

ENGINEERING COUNCIL OF SOUTH AFRICA
IDENTIFICATION OF ENGINEERING WORK STEERING COMMITTEE
BASELINE REPORT

Final – 14 August 2005

This document details the reasons for the identification of engineering work and proposes a procedure to specify engineering work that needs to be reserved for Registered Engineering Persons making use of competency standards. A list of Identified Engineering Work functions to be reserved is also proposed. One of the main objectives of reserving identified engineering work for Registered Engineering Persons is to ensure that identified engineering work is only undertaken by competent engineering persons.

This document thus emphasises that:

- *All who wish to undertake identified engineering work must be registered;*
- *Once registered they should be permitted to practise their profession within the practice area which they can demonstrate they have evolved for themselves, while constantly updating their knowledge;*
- *The identified work undertaken by registered persons is thus reserved for them, and*
- *Those who are not registered should be prohibited from undertaking identified engineering work.*

1. INTRODUCTION AND BACKGROUND

The built environment is the physical world that has been intentionally created by humans through the application of science and technology in the control and use of forces and materials of nature for the benefit of mankind. Engineering work, described in Appendix 5, is essential to almost every aspect of society, national infrastructure and economic activity. Engineering work at its root involves one or more of the following: exploitation of natural resources; harnessing of energy for useful purposes; use of materials and substances with useful physical or chemical properties; use of machinery; structures; organization and control of complex systems or processes; construction and using engineering methods.

Engineering work, however, in attempting to serve society and economic activity, has in addition to its vast positive impact to society some *detrimental effects/risks/impacts*. The balancing of these positive and detrimental effects/risks/impacts on the health and safety of people, both the public and the workforce, on the physical environment and on sustainability for future generations is a very important function of the engineering practitioner. Safeguarding against the hazards associated with engineering work is not enough, engineering work must also be carried out effectively and efficiently.

One must thus ensure that engineering work is carried out both effectively and efficiently in the interests of delivering these economic and social benefits. In addition it is essential to ensure that adequate measures are taken to protect the health, safety and general interest of the public, including the workforce, to safeguard the environment and to ensure sustainability.

Three *mechanisms* are provided in the **Engineering Profession Act, 2000 (Act No 46 of 2000)** to ensure that these objectives are achieved:

- Registration of competent engineering professionals in defined categories;
- Identification of engineering work that may only be performed by a registered person, who takes responsibility for that work (and prohibits non-registered persons from taking such responsibility), and
- A disciplinary mechanism for investigating and sanctioning unprofessional conduct on the part of registered persons.

The objectives of *registration in a category* are to indicate to all interested and affected persons that:

- A person has been assessed by virtue of his education, training and experience as competent against the standards for the category: the person is proficient in both engineering work and the management of risks to persons and the environment;
- The person must work within the bounds of his/her competency;
- The person is required to maintain and extend his/her competency in order to maintain his or her registration;
- The person is committed to ethical practice and is subject to a code of conduct;
- The person is subject to the sanction of the Council for misconduct, and
- Persons who are not registered in a category may not carry out identified engineering work.

The regulation of the engineering profession and the associated identification of engineering work is, by nature, restrictive. However the main purpose of *identifying engineering work* to be reserved for registered engineering persons is to ensure that a person who performs that work is competent, ethical, and accountable and that there is recourse through the Council should the person fail to so perform the work

NOTE: Other persons, such as machine operators and artisans (Levels 1 to 4 on the NQF), are not covered by the Act and are thus excluded from the work reserved for registered engineering persons unless they fall under one of the categories covered by an appropriate specified category.

The *legal* objective set out in Section 26.(3) of the **Engineering Profession Act, 2000 (Act No 46 of 2000)**, states that “A person who is not registered in terms of this Act, may not – (a) Perform any kind of work identified for any category of registered persons ...”.

The *development of an engineering person in a category* is a continuous process and may have various pathways. The normal or benchmark route has the following sequence.

- Stage 1: primarily focused on engineering education with limited practical training, normally manifested in the form of an accredited qualification, and
- Stage 2: concerned primarily with developing engineering and supporting competencies in the workplace but also containing appropriate educational components. The required competencies are the minimum required by persons at the point of registration.

Competence of engineering professionals is generally accepted as the key to serving the public interest by balancing the negative impacts and maximising the effectiveness of engineering work.

In general, we recognize that an individual's competence at the point of registration is at least that identified by the standards against which a candidate for registration in the category is assessed. This competence in turn relies on the underpinnings of the relevant Stage 1 qualification.

Each engineering person, by the time of reaching the point of assessment against the Stage 2 standard, will have followed a programme of education, training and experience that may conform to an established pattern or may be distinctive. Subsequently, the individual develops by a process of experience and further learning, both formal and informal. Each individual therefore develops an area of knowledge and expertise that is distinctive.

This pattern of knowledge and expertise is termed the individual's *practice area*. A practice area is underpinned by generic competencies and contextual knowledge (content) and skills.

At any stage in an individual's career, accountability for competence is encapsulated in the *Code of Conduct* and in *Continuing Professional Development* requirements. The Code of Conduct prescribes that, registered persons:

- may not undertake or offer to undertake engineering work of a nature for which their education, training and experience have not rendered them competent to perform, and
- must provide work or services of a quality and scope, and to a level, which are commensurate with accepted standards and practices in the profession.

The term engineering team has been used to recognise the fact that the totality of engineering work requires a number of role-players, each with particular emphasis in their uniquely different competencies. The **Engineering Profession Act, 2000 (Act No 46 of 2000)** consistent with the notion of the engineering team, recognises four *categories* of registration as Professional, four as Candidate and Specified Categories as detailed in **Appendix 1**.

These are:

- Professional:
 - Professional Engineer;
 - Professional Engineering Technologist;
 - Professional Certificated Engineer, and
 - Professional Engineering Technician.
- Candidate:
 - Candidate Engineer;
 - Candidate Technologist;
 - Candidate Certificated Engineer, and
 - Candidate Technician.
- Specified Categories.

In all categories, the Council must register a person who demonstrates competence as specified by competency standards. The converse is also true: Council must not register a person who cannot demonstrate competency against the prescribed standards.

Educational and professional competency standards define the end result of education, training and experience in terms of demonstrable competent performance. The standards of competent performance are those agreed to by registered engineering peers and informed stakeholders to be required at the entry level to independent professional practice. **Professional Competency standards** based on the required educational underpinnings therefore provide a most logical and appropriate means of defining work that need to be performed by competent persons.

The process of standards generation for the levels of performance required at Stage 2 for each registration category, led to the development of level descriptors for the following:

- Type of engineering activities;
- Type of engineering problem solving;
- Required knowledge, both underpinning and directly applicable to job function;
- Required Skills, and
- Level of responsibility.

Engineering activities and problem solving are encapsulated for the four categories as follows (see definitions of these terms):

- For the Engineer, activities and problem solving are described as *complex*;
- For the Engineering Technologist, activities and problem solving are described as *broadly defined*;
- For the Certificated Engineer, activities and problem solving are described as *broadly defined* with specific additional requirements; this is still under consideration, and
- For the Engineering Technician, activities and problem solving are described as *well defined*.

Complex, broadly defined and well defined are shorthand for comprehensive descriptors developed in the standards generation process. The descriptors identify areas of overlap and differentiation in the level of performance in the four categories. These level descriptors describe the baseline for competent performance at Stage 2 and are given in the documents listed in **Appendix 6**.

ECSA documents have been developed specifying the *competency standards* required for the various categories. A list of these documents is given in **Appendix 6**.

A factor that has influenced the identification of engineering work for categories in the past is the widespread misapplication of engineering personnel, for example engineers as technologists and vice versa and technologists as technicians and vice versa. The standards are clear. The required level is determined by the requirements of competence, benchmarked internationally, for the category, not those achieved by the misapplication of individuals. Level descriptors are used to distinguish between the level of work which each category must be capable of performing – they are not intended to require that individuals must undertake work at that level.

The *minimum competencies* required to perform identified engineering work functions are defined in the Two-Stage System for Professional Development and given in ECSA Documents listed in **Appendix 6**.

These standards have been *benchmarked* through various international accords against the document “Graduate Attributes and Professional Competencies” dated 13 June 2005:

- The standards for Stage 1 Qualifications have been benchmarked and the quality assurance process verified as follows:
 - BEng/BSc(Eng) qualifications: through the Washington Accord;
 - BTech Qualifications: through the Sydney Accord;
 - National Diploma: through the Dublin Accord (standards only), and
- Professional level competency standards, Stage 2, are benchmarked against those of the Engineers’ Mobility Forum and the Engineering Technologists’ Mobility Forum.

The **Engineering Profession Act, 2000 (Act No 46 of 2000)** is very specific in **Section 18. (2)** that: “A person *may not practise* in any one of the categories contemplated in subsection (1), unless he or she is registered in that category”, and **Section 18. (3)** that: “A person may practice in a consulting capacity in the category in which he or she is registered”.

2. **PROCEDURE EMPLOYED TO DEVELOP THE PROPOSAL FOR THE IDoEW**

ECSA has very well developed policies and processes for the registration of competent persons in the various categories and an effective disciplinary mechanism for investigating and sanctioning unprofessional conduct on the part of registered persons. No such mechanism however exists for the identification of engineering work.

In order to comply with this requirement of identifying engineering work as called for in **The Engineering Profession Act, 2000 (Act No 46 of 2000)**, a Steering Committee, called the Identification of Engineering Work – Steering Committee (**IDoEW-SC**) was established to identify engineering work that needs to be reserved for Registered Engineering Persons.

The Terms of Reference of the IDoEW Steering Committee is given in **Appendix 2**.

A Reference Group has also been established to act as a sounding board and an extended consultation forum for the committee. The Reference Group consists of any person who declares his/her interest in contributing to the Identification of Engineering Work initiative without the obligation of having to attend meetings. Deliverables produced by the committee, even if provisional, may be made available to the Reference Group for comment. This will also go a long way towards the responsibility of ECSA in terms of **Section 26(1) of the Engineering Profession Act, 2000 (Act No 46 of 2000)** to consult.

The members of the **IDoEW-SC** and the Reference Group are listed in **Appendices 3 and 4** respectively.

3. **KEY DEFINITIONS**

The definitions of the terms used in this report are given in the various Acts and ECSA documentation. In order to clarify meanings of the terminology used certain important definitions are repeated below and described in detail where considered necessary in **Appendix 5**.

- 3.1. **Broadly defined Engineering Work** means work activities that require a practitioner with a minimum of the Stage 2 Engineering Technologist competencies to effectively perform that work.
- 3.2. **Candidate** means a person who is registered in terms of section 19(2) (b) of the **Engineering Profession Act, 2000 (Act No 46 of 2000)**.
- 3.3. **Competency standards** are standards specified per category and consist of Stage 2 competencies as defined in the standards supported by the Stage 1 underpinning knowledge together with additional knowledge and skills required in the work context.
- 3.4. **Complex Engineering Work** means work activities that require a practitioner with a minimum of the Stage 2 Engineer competencies to effectively perform that work.

- 3.5. **Identified Engineering Work** is engineering work that requires, for safe, environmentally acceptable, ethical and effective performance, the minimum level of competency defined in the standards for a category, together with such enhancements as are needed for that particular work.
- 3.6. **Practise** is to perform that work which is reserved for the categories contemplated in Section 18 of the Act.
- 3.7. **Practice Area** is that area of knowledge and expertise that each individual develops during his development that is distinctive to that person's particular work.
- 3.8. **Professional** means a person who is registered in terms of section 19(2) (a) of the **Engineering Profession Act, 2000 (Act No 46 of 2000)**.
- 3.9. A **Registered person** means a person who is registered under one of the categories referred to in section 18 of the **Engineering Profession Act, 2000 (Act No 46 of 2000)**.
- 3.10. **Registration** means a process of assessment of competency of applicants for the purpose of registration under the **Engineering Profession Act, 2000 (Act No 46 of 2000)**, and of entering the names of the applicants who qualify into a register.
- 3.11. **Responsibility** is the taking of rational, ethical engineering decisions without supervision, and under conditions that allow the decision-taker to be fully accountable for his or her decisions.
- 3.12. **Substantial** practice means the carrying out of most or all of the functions reserved for registered engineering professionals, while accepting overall responsibility for proper performance of such work.
- 3.13. **Sustainable Development** is the application of science and technology in the control and use of forces and materials of nature in such a manner that a better quality of life is provided for all, now and for generations to come.
- 3.14. **Well defined Engineering Work** means work activities that require a practitioner with a minimum of the Stage 2 Engineering Technician competencies to effectively perform that work.

4. **APPROACH TO THE IDENTIFICATION OF WORK**

Several bases exist for identifying types of engineering work:

- the *content* of the work, for example structural design, manufacturing,;
- the *context* of the work , for example in a consulting capacity, as an employee, in government service, and
- the required *competencies*, for example the level of problem solving.

It is recognized that identified work may be broad or specific. All cases require the generic competencies. The number of combinations of content and context are extremely large and it is impractical to attempt to define these cases under a general notice. Specific Acts may

provide for regulation in particular combinations of content and context. The approach to identification of work in this proposal is based solely on consideration of generic and broad *competence*. The approach is also based on separate identification for the categories of registration defined in the **Engineering Profession Act, 2000 (Act No 46 of 2000)**.

Engineering is the practice of science, engineering science and technology concerned with the solution of problems of economic importance and those essential to the progress of society. Solutions are reliant on basic scientific, mathematical and engineering knowledge. Solutions rely on analysis and synthesis, underpinned by sound techno-economic analysis. Solutions must take into account the needs of society, sustainability and the protection of the physical environment. Engineering work requires management and communication, and must be conducted ethically and within the bounds of applicable legislation.

Engineering work is essential to both economic activity and to national development. Engineering work, while offering such benefits also involves health, safety, environmental, economic and sustainability risks that must be managed. Effective, safe and sustainable engineering work is founded on the competence and integrity of engineering professionals.

Engineering thus involves activities or contributions to activities that serve economic, social or human needs, including:

- Designing materials, components, systems or processes;
- Planning the capacity and location of infrastructure;
- Investigating, advising and reporting on engineering problems;
- Improvement of materials, components, systems or processes;
- Managing or operating plant and processes;
- Managing implementation or construction projects;
- Implementing designs or solutions;
- Research, development and commercialization of products, and
- Education, training and development of engineering personnel.

where effective pursuit of these engineering activities is enabled by:

- The performance of problem solving, analysis, synthesis, evaluation, communication, self-management, teamwork;
- Application of specialist and fundamental engineering knowledge and technologies, underpinned by relevant fundamentals of basic science, engineering science and mathematics;
- Taking measures to safeguard the general and occupational safety, health and welfare of people;
- Ensuring that solutions are economic, sustainable and protect the environment;
- Using judgement, guided by engineering knowledge, in decision making; and,
- Effective employment of people, work processes and resources; while, at all times, the Professional;
- Adheres to the code of ethics, and
- Takes responsibility for the results of the work.

Management of projects is a fundamental aspect of all engineering work and is employed by engineering personnel of all disciplines in the performance of their daily tasks.

The practice of Engineering thus means the performance of one or more of the engineering activities requiring at least the level of competency defined for Stage 2 categories.

5. IDENTIFIED ENGINEERING WORK TO BE RESERVED

Considering the above definition of engineering and taking the minimum required competencies into account, the following **ENGINEERING WORK** that has an impact on public health, safety and the environment is identified as work that needs to be reserved for Registered Persons:

- a. Designs of materials, components, systems, plant or processes;
- b. Planning the capacity and location of infrastructure;
- c. Investigating, advising and reporting on engineering problems;
- d. Improvement of materials, components, systems, plant, equipment or processes;
- e. Managing, maintaining or operating plant, equipment and processes;
- f. Managing implementation or construction projects;
- g. Implementing designs or solutions;
- h. Research, development and commercialization of products;
- i. Management of Engineering Projects;
- j. Education, training and development of engineering candidates for Registration as Professionals;
- k. Planning and delivery of ECSA accredited engineering programmes and academic staff who are responsible for teaching and assessing engineering and professional exit level outcomes in ECSA accredited engineering programmes;
- l. Mentoring of Engineering Candidates and other applicants requiring registration;
- m. Work reserved for Engineering Persons by other Acts. See **Appendix 7**;
- n. Drafting and Approval of Mandatory Codes of Practice;
- o. Drafting and Approval of Engineering Standards;
- p. Management of the Risks associated with engineering systems, plant, equipment, processes infrastructure and fire;
- q. Assessment and Moderation in respect of Engineering Competencies, and
- r. The work of the Specified Categories who are required to be registered by legislation. (e.g. Lift Inspectors).

This above list of engineering work has been identified as work to be reserved for registered engineering persons. This list is by no means complete and will be added to from time to time. The work of other engineering workers, such as machine operators and artisans is not included in this list unless covered by a specified category.

6. EXEMPTIONS

Notwithstanding the aforementioned list which identifies engineering work to be reserved for persons registered with ECSA, the following persons may in the course of their profession perform overlapping functions which their education, training and experience have specifically rendered them competent to perform.

Persons registered by-

- (a) *South African Council for the Architectural Profession in terms of the Architectural Profession Act, No. 44 of 2000;*
- (b) *South African Council for the Landscape Architectural Profession in terms of the Landscape Architectural Profession Act, No. 45 of 2000;*
- (c) *South African Council for the Property Valuers Profession in terms of the Property Valuers Profession Act, No. 47 of 2000;*
- (d) *South African Council for the Project and Construction Management Profession in terms of the Project and Construction Management Act, No. 48 of 2000;*
- (e) *South African Council for the Quantity Surveying Profession in terms of the Quantity Surveying Profession Act, No. 49 of 2000;*
- (f) *South African Council for Planners in terms of the Planning Profession Act, No. 36 of 2002;*
- (g) *South African Council for the Natural Scientific Professions Act, No. 27 of 2003, and*
- (h) *South African Council for Professional and Technical Surveyors in terms of the Professional and Technical Surveyors' Act, No. 44 of 1984.*

This does away with the requirement of a competent person being registered with more than one professional council.

These provisions also apply in respect of a person registered as a candidate in terms of the relevant Act.

7. LIMITATIONS ON PRACTICE OF IDENTIFIED ENGINEERING WORK

Restrictions on practice in the various categories to registered persons is justified as an essential measure to ensure that engineering work is carried out effectively, safely, in an environmentally sound manner and with due regard to sustainability. These restrictions do not prevent persons who can demonstrate competency against the standards from becoming registered. Similarly, persons who can demonstrate Stage 1 competencies are not precluded from participating in candidature.

8. CONCLUSIONS AND RECOMMENDATIONS

The steering committee to date has developed a baseline report which:

- Sets out the reasons for the identification of engineering work to be reserved;
- Proposes a procedure to specify engineering work that needs to be reserved for Registered Engineering Persons making use of competency standards;
- Provides a list of generic Identified Engineering Functions to be reserved, and
- Documents the process which has been followed to date.

The next step is to prepare a **“Framework for the IDoEW”** document based upon the Council approved Baseline Report for the development of the regulations.

APPENDIX 1

APPLICABLE ACTS

1. In terms of Section 20 of the **Council for the Built Environment Act, 2000 (Act No 43 of 2000)**, the CBE must:

“(1) after receipt of the recommendations of the councils for the professions submitted to it in terms of the professions Acts, and before liaising with the Competition Commission in terms of section 4.(a)-

- (a) determine policy with regard to the identification of work for the different categories of registered persons;*
- (b) consult with any person, body or industry that may be affected by the identification of work in terms of this section.*

(2) The council must, after consultation with the Competition Commission, and in consultation with the councils for the professions, identify the scope of work for every category of registered persons.”

2. The following sections of the **Engineering Profession Act, 2000 (Act No 46 of 2000)** also refers:

Section 18(1) *“The categories in which a person may register in the engineering profession are-*

- a) professional, which is divided into-*
 - (i) Professional Engineer;*
 - (ii) Professional Engineering Technologist;*
 - (iii) Professional Certificated Engineer;*
 - (iv) Professional Engineering Technician; or*
- b) candidate, which is divided into-*
 - (i) Candidate Engineer;*
 - (ii) Candidate Engineering Technologist;*
 - (iii) Candidate Certificated Engineer;*
 - (iv) Candidate Engineering Technician; or*
- c) specified categories specified by council.*

(2) A person may not practice in any of the categories contemplated in subsection (1), unless he or she is registered in that category.

(3) A person may practice in a consulting capacity in the category in which he or she is registered.

(4) A person who is registered in the category of candidate must perform work in the engineering profession only under the supervision and control of a professional of a category as prescribed.”

Section 26. (1) *“The council must consult with-*

- (a) all voluntary associations;*
- (b) any person;*
- (c) any body; or*
- (d) any industry,*

*that may be affected by any laws regulating the built environment professions regarding the identification of the type of engineering work which may be performed by persons registered in any of the categories referred to in Section 18, including work which may fall within the scope of any other profession regulated by the professions' Acts referred to in the **Council for the Built Environment Act 2000.***

Section 26. (2) *“After the process of consultation the council must submit recommendations to the CBE regarding the work identified in terms of subsection (1), for its consideration and identification in terms of section 20 of the **Council for the Built Environment Act, 2000**”*

Section 26. (3) *“A person who is not registered in terms of the Act, may not-*

- (a) perform any kind of work identified for any category of registered persons;*
- (b) pretend to be, or in any manner hold or allow himself or herself to be held out as a person registered in terms of this Act;*
- (c) perform any act indicating, or calculated to lead persons to believe, that he or she is registered in terms of this Act.”*

Section 26. (4) *“Subsection (3) (a) may not be construed as prohibiting any persons from performing work identified in terms of this section, if such work is performed in the service of or by order of and under the direction, control, supervision of or in association with a registered person entitled to perform the work identified and who must assume responsibility for any work so performed”.*

APPENDIX 2

TERMS OF REFERENCE

TERMS-OF-REFERENCE: IDoEW STEERING COMMITTEE (IDoEW-SC)

1. Background

In terms of Section 20 of the **Council for the Built Environment Act, 2000 (Act No 43 of 2000)**, the CBE must:

- “(1) after receipt of the recommendations of the councils for the professions submitted to it in terms of the professions’ Acts, and before liaising with the Competition Commission in terms of section 4(q)-
- (a) determine policy with regard to the identification of work for the different categories of registered persons;
 - (b) consult with any person, body or industry that may be affected by the identification of work in terms of this section.
- (2) *The council must, after consultation with the Competition Commission, and in consultation with the councils for the professions, identify the scope of work for every category of registered persons.”*

The following sections of the **Engineering Profession Act, 2000 (Act No 46 of 2000)** refer:

Section 26.(1): *“The council must consult with-*

- (a) *all voluntary associations;*
- (b) *any person;*
- (c) *any body; or*
- (d) *any industry,*

that may be affected by any laws regulating the built environment professions regarding the identification of the type of engineering work which may be performed by persons registered in any of the

categories referred to in section 18, including work which may fall within the scope of any other profession regulated by the professions’ Acts referred to in the Council for the Built Environment Act, 2000.”

Section 26.(2): *“After the process of consultation the council must submit recommendations to the CBE regarding the work identified in terms of subsection (1), for its consideration and identification in terms of section 20 of the Council for the Built Environment Act, 2000.”*

Section 26.(3): *“A person who is not registered in terms of this Act, may not-*

- (a) *perform any kind of work identified for any category of registered persons;*
- (b) *pretend to be, or in any manner hold or allow himself or herself to be held out as a person registered in terms of this Act;*

- (c) use the name of any registered person or any name or title referred to in section 18 or 21; or
- (d) perform any act indicating, or calculated to lead persons to believe, that he or she is registered in terms of this Act.”

Section 26.(4):

“Subsection (3) (a) may not be construed as prohibiting any person from performing work identified in terms of this section, if such work is performed in the service of or by order of and under the direction, control, supervision of or in association with a registered person entitled to perform the work identified and who must assume responsibility for any work so performed.”

The ECSA Council has agreed to establish an IDoEW Steering Committee to champion the IDoEW process and to advise on any matters incidental to the IDoEW.

2. Desired Outcomes of IDoEW Project

The IDoEW Steering Committee will submit a section 26.(2) compliant Report as soon as possible to the Council of ECSA.

The Report is expected to contain recommendations regarding engineering work identified in terms of section 26.(1), inter alia inclusive of :

- engineering work reserved for competent registered engineering persons per registration category, and/or
- specific engineering work reserved for competent registered engineering persons, and/or
- engineering work reserved for specified registration categories referred to in section 18.(1) of the EPA 2000.

3. Name of Committee

The Committee is called the **IDoEW Steering Committee (IDoEW-SC)**.

4. Composition of the IDoEW-SC

The composition of the IDoEW-SC is as follows:

- one representative from each of the 8 recognised (main) engineering disciplines:
 - Mechanical / Aeronautical;
 - Agriculture;
 - Chemical;
 - Civil;
 - Electrical / Electronic;
 - Industrial;
 - Metallurgical, and
 - Mining

- Ex-officio ECSA members, inclusive of:
 - Mr Bob Pullen, President: ECSA;
 - Mr Paul Roux, CEO: ECSA;
 - Prof Hu Hanrahan, Consultant to the Engineering Standards Generating Body
 - Prof. Ravi Nayagar, Director: Strategic Development, ECSA, and
 - Mr Dirk J van Niekerk, Project coordinator (IDoEW Project)

NOTE: The ECSA Council has agreed to appoint Mr Dirk J van Niekerk as project coordinator for the IDoEW project.

- One each from other Stakeholder Groupings:
 - Engineering Technologists;
 - Certificated Engineers;
 - Engineering Technicians;
 - SA Association of Consulting Engineers (SAACE), and
- The committee may, on a needs-driven basis, co-opt persons to assist with the execution of its specified tasks and responsibilities.

5. Quorum

Since the IDoEW-SC is an advisory committee, quorum requirement do not apply.

6. Period of Establishment

The Committee is established as a sunset committee of the ECSA Council. To this end members of both the Committee as well as its Reference Group will be appointed for a period of one year, commencing with the inaugural meeting of the Committee. Members may be re-appointed.

7. Powers and Functions of the Committee

The Committee will attend to the following issues/aspects:

- Policy matters related to the IDoEW, e.g. Political intention of the Department of Public Works with compulsory registration;
- An appropriate consultation strategy for the IDoEW;
- An appropriate Game/Project Plan for the IDoEW project;
- Implementation/coordination/report back in respect of the approved consultation strategy for the IDoEW project;
- Advice / recommendations in respect of engineering work that need to be reserved for competent registered engineering persons, and
- Any other task incidental/related to the IDoEW project.
- The scope of engineering work e.g. broad, specific and per registration category;
- Reserved engineering roles/functions e.g. consulting engineering, and
- Engineering Work reserved under other legislation.

8. Chairperson

The Steering Committee may elect a chairperson from amongst the members of the committee.

When the chairperson is not present at a meeting, the members in attendance will nominate a person to act as chairperson for that meeting.

The chairperson's primary function is to preside over meetings of the committee and to assure the smooth functioning of the committee.

It is the responsibility of the Chairperson:

- to refer proposed policy issues for consideration / ratification / approval and mandating to the ECSA Council, and
- to report to the Council in respect of progress made with the IDoEW.

9. Facilitation and Coordination

The CEO of ECSA will assume overall responsibility for the activities of the Committee, supported by ECSA's Legal Department and the Director: Strategic Development.

The Project Coordinator will, in consultation with the CEO and his support staff, coordinate the activities of, and provide the necessary support for, the IDoEW-SC by:

- Advising on policy related issues impacting on the IDoEW;
- Providing the necessary and appropriate secretarial services to the chairperson and members of the IDoEW-SC;
- Preparing relevant documentation e.g. draft policy documents and submission of progress reports to the CEO and, if the Chairperson is not able to do so, to the ECSA Council, and
- Providing any other service assigned to him by the IDoEW-SC.

10. Reference Group and Task Teams of the Committee

A Reference Group (RG) has been established to act as a sound board, and extended consultation forum, for the Committee. The RG consists of any person who declares his/her interest in contributing to the IDoEW initiative without the obligation of having to attend meetings. Any deliverable produced by the Committee, even if provisional, may be made available to the RG for comment.

The Committee may establish ad-hoc (sunset) Task Teams (TTs) with such ToR and periods as the Committee may consider necessary to assist with the achievement of the desired outcomes of the Committee.

These TTs will be expected to make proposals and recommendations to the Committee. Members of such TTs will be selected for their competence (knowledge and experience).

The Committee is expected to provide TTs with a clear ToR which should include desirable outcomes.

11. Attendance at Meetings

Notwithstanding the extreme urgency attached to this initiative by the Department of Public Works and ECSA, the regularity of meetings of the Committee may be determined by the Committee on a needs-driven basis which may, initially at least, take place on a monthly basis.

It may be necessary to hold special meetings and/or workshops from time to time.

Where members are unable to attend Committee meetings or workshops, it will be incumbent on such member to arrange for an alternate (preferably from the RG) to attend, and to ensure that such alternate is provided with the necessary background to make a contribution to the meeting.

Members of the Reference Group will not be expected to attend the scheduled committee meetings unless co-opted to do so, or unless invited to attend workshops arranged by the IDoEW-SC. However, members of the Reference Group may attend regular meetings of the IDoEW-SC subject to the prior consent of the Chairperson.

Members are entitled to recover reasonable travel and subsistence expenses (including honoraria) incurred in the performance of their functions as members of the committee, which payments will be made in terms of ECSA's policy pertaining to the payment of committee members. As in the case of all committees of the Council, claims will be scrutinised, verified and authorised by the Director: Administration and Finance and his staff.

12. Notice Of Meeting

The Committee will adopt a year planner that reflects the meeting dates until completion of its task.

The Project Coordinator will ensure that members receive timeous (at least 10 working days) notice of Meetings.

The Project Coordinator will be responsible for circulating the agenda and supporting documentation at least five working days prior to the scheduled meeting date.

13. Funding of Committee Activities

The Committee will be funded from a budget appropriated by ECSA for this purpose. The Committees may only task companies and consultants to perform additional work, subject to prior approval from the CEO in consultation with his support staff.


14. Amendments to the Terms of Reference

The Council of the ECSA may, after consultation with the Committee, amend parts or all of these Terms of Reference (ToR). The Committee may of its own accord suggest amendments to the CEO for approval. In the event that the CEO considers the suggested amendments require the approval of the Council, the Executive Committee or the Finance Committee, as the case may be, he will refer such suggestion to the appropriate authority for approval

APPENDIX 3

MEMBERS OF STEERING COMMITTEE

<i>Engineering Discipline Constituency</i>	<i>Name of SC Member</i>	<i>Contact Details</i>	<i>Attendance</i>
Aerospace Engineering/ Mechanical Aeronautical Engineering	Potgieter, (P) Paul (Dr) (Charmaine-Secretary)	(T) (012) 662-5000 (C) (083) 326-7053 (E) c.nepgen@aerosud.co.za	
Agricultural Engineering	Du Plessis, (HLM) Rennie (Prof)	(T) (012) 420-3124 (C) 083 306 1398 (E) rennie.duplessis@up.ac.za	
Chemical Engineering	Lloyd, (PJD) Phillip (Dr)	(T) (021) 689-1386 (C) 083 441 5247 (E) plloyd@mweb.co.za	
Electrical/Electronic Engineering	Harker, (RA) Rod	(T) (021) 553-2632 (C) (082) 977-2097 (E) raharker@telkomsa.net	
Civil Engineering	Watermeyer, (RB) Ron	(T) (011) 402-4072 (C) (082) 460-5963 (E) watermeyer@sinc.co.za	
Industrial Engineering	Cilliers, (M) Michelle	(T) (011) 638-2952 / 373-6912 (C) (082) 467-4837 (E) mcilliers@angloamerican.co.za	
	Gunn, (R) Ralph	(T) Not available (C) Not available (E) ralph.gunn@acenet.co.za	
Metallurgical Engineering	Roode, (CA) Carel	(T) (018) 484-4485 (C) (082) 459-1323 (E) metenco@mweb.co.za	
	Valenta, (M) Mike	(T) (011) 239-5412 (C) (083) 357-2351 (E) MValenta@hatch.co.za	
Mining Engineering	Möhring, (RP) Rick	(T) (011) 486-4930 (C) (084) 586 6686 (E) moza62@mweb.co.za	
<i>Professional Category Constituency</i>	<i>Name of SC Member</i>	<i>Contact Details</i>	<i>Attendance</i>
Professional Certificated Engineer	Grobler, (du T) du Toit	(T) (011) 407-8431 – only if not available on cell (C) (083) 299-9242 (E) du.toit.grobler@sappi.com	
Engineering Technician	Moncur, (PS) Pat	(T) (012) 667-3347 (F) (012) 667-1718 (C) (083) 450 7434 (E) No e-mail address	
Engineering Technologist	Pitman, (BL) Brian	(T) (011) 609-3835 (C) 083 533 (E) cmpb@hixnet.co.za	
<i>Other Members</i>	<i>Name of SC Member</i>	<i>Contact Details</i>	<i>Attendance</i>
Consulting Engineering [SA Association of Consulting Engineers (SAACE)]	Evans, (IGW) Ivor (Chairperson: IDoEW-SC)	(T) (011) 808-3000 (C) (082) 559-7421 (E) igwevans@iafrica.com	
	Van Schalkwyk, (J) Johan	(T) (011) 463-2022 (C) (083) 788-2666 (E) johanv@saace.co.za	
<i>EC SA Functionaries</i>	<i>Name of SC Member</i>	<i>Contact Details</i>	<i>Attendance</i>

President, ECSA Council	Pullen, (RA) Bob	(T) (012) 421-3873 (C) (083) 625-7677 (E) bobp@bks.co.za /brendar@bks.co.za	
CeO, ECSA	Roux, (P) Paul	(T) (011) 607-9507 (C) (082) 788- (E) paulroux@ecsa.co.za	
ECSA (Director: Strategic Development)	Nayagar, (P) Ravi (Prof)	(T) (011) 607-9539 (C) (084) 420 4003 (E) profravi@ecsa.co.za	
ECSA LEGAL DEPARTMENT (Manager)	Faul, (A) Anthony	(T) (011) 607-9520 (C) (082) 569-5464 (E) legal@ecsa.co.za	
ECSA ADMIN DEPARTMENT (Director-Administration/Finance)	Naude, (E) Enslin	(T) (011) 607-9514 (C) (084) 616-0809 (E) enslin@ecsa.co.za	
ESGB Consultant	Hanrahan, (H) Hu (Prof)	(T) (011) 717-7243 (C) (082) 330-3528 (E) h.hanrahan@ee.wits.ac.za	
 Project Co-ordinator: IDoEW SIYAZI Consultants	Van Niekerk, (DJ) Dirk	(T) (012) 361-6996 (F) (012) 348-8065 (C) (083) 264-6224 (E) siyazi@telkomsa.net Room 141 Rynlal Building 320 The Hillside Lynnwood PRETORIA	

APPENDIX 4

<i>Engineering Discipline Constituency</i>	<i>Name of Reference Group Member</i>	<i>Contact Details</i>
Aerospace Engineering/ Mechanical Aeronautical Engineering	Basson, (AH) Anton (Prof) ★	(T) (021) 808-4250 (C) (082) 339-1091 (F) (021) 808-4958 (E) ahb@sun.ac.za
	Steyn, (JL) Jasper (Prof) ★	(T) (012) 420-2761 (C) (083) 263-3824 (E) jsteyn@postino.up.ac.za
	Van Niekerk, (JL) Wikus (Prof) ★	(T) (021) 808-4251 (C) (021) 808-4958 (E) wikus@sun.ac.za/wikus@inq.sun.ac.za
	Wesley, (EJ) John Brig Gen (Ret)	(T) (012) 661-7592 (F) (012) 661-9986 (C) (072) 246-5430 (E) johnwes@mweb.co.za/jwesley@csir.co.za
Agricultural Engineering	Crosby, (CT) Charles	(T) (012) 803-2870 (C) (083) 456-9489 (E) crossbee@mweb.co.za
	Murray, (TJ) Tim	(T) (033) 502-0114 (C) (083) 450-4294 (E) tim@fatacre.com
Chemical Engineering	Albertyn, Chris	(T) (012) 803-5142 (C) (083) 460-4178 (E) albertyn@lantic.net
	Coni, Nigel ★	(T) (011) 605-2129 (C) (082) 890-4268 (E) conin@ishecon.co.za
	Engelbrecht, Andre ★	(T) (011) 806-8885 (F) (011) 806-8907 (C) (082) 806-9298 (E) andree@aeci.co.za
Certificated Engineering	Members of the Registration Committee- Professional Certificated Engineers, c/o Ms Jenny Fuller, ECSA Registration Department ★	(T) (011) 607-9500 (C) (072) 152-4689 (E) jenny@ecsa.co.za
	Members of the Certificated Engineers SGG of the Engineering SGB, c/o Ms Lindy Martino, ECSA Standards Department	(T) (011) 607-9500 (C) - (E) standards@ecsa.co.za
	Townsend, (V) Vaughan ★	(T) (014) 569-6714 (C) (082) 572-0612 (E) Vaughan.Townsend@implats.co.za
	Letsolo, (O) Obed	(T) - (C) (082) 411-9344 (E) obby@icon.co.za
	Frauenstein, (C) Carolyn	(T) (035) 901-3111 (C) - (E) carollyne.frauenstein@rbm.co.za
	Ferguson, (T) Trevor	(T) (013) 689-3055 (C) (02) 496-1400 (E) Trevor.ferguson@bhpbilliton.com
	Bleeker, (MJ) Tienie	(T) (013) 687-9502 (C) (083) 325-4883 (E) tienieb@eyesizwe.co.za
	Carlos, (J) Jaco	(T) (012) 305-2555 (C) (083) 390-6233 (E) carlos.joao@debeersgroup.com
	Jennings, (RE) Richard	(T) (011) 376-3314 (C) (082) 335-2967 (E) richard.jennings@bhpbilliton.com
	Norden, (C) Charl	(T) (017) 614-3089/5085 (C) (082) 449-6828 (E) charl.norden@sasol.com
	Rauch, (L) Len	(T) - (C) (083) 284-2221 (E) len@iic.co.za
	Certificated Engineering	Viljoen, (PJ) Piet
Whibley, (A) Andrew		(T) (018) 781-8022 (C) (082) 655-5087 (E) andrew.whibley@goldfields.co.za

Civil Engineering	Deeks, (MRD) Mike	(T) (011) 456-1489 (C) (083) 628-5982 (E) mike.deeks@murrob.com
	Onsongo, (WM) Winston	(T) (011) 717-7035 (C) (0852) 409-8171 (E) onsongo@egoli.min.wits.ac.za
	Lawless, (A) Allyson (Me) ★	(T) (011) 476-4100 (F) (011) 678-7518 (C) (082) 449-2184 (E) allyson@ally.co.za
Electrical/Electronic/ Computer Engineering	Ballot, (PC) Pierre	(T) (011) 476-2279 (C) (082) 893-2804 (E) pierre.ballot@srkturgis.co.za
	Coney, (RG) Ronald	(T) (011) 466-1178 (C) (083) 800-2057 (E) ron.coney@kec.co.za
	Erasmus, (P) Philip ★	(T) (012) 358-0323 (C) (083) 324-8804 (E) philipe@tshwane.gov.za
	Gosling, (JW) John ★	(T) (011) 800-3852/4925 (C) (083) 653-2460 (E) John.Gosling@eskom.co.za
	Gow, (M) Malcolm ★	(T) (012) 991-8095 (C) (082) 894-2727 (E) gowmt@telkomsa.net
	Lakmeharan, (K) Kannan ★	(T) (011) 871-3370 (C) (083) 287-0228 (E) kannan.lakmeharan@eskom.co.za
	Lacquet, (B) Bea (Prof) ★	(T) (011) 717-7205 (C) (082) 803-1816 (E) b.lacquet@ee.wits.ac.za
	Leuschner, (FW) Wilhelm (Prof)	(T) (012) 420-2164 (C) (082) 413-1030 (E) leuschner@eng.up.ac.za
	Nel, (V) Viv ★	(T) (011) 787-9706 (C) TBA (E) engineer@netactive.co.za
	Ramjee, (K) Ken ★	(T) (041) 457-3036 (C) TBA (E) s8400199@nmmu.ac.za
	Trengove, (E) Estelle ★	(T) (011) 717-7230 (C) (082) 337-5548 (E) e.trengove@ee.wits.ac.za
	Vermaak, (H) Herman ★	(T) (051) 507-3453 (F) (051) 507-3254 (E) hvermaak@cut.ac.za
	Wedderburn, (R) Ron ★	(T) (033) 330-8412 (C) (083) 735-8080 (E) ronwedd@netactive.co.za
Industrial Engineering	Claasen, (SJ) Schalk (Prof)	(T) (012) 420-2433/3762 (C) (082) 908-3347 (E) schalk.claasen@eng.up.ac.za
	Reyneke, (R) Robbie	(T) (021) 886-6210 (F) (021) 887 8242 (C) (083) 658-1383 (E) profrob@mweb.co.za
Marine Mining	Smit, (S) Sandy ★	(T) (027) 217-1157 (C) (083) 310-6545 (E) sandys@transex.co.za
Metallurgical Engineering	Barcza, (NA) Nic (Dr)	(T) (011) 709-4680/4908 (C) (082) 574-6682 (E) nab@msinfo.mintek.ac.za
Metallurgical Engineering	Beck, (RD) Richard	(T) (011) 745-1522 (C) (082) 654-6818 (E) beck@icon.co.za
	Cramer, (LA) Larry	(T) (011) 373 6303 (F) (011) 834 2376 (C) (083) 627-0416 (E) larry_cramer@hotmail.com
	Van Niekerk, (WH) Willem (Dr)	(T) (011) 812-9512 (F) (011) 368-3293 (C) (083) 609-1042 (E) willem.vanniekerk@kumbaresources.com

	Dempsey, (P) Paul ★	(T) (011) 638 3009 (F) (011) 638 4740 (C) Not available (E) pdempsey@angloamerican.co.za
Mining Engineering	Cruise, (JA) John	(T) (011) 802-5145 (F) (011) 368-3293 (C) (082) 451-9829 (E) miners@global.co.za
	Phyllis, (RCD) Rudi	(T) (011) 832-2200/1-7 (F) (011) 832-2208 (C) (082) 331-9404 (E) rudyp@vebo.co.za
	Van der Merwe, (JN) Nielen (Prof) ★	(T) (012) 420-2443 (C) (082) 451-4895 (E) nielen@postino.up.ac.za
	Egerton, (FMG) Frank	(T) (011) 471-2692 (C) (083) 555-5058 (E) fegerton@telkomsa.net
	Rakale, (MH) Hawk	(T) (017) 631-1068 (C) (082) 457-6857 (E) mhrakale@wol.co.za
	Herrick, (N) Neil	(T) (011) 411-8002 (C) (082) 652-0534 (E) neil.herrick@goldfields.co.za
	Sutherland, (CJ) Neels	(T) (057) 733-8446 (C) (083) 256-9841 (E) neels.sutherland@goldfields.co.za

APPENDIX 5

DESCRIPTIONS

1. Engineering Categories

The Engineering Categories covered in the E P Act are:

1.1 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 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.

1.2 Professional Engineering Technologist

The Professional Engineering Technologist applies current engineering technology with creativity and innovation. A technologist has significant expertise and depth of knowledge in an area of technology. The technologist brings to an engineering problem leadership, management and a technologically specific approach, supported by financial, commercial, statutory, safety, and environmental knowledge as required. The technologist manages interactions within and at the boundaries of the technology domain.

1.3 Professional Certificated Engineer

The Professional Certificated Engineer is an experienced holder of at least one of seven (7) Government Certificates of Competency as Electrical or Mechanical Engineer, as Mine Manager or as Chief Engineer Officer –Foreign-going and is proficient in the effective and safe design, installation, operation, maintenance, continuous improvement and / or optimisation of machinery, equipment, installations, plant and processes which requires sound engineering judgement, problem solving skills, the ability to work in a team, and sound communication and management skills, in specific contexts: factories, installations generating, converting, transmitting and consuming all forms of energy, mines and works and on ships.

1.4 Professional Engineering Technician

The Professional Engineering Technician, or a technician of equivalent competency applies established procedures, practices and codes in support of engineering activities and manages defined engineering operations and processes and in the implementation of engineering systems and solutions.

1.5 Specified Scope Practitioner

The Specified Scope Practitioner is a holder of a specific qualification and development (duTG 20050703) and is therefore proficient (competent?)(duTG 20050703) to perform engineering (duTG 20050703) functions in a specific context that for health, safety, environmental or sustainability reasons need to be regulated.

2. Broadly defined Engineering Work

Broadly defined engineering work means work activities that require a practitioner with a minimum of the Stage 2 Engineering Technologist competencies to effectively perform that work.

Each engineering technologist, by the time of reaching the point of assessment against this standard, will have followed a programme of education, training and experience that may conform to an established pattern or may be distinctive. Each individual therefore develops an area of knowledge and expertise that may be distinctive. This pattern of knowledge and expertise is termed the individual's *practice area*.

Broadly-defined Engineering Activities: are characterized by several or all of:

- *Activities* involve one or more of: design; planning; investigation and problem resolution; improvement of materials, components, systems or processes; engineering operations; project management; research, development and commercialisation;
- *Boundaries* of practice area linked to technologies used, change by adoption of new technology into current practice;
- Practice area is located within a wider, complex *context*, requires teamwork, has interfaces to other parties and disciplines;
- Involve the use a variety *resources* (including people, money, equipment, materials, technologies), dealing with risks in practice area;
- Require resolution of occasional problems arising from *interactions* between wide-ranging or conflicting technical, engineering or other issues, and
- *Constrained* by available technology time, finance, infrastructure, resources, facilities, standards & codes, applicable laws.

Broadly-defined Engineering Problem: are characterized by several or all of:

- Requires underpinning knowledge and skills in the technology area;
- May encompass systems within complex engineering systems;
- Ill posed, under or over specified problems requiring identification and interpretation into practice area;
- Information from sources interfacing with practice area is complex and possibly incomplete, requires analysis and compilation into information base;
- Can be solved by structured analysis techniques;
- Involves a variety of factors which may impose conflicting constraints;
- Belong to families of problems which are solved in well-accepted and innovative ways;
- Problems may be partially outside standards and codes; operate outside with justification;
- Involves several groups of interested and affected parties with differing and occasionally conflicting needs;

- Have significant consequences which are important in practice, but may extend more widely, and
- Requires judgment in decision making, in practice area, considering interfaces to other areas.

Knowledge:

- As required for practice area, a selection of: law of contract, Health and Safety, intellectual property, Environmental, contract administration, quality management, hazard & operability study, project management, maintenance management, project & construction management;
- Working knowledge of interacting disciplines/technologies (engineering and other) to underpin teamwork;
- Experience of a range of broadly-defined engineering activities in the practice area, and
- Understanding and acceptance of taking responsibility within broad parameters and functions and behaving ethically.

3. Complex Engineering Work

Complex engineering work means work activities that require a practitioner with a minimum of the Stage 2 Engineer competencies to effectively perform that work.

Each engineer, by the time of reaching the point of assessment against this standard, will have followed a programme of education, training and experience that may conform to an established pattern or may be distinctive. Each individual therefore develops an area of knowledge and expertise that may be distinctive. This pattern of knowledge and expertise is termed the individual's *practice area*.

Complex Engineering Activities: are characterized by several or all of the following:

- *Activities* involve one or more of: design; planning; investigation and problem resolution; improvement of materials, components, systems or processes; engineering operations; project management; research, development and commercialisation;
- *Boundaries* of practice area change over time, formulate new engineering principles, new procedures, standards or codes, or advancing engineering practice;
- *Context* is complex and varying, is multidisciplinary, requires teamwork, may be unpredictable and may need to be identified;
- Involve the use of diverse *resources* (including people, money, equipment, materials, and technologies), high risk or resource intensive projects;
- Require resolution of significant problems arising from *interactions* between wide-ranging or conflicting technical, engineering or other issues, and
- Are *constrained* by time, finance, infrastructure, resources, facilities, standards & codes, applicable laws.

Complex Engineering Problems are characterized by several or all of the following:

- Requires a fundamental and specialist underpinning knowledge;
- May encompass entire complex engineering systems or complex subsystems;
- Ill posed, unpredictable, under- or over specified problems, requiring identification and refinement;

- Information from variety of sources is complex, abstract and possibly incomplete & requires analysis, abstraction, structuring and evaluation;
- Have no obvious solution and require originality and analysis;
- Involves wide-ranging or conflicting technical, engineering and other issues
- Involve infrequently encountered issues;
- Problems may be outside those encompassed by standards and codes; operate outside where justified;
- Involves wide ranges of interested and affected parties with widely varying need;
- Have significant consequences in a range of contexts, and
- Requires judgment in decision making taking diverse factors into account.

Knowledge:

- Requires in-depth specialist knowledge in practice area that allows a fundamentals-based, first principles analytical, approach building models as required;
- As required for practice area, a selection of: law of contract, Health and Safety, Environmental, IPR, contract administration, quality management, risk management maintenance management, regulation, project & construction management, and
- Working knowledge of interacting disciplines (engineering and other) to underpin teamwork.

4. Practice

Practice means to work on an ongoing basis in one of the categories contemplated in section 18 of the Act, and included a person qualified in the engineering profession who is employed by any sphere of government or an educational institution.

From case law:

- A person is considered to be practicing if that person “substantially performs the work” that a particular professional would perform;
- The work of any professional consists of work that he/she was trained for and administrative work, and only when he/she does the professional work is it “practising”;
- When work is not done for gain it is not considered “practising”, and
- An employee who is a professional and who is employed by another professional is considered to “practise”.

The court had an opportunity to consider how often a person would have to do a certain task for that action to be considered “practising” but it did not make any decision.

5. Profession

Profession is an occupation in which an individual uses intellectual skill based on an established body of knowledge and practice to provide a specialised service in a defined area, exercising independent judgement in accordance with a code of ethics and in the public interest.

6. Professional Regulation

Professional regulation is to ensure the quality of professional services in the public interest. The regulation of a profession involves the setting of standards of professional qualifications and practice; the keeping of a Register of qualified persons and the award of titles; determining the conduct of registrants; the investigation of complaints and disciplinary sanctions for professional misconduct.

7. Well defined Engineering Work

Well defined engineering work means work activities that require a practitioner with a minimum of the Stage 2 Engineering Technician competencies to effectively perform that work.

Each engineering technician, by the time of reaching the point of assessment against this standard, will have followed a programme of education, training and experience that may conform to an established pattern or may be distinctive. Each individual therefore develops an area of knowledge and expertise that may be distinctive. This pattern of knowledge and expertise is termed the individual's *practice area*.

Well defined Engineering Activities: are characterized by:

- Contribute to one or more of: design; planning; investigation and problem resolution; improvement of materials, components, systems or processes; engineering operations; project management; project implementation; research, development and commercialisation;
- *Boundaries* of practice area defined by techniques applied; change by adopting new techniques into current practice; Opportunities to improve practise are referred to engineers or technologists or relevant stakeholders;
- Practice area is located within a wider, complex *context*, with well defined working relationships with other parties and disciplines;
- Work involves familiar, defined range of *resources* (including people, money, equipment, materials, technologies), risks are well defined;
- Require resolution of *interactions* manifested between specific technical factors with limited impact on wider issues, and
- *Constrained* by operational context, defined workpackage, time, finance, infrastructure, resources, facilities, standards & codes, applicable Laws.

Well defined Engineering Problems: are characterized by:

- Are discrete, focussed tasks within engineering systems;
- Problems are routine, may be unfamiliar but in familiar context; problem definitions require clarification;
- Information is concrete and largely complete, but requires checking and possible supplementation;
- Can be solved in standardized or prescribed ways;
- Involve several issues but with few of these imposing conflicting constraints;
- Are frequently encountered and thus familiar to most persons in the practice area;

- Problems are encompassed by standards, codes and documented procedures; only work outside their prescriptions with authorisation;
- Involve a limited range of interested and affected parties with differing needs;
- Have consequences which are locally important but not far reaching, and
- Requires practical judgment in practice area in evaluating solutions, considering interfaces to other role players.

Knowledge:

- Selection of: practical knowledge in applicable law, regulation, codes, quality systems, project management procedures, construction management, maintenance procedures, maintenance management;
- Working knowledge in disciplines requesting work and receiving outputs relating to pivotal contribution of techniques to the system (rather than detailed design), and
- Experience of a range of well-defined engineering activities in the practice area.

APPENDIX 6

ECSA STANDARDS DOCUMENTS

Document Number				Document Type
G-01				Background to the Standards and Procedures System
G-02				Guide to the Documentation System
G-03				System of Engineering Professional Development
G-04				Definition of Terms to Support the ECSA Standards and Procedures System
PE-10	PT-10	ET-10	CE-10	
PE-20	PT-20	ET-20	CE-20	Whole Qualification for Stage 2
PE-21	PT-21	ET-21	CE-21	Unit-standards Based Qualification for Stage 2
PE-22.01	PT-22.01	ET-22.01	CE-22.01	Unit Standard: Engineering Management
PE-22.02	PT-22.02	ET-22.02	CE-22.02	Unit Standard: Planning and Design
PE-22.03	PT-22.03	ET-22.03	CE-22.03	Unit Standard: Investigation and Reporting
PE-22.04	PT-22.04	ET-22.04	CE-22.04	Unit Standard: Implementation and Construction
PE-22.05	PT-22.05	ET-22.05	CE-22.05	Unit Standard: Engineering Operations
PE-22.06	PT-22.06	ET-22.06	CE-22.06	Unit Standard: (future)
PE-30	PT-30	ET-30	CE-30	Reserved for Assessment Policy and Practice
PE-40	PT-40	ET-40	CE-40	Reserved for Training and Mentoring Guidelines
PE-60	PT-60	ET-60		Background to accreditation of programmes
PE-61	PT-61	ET-61		Whole qualification Standard
PE-62	PT-62	ET-62		Used previously, now obsolete
PE-63	PT-63	ET-63		Unit Standards-based qualification (Future)
PE-63.01	PT-63.01	ET-63.01	CE-63.01	Unit Standard: (Future)
PE-63.02	PT-63.02	ET-63.02	CE-63.02	Unit Standard: (Future)
PE-63.03	PT-63.03	ET-63.03	CE-63.03	Unit Standard: (Future)
PE-63.04	PT-63.04	ET-63.04	CE-63.04	Unit Standard: (Future)
PE-70	PT-70	ET-70		Accreditation Policy and procedures
PE-71	PT-71	ET-71		Management of Accreditation Visit process
PE-73	PT-73	ET-73		Accreditation visit documentation requirements
PE-75	PT-75	ET-75		Evaluation forms for programmes

PE-76	PT-76	ET-76		Forms for use in documentation
U1 vs 8.4				Draft Level Descriptors

These documents are all available on the ECSA website.

APPENDIX 7 (duTG 20050703)

ENGINEERING WORK LEGALLY RESERVED FOR COMPETENT AND/OR PROFESSIONALLY REGISTERED PERSONS

7.1 EXAMPLES OF RESERVED WORK NOT REQUIRING PROFESSIONAL REGISTRATION.

1. The appointment of Certificated Electrical and Mechanical Engineers in terms of the Occupational Health and Safety Act, No 85 of 1993 and the Mines Health and Safety Act, No 29 of 1996 to be in charge of the safe installation, operation and maintenance of all plant and equipment where the installed power exceed prescribed installed power limits.
2. The licensing of accredited persons (Master Installation Electricians, Installation Electricians and Single Phase Electrical Testers) with the Department of Labour to carry out the issuing of Certificates of Compliance for electrical installations, whether industrial, business, commercial or residential, in terms of the Occupational Health and Safety Act, No 85 of 1993.
3. The inspection and certification during the installation or repair of vessels under pressure by Approved Inspection Authorities in terms of the Occupational Health and Safety Act, No 85 of 1993.
4. The appointment of Chief Engineer Officers – Foreign Going on a vessel with a registered power of no less than 3 000kW in terms of the Merchant Shipping Act, No 57 of 1951.
5. The appointment of Mine Managers and Certificated Engineers in terms of the Mines Health and Safety Act, No 29 of 1996.

7.2 EXAMPLES OF RESERVED WORK REQUIRING PROFESSIONAL REGISTRATION (COMPULSORY REGISTRATION)

1. The appointment of Registered Lift Inspectors, registered by the Engineering Council of South Africa (ESCA) in the specified category, Section 18(1)(c) of Engineering Profession Act No 46 of 2000, to carry out the statutory inspections of all lift installations in the country excluding those on mines, in terms of the Occupational Health and Safety Act, No 85 of 1993.
2. Numerous examples in terms of the Occupational Health and Safety Act, No 85 of 1993 of engineering work which is reserved for registered engineering professionals, to name but a few:
 - a. Reg 16. Transportation Plant: 16.2 Any person who wishes to use a transportation plant shall submit b. a certificate issued by a registered professional engineer..... that he has **checked the design.....**;

- b. Reg 15. Suspended Platform: 15.2 No contractor shall use .. a suspended platform unless b) ...in possession of a certificate of system **design issued** by a professional engineer, a professional certificated engineer or a professional technologist....;
 - c. Reg 8. Safeguarding of explosive workplace: 8.1 An employer shall ensure that c) ..all materials used in the construction of a danger building are of a **design approved** by a professional engineer...;
 - d. Reg 5. Licensing of explosive workplaces: 4.5 Any person applying for a license to manufacture explosives in the explosive workplace shall submit drawings setting forth the following e) ..Building plans **designed and approved** by a professional engineer, and
 - e. Reg 11. Excavation work 11.3 Every contractor who performs excavation work shall adequately shore (d) or brace (d) ...Provided that... b) ii)(b) where any uncertainty pertaining to the stability of the soil exist, the **decision** from a professional engineer or a professional technologist **competent in excavations**, shall be decisive
3. The responsibility for the safety of medium and large dams in terms of Section 9C(6) of the Water Act, No 54 of 1956 is reserved for Engineering Professionals registered with ECSA.
 4. National Building Regulations and Building Standards Act, 1977 and regulations, reserve certain work for a "competent person" which is defined as a professional person who is registered with ECSA.