms of criteria for acceptable training in ECSA's policy document R2/1A. The requirements defined in section 5 of R2/1A are summarized in the first column of the following table. The outcomes embedded in the training requirements are extracted in column 2. The formal outcomes in R-02-PE are stated in column 3 while the level descriptor is in column 4. Table A1 relates to the Group A outcomes while table A2 relates to outcomes in Groups B, C and D.

Table A1: Transition from input-based training specifications to output-based competency specifications in Group A

<table>
<tr><th>1: R2/1A Essential Elements of Acceptable Practical Training</th><th>2: Outcomes Embedded in Training Elements in Column 1 or in DSG</th><th>3: Corresponding Competency Standard Outcome</th><th>4: Level descriptors for column 3</th></tr>
<tr><td colspan="2">Common requirement in section 1.1. of DSGs
Persons wishing to become registered as professional engineer must:
(ii) demonstrate that they have been trained to an acceptable level of competence in defined elements, for at least 3 years
(iii) display attributes of a professional person</td><td colspan="2">Requirement (R-02-PE Section 2.1.):
Competence must be demonstrated within complex engineering activities, defined below, by integrated performance of the outcomes defined below at the level defined for each outcome.
Note: Attributes of a professional person defined in outcomes</td></tr>
<tr><td rowspan="2">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.</td><td rowspan="2">The applicant must demonstrate the ability to:
Investigate engineering problems, [at a level] that require[s] engineering judgement, performing the functions: :
(a) identify and formulate a problem;
(b) find and select relevant information;
(c) evaluate, investigate, test and research;
(d) analyze all factors that influence the solution, including relevant engineering and scientific principles.</td><td>Group A: Engineering Problem Solving
1: Define, investigate and analyze complex engineering problems

Note: Engineering judgment is specified in Group D, outcome 8</td><td rowspan="3">Complex Engineering Problems have the following characteristics:
(a) require in-depth fundamental and specialized engineering knowledge
and one or more of the following:
(b) are ill-posed, unfamiliar, under- or overspecified, requiring identification and refinement,
(c) are high level problems including component parts or sub-problems;
(d) involve infrequently encountered issues;
and one or both of the following:
(e) solutions are not obvious, require originality or analysis based on fundamentals;
(f) are outside the scope of standards and codes;
(g) require information from variety of sources that is complex, abstract or incomplete;
(h) involves wide-ranging or conflicting issues: technical, engineering and interested or affected parties;.
and one or both of the following:
(i) require judgement in decision making in uncertain contexts;
(j) have significant consequences in a range of contexts</td></tr>
<tr><td>*3:-Comprehend and apply advanced knowledge: principles, specialist knowledge, jurisdictional and local knowledge</td></tr>
<tr><td>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.</td><td>The applicant must demonstrate the ability to:
Develop the suggested solution to the problem through a process of synthesis and design;
(a) apply all information acquired during the problem investigation,
(b) communicate by but not limited to drawing up of plans, detailed designs, reports, specifications,
(c) adjudicate tenders
(d) take into account all practical, economic, social, environmental, quality assurance, safety and statutory factors.</td><td>2:-Design or develop solutions to complex engineering problems

Note: Communication in outcome 5

Note: Impacts in Outcome 7</td></tr>
</table>

Table A2: Transition … in Groups B, C and D

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 utilization of people, materials, machines, equipment, means and funding with due regard for their interaction, to achieve the end result within the set parameters.	The applicant must demonstrate the ability to: a) Execute engineering tasks b) Make efficient use of people, materials, machines, equipment, and funding c) Handle interactions d) Achieve end results within set parameters **DSG 5.2:** demonstrate that their engineering work required them to: … understand and take into account financial, economic, commercial and statutory considerations **DSG 5.3:** must develop the ability to communicate lucidly, accurately and confidently **DSG 5.4:** must demonstrate [to their mentors] that they: • Understand the engineering procedures of the discipline • Know legislation applicable in engineering and to the discipline • Understand the Code of Conduct • Understand the role and relationships of [professional] organizations in their discipline • Are familiar with the requirements for registration	**Group B: Managing Engineering Activities** **4:-**Manage part or all of one or more ***complex engineering activities*** **5:-**Communicate clearly with others in the course of his or her engineering activities **Group C: Impacts of Engineering Activity** **6:-**Recognise and address the reasonably foreseeable social, cultural and environmental effects of *complex engineering activities* **7:-**Meet all legal and regulatory requirements and protect the health and safety of people in the course of his or her *complex engineering activities.*	***Complex engineering activities*** in which competence is exercised has several of the following characteristics a) *Scope* of activities may encompass entire complex engineering systems or complex subsystems *b)* A *context* that is complex and varying, is multidisciplinary, requires teamwork, and/or unpredictable, may need to be identified c) Requires diverse and significant *resources:* including people, money, equipment, materials, technologies d) Significant *interactions* exist between wide- ranging or conflicting technical, engineering or other issues **e)** Are *constrained* by time, finance, infrastructure, resources, facilities, standards & codes, applicable laws **f)** Have significant *risks* and *consequences* in a range of contexts
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	The applicant must demonstrate the ability to: a) Accept professional responsibility for taking engineering decisions. b) Ensure that sufficient cognisance is taken of economic considerations, social circumstances, environmental factors, quality assurance, safety and legal aspects. c) Follow the code of professional conduct **DSG 5.1:** must demonstrate ability to work satisfactorily on own and have taken responsibility and … have achieved a satisfactory outcome. **DSG 5.2:** demonstrate that their engineering work required them to: exercise independent technical judgement and accept responsibility.	**Group D: Exercise judgement, take responsibility and act ethically** **8:-**Conduct engineering activities ethically **9:-**Exercise sound judgement in the course of *complex engineering activities* **10:-**Be responsible for making decisions on part or all of *complex engineering activities* ***Group E: Manage Own Development** **11:-**Undertake professional development activities sufficient to maintain and extend his or her competence *No direct counterpart in R2/1A work requirements	

Appendix B: Sources of evidence against Outcomes

Note: *complex* is the level identifier defined for the Professional Engineer category in document R-02-PE

No	Outcome	Training and Experience Reports	Engineering Report Incl Self-assessment	Referee Reports (2)	CPD Report		Presentation	PR Interview	
A1	Define, investigate and analyze *complex engineering problems*	Factual/ Verified	Reflective/ Not Verified	Evaluative		**Information to the left is considered in the Experience Appraisal**		Evaluative/ Verified	**All information is used by Professional Reviewers when making their recommendation to the Assessing Committee (PAC)**
A2	Design or develop solutions to *complex engineering problems*	Factual/ Verified	Reflective/ Not Verified	Evaluative				Evaluative/ Verified	
A3	Comprehend and apply advanced knowledge: principles, specialist, jurisdictional and local	Factual/ Verified	Reflective/ Not Verified	Evaluative	Factual: Knowledge Enhancement			Evaluative/ Verified	
B4	Manage part or all of one or more *complex* engineering activities	Factual/ Verified	Reflective/ Not Verified	Evaluative				Evaluative/ Verified	
B5	Communicate clearly with others in the course of his or her engineering activities	Tests Concise Writing.	Tests analytical Writing	Evaluative			Tests synthesis, oral, graphic	Evaluative/ Verified	
C6	Recognize and address the reasonably foreseeable impacts of *complex* engineering activities	May not be covered	Reflective/ Not Verified	Evaluative				Evaluative/ Verified	
C7	Meet all legal and regulatory requirements and protect the health and safety of persons in the course of *complex* engineering activities	Factual/ Verified	Reflective/ Not Verified	Evaluative				Evaluative/ Verified	
D8	Conduct engineering activities ethically	May not be covered	Reflective/ Not Verified	Evaluative				Evaluative/ Verified	
D9	Exercise sound judgement in the course of *complex engineering activities*	May not be covered	Reflective/ Not Verified	Evaluative				Evaluative/ Verified	
D10	Be responsible for making decisions on part or all of *complex engineering activities*	Factual/ Verified	Reflective/ Not Verified	Evaluative				Evaluative/ Verified	
E11	Undertake professional development activities sufficient to maintain and extend his or her competence		Reflective/ Not Verified	Evaluative/ Verified (Commitment)	Factual			Evaluative/ Verified (Commitment)	

Appendix C: Training and Experience Summary

This information will be held in an online form containing the elements shown. Links will be provided to Training and Experience Reports.

No*	From	To	Weeks*	Work Details		Respon-sibility A-E	TER
1				Employed by:	Post Held:		LinkTER1
				Type of Work:			
2				Employed by:	Post Held:		LinkTER2
				Type of Work:			
...							
n				Employed by:	Post Held:		LinkTERn
				Type of Work:			

Appendix D: Training and Experience Report Format

The following template defines the elements (but not the exact format) of the Training and Experience Report.

<table>
<tr><td colspan="6">Engineering Council of South Africa
Training and Experience Report
as part of Application for Registration as Professional Engineer</td></tr>
<tr><td colspan="4">Applicant's Name:
Application Number:</td><td colspan="2">Applicant's Signature:</td><td>Date:</td></tr>
<tr><td>Period No.:</td><td>Start date:</td><td>End Date:</td><td>No. of Weeks:</td><td colspan="3">Position held:</td></tr>
<tr><td colspan="4" rowspan="2">Employer's Name and Address for this period[1]:</td><td colspan="2">Did you train under a Commitment and Undertaking (CU)?</td><td>Yes

No</td></tr>
<tr><td colspan="2">If yes, provide number of CU No.:</td><td>No.:
_____</td></tr>
<tr><td colspan="4">Supervisor's Name and Address:

ECSA Registration No.:</td><td colspan="3">Supervisor's Signature:

Date:</td></tr>
<tr><td colspan="7">Report:
Write in proper paragraphs in the first person singular. Compulsory paragraphs are shown as *. Other fields should be selected as required.</td></tr>
<tr><td colspan="7">*Nature and purpose of this period of training or experience:</td></tr>
<tr><td colspan="7">*Organogram showing two levels above and below applicant (if present), with individual's name and ECSA registration category, if registered. Identify the applicant's supervisor:</td></tr>
<tr><td colspan="7">*Nature of problem(s) addressed in this period; method of analysis, developing solution and evaluation, decisions and judgement:</td></tr>
<tr><td colspan="7">Documentation, reports, presentations prepared</td></tr>
<tr><td colspan="7">Management of materials, machines, manpower, methods or money, contracts</td></tr>
<tr><td colspan="7">Interaction with clients, stakeholders and other disciplines</td></tr>
<tr><td colspan="7">Health and safety considerations; hazards and environmental considerations; other legislation</td></tr>
</table>

*What outcomes and level were you working towards or demonstrating?:	
*Applicant's contribution to the work; nature and degree of the applicant's responsibility[2]:	Degree of Responsibility A-E

1: This is the employer and site at which the work took place, e.g. a site the applicant has been seconded to.

2: Use the scale A-E defined in section 4.3.

Appendix E: Training and Experience Outline

The following template defines the elements (but not the exact format) of the Training and Experience Outline.

<table>
<tr><td colspan="6">Engineering Council of South Africa
Training and Experience Outline
as part of Application for Registration as Professional Engineer</td></tr>
<tr><td colspan="4">Applicant's Name:
Application Number:</td><td>Applicant's Signature:</td><td>Date:</td></tr>
<tr><td>Period Numbers:</td><td>Start date:</td><td>End Date:</td><td>No. of Weeks:</td><td>Position(s) held:</td><td>Degree of responsibility:</td></tr>
<tr><td colspan="4" rowspan="2">Employer's and Supervisor Name and address:</td><td>Did you train under a Commitment and Undertaking (CU)?</td><td>Yes

No</td></tr>
<tr><td>If yes, provide number of CU No.:</td><td>No.:
_____</td></tr>
<tr><td colspan="6">Outline Report:
Use bulleted form. Compulsory elements are shown as *. Other fields should be selected as required.</td></tr>
<tr><td colspan="6">*Nature and purpose of period(s) of training or experience:</td></tr>
<tr><td colspan="6">*Organogram identifying yourself, your supervisor and persons supervised, with individuals' names and ECSA registration categories, if registered. Identify the applicant's supervisor:</td></tr>
<tr><td colspan="6">*Typical problems addressed and decisions made:</td></tr>
<tr><td colspan="6">Responsibility for communication and documentation</td></tr>
<tr><td colspan="6">Management responsibilities</td></tr>
<tr><td colspan="6">Health and safety considerations; hazards and environmental considerations; legal and other impacts</td></tr>
<tr><td colspan="5">*Applicant's role(s) and responsibilities:</td><td>Degree of Responsibility A-E</td></tr>
</table>

Appendix F: Referee Report

The following template defines the elements (but not the exact format) of the Referee Report.

Engineering Council of South Africa **Referee Report on an Applicant for Registration as Professional Engineer**					
Applicant's Name:	**Application Number:**				
Referee Name:	**Registration:**			**Registration Number:**	
Referee Employer and other details:					
My personal knowledge of the applicant's achievements extends:	**From:**			**To:**	
My personal relationship with the applicant is:	**Unrelated**		**By birth**		**By marriage**
My professional relationship with the applicant is, for the period(s) shown:	**Mentor**	**Supervisor**	**Employer**	**Colleague**	**Client**
I am conversant with the competency standard R-02-PE. I understand that the information will not be disclosed by ECSA unless required by Law. **I hereby declare that the information provided is correct to the best of my knowledge.**	**Referee's Signature:** **Date Completed:**				

Evaluation of the Applicant's Competence or state of Development:
The level of competency required for registration as a Professional Engineer is defined in the Competency Standards, document R-02-PE. Competency is defined in terms of eleven outcomes and two level definitions, namely *complex engineering problems* and *complex engineering activities*. The applicant is expected to have demonstrated performance at a degree of responsibility appropriate to a Professional Engineer for at least one year.

As a referee, you are asked to rate the applicant against the outcomes as well as make a holistic evaluation.
Please use the following scale:

CDC: The applicant consistently demonstrates competence
CDI: The applicant has demonstrated competence but not consistently
CNDD: The applicant has not demonstrated competence but is developing
CND: The applicant has not demonstrated competence
X: I am unable to comment

Please enter your comments in the third column, giving your reason(s) for assigning the particular rating. Where a rating CDI, CNDD, or CND is given, please clearly state the reason(s) for assigning this rating.

Outcomes	Rating	Reason
Group A: Engineering Problem Solving		
1: Define, investigate and analyse complex engineering problems		
2: Design or develop solutions to complex engineering problems		
3: Comprehend and apply advanced		

knowledge: principles, specialist knowledge, jurisdictional and local knowledge		
Group B: Management of Engineering Activities		
4: Manage part or all of one or more complex engineering activities		
5: Communicate clearly with others in the course of his or her engineering activities		
Group C: Impacts of Engineering Activity		
6: Recognize and address the reasonably foreseeable social, cultural and environmental effects of complex engineering activities		
7: Meet all legal and regulatory requirements and protect the health and safety of persons in the course of his or her complex engineering activities		
8: Conduct engineering activities ethically		
Group D: Exercise judgement, take responsibility		
9: Exercise sound judgment in the course of complex engineering activities		
10: Be responsible for making decisions on part or all of complex engineering activities		
Group E: CPD		
11: Undertake professional development activities sufficient to maintain and extend his or her competence		

Optional: Further comments or additional information on the Applicant:

Viewed Holistically:		
The applicant has demonstrated competence to be registered as a **Professional Engineer**		

Appendix G: Engineering Report Format

The following template defines the elements (but not the exact format) of the Engineering Report.

Engineering Council of South Africa

Engineering Report

as part of Application for Registration as Professional Engineer

Applicant:	**Application Number:**		**Self-evaluation**
In terms of my general declaration, I confirm that this report was written by me for the purpose of this application	**Signature:**		
	Date:	**Word Count:**	

Holistic Self Evaluation

Instructions:

1. This is a report in which the applicant reflects on his or her engineering development and proficiency achieved as exemplified by work completed. Work completed is not necessarily in a single project.
2. Write the report in conventional prose form, using the first person singular when describing your actions or thinking, in the space above.
3. Insert one heading or paragraph in each row. Do not insert boundary lines between rows.
4. Insert cross references to TERs by number where appropriate.
5. Against relevant paragraphs, insert annotations that indicate that the material shown provides evidence of competent performance. Use the following Notation:
   - A1, B2, C1 : The outcomes defined in R-02-PE demonstrated
   - CEP : Engineering Problem referred to meets Complex Engineering Problem descriptor
   - CEA : Engineering Activity referred to meets Complex Engineering Activity descriptor
   - DoR x : Degree of Responsibility x = degree from A to E (See R-03-P, section 4.3)
4. Observe the length limits of 2 500 to 3 500 words. Insert the word count (main column only) in the space provided. Diagrams, tables and other illustrations may be inserted in the main column but must not exceed a total more than two page heights. These are not included in the word count. The length limit (text and illustrations will be strictly enforced).
5. In the holistic self evaluation block, state in 200 words or less, why the information given above demonstrates that you are sufficiently competent to be registered as a Professional Engineer.
6. The instructions may be deleted when the report is completed.

Revision History

Version	Date	Status/Authorised by	Nature of Revision
Rev 1.0	25 Nov 2011	Council	
ECSA CONTROLLED COPY		**Executive: Policy Development and Standards Generation**	 John Cato **2016-08-17** Date