

Growth by design: GPDP, CPD, accreditation and the Washington Accord in Papua New Guinea

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ABSTRACT: The Graduate Professional Development Programme (GPDP), Continuing Professional Development (CPD) Programme and accreditation are the essential components for the Institution of Engineers, in association with universities and employers in order to provide postgraduate training for sustainable growth and the development of the nation of Papua New Guinea (PNG). Satisfactory progress in these areas are required for the international recognition of professional engineers.

PAPUA NEW GUINEA

The Independent State of Papua New Guinea (PNG), situated in the South Pacific, is quite unique (see Figure 1). A small state in terms of population (5.2 million), PNG has a large land area of some 462,000 sq. km. Much of the area is mountainous and other limitations such as erosion make it difficult for Papua New Guinea to support a proportionately large population.

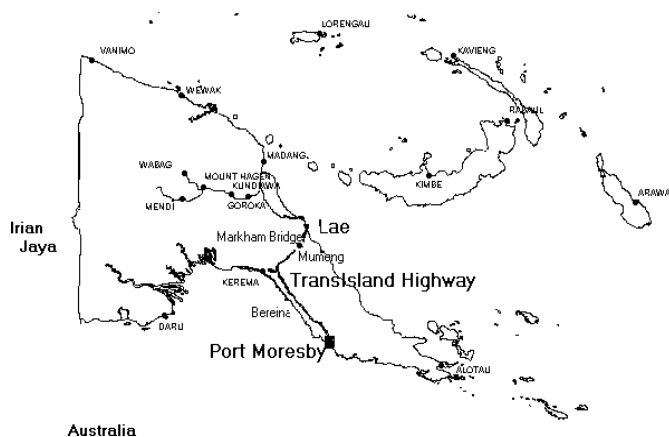


Figure 1: Map of Papua New Guinea.

In world terms, PNG is a provider of basic materials: minerals, plantation products, fish and timber. Only a fraction of the domestic population works for and depends on international trade. Semi-subsistence farming and small-holder agriculture production are the two predominant local economic bases.

However, PNG is blessed with significant mineral resources. The need for a strong and dedicated engineering workforce to develop the resources is acknowledged.

UNDERGRADUATE'S ROUTE TO THE PRACTICE OF ENGINEERING

The University of Technology (Unitech), Lae, Papua New Guinea, is the primary institution catering for technical education at the tertiary level in Papua New Guinea and other South Pacific countries, excluding Australia and New Zealand. On average, 480 graduates per year are produced in various disciplines, such as engineering, surveying, accountancy and natural sciences.

The minimum entry requirement for the engineering degree course at Unitech is above average passes in physics, chemistry, the English language and major mathematics at the National High School Certificate examination. The certificate, which also satisfies Australian university entrance requirements, is awarded to students based on a competitive examination following 12 years of primary and secondary schooling.

The engineering degree course at Unitech is of four years duration and includes a common foundation year. At the end of the foundation year, students are admitted to study one of the major branches of engineering offered, namely: civil, electrical, mechanical, mining or mineral processing [1].

Typically, 40 students are admitted to the second year course in each of the engineering departments, from which about 18 students graduate with a degree. The attrition rate is fairly high, probably because the departments, while appreciating the need to produce engineers in sufficient quantities to meet the national developmental goal, endeavour to maintain internationally acceptable academic standards. The high attrition rate has resulted in some departments awarding a diploma qualification to their academically less talented students.

Streamlining takes place at the end of second year. On successful completion of the engineering degree, graduates enter the professional engineering workforce as provisionally registered engineers.

In order to practice as an independent professional engineer in Papua New Guinea, one has to be registered with the Engineering Registration Board (ERB). The graduate has to become a Graduate Member of the Institution of Engineers of Papua New Guinea (IEPNG) and complete a Graduate Professional Development Programme (GPDP) of 4 to 7 years duration to obtain registration [2]. All Registered Engineers (Reg. Eng.) are encouraged to become Members of the Institution of Engineers of Papua New Guinea (MIEPNG)

THE ERB AND THE IEPNG

The Engineering Registration Board (ERB) is a legal entity that reports to the Minister for Works. The administration of the Board is the responsibility of the Institution of Engineers of Papua New Guinea (IEPNG). The President of the IEPNG is also the Chairman of the Engineers Registration Board, while the Executive Director of IEPNG is the Registrar to the ERB.

Localisation is an important and sensitive issue in Papua New Guinea. The present membership of IEPNG is about 1,000 of which nearly 24% are expatriates. The rapid growth in demand to train national graduates has placed onerous demands on the Institution of Engineers. Also, the employment of appropriately qualified expatriate engineers is essential to meet training requirements.

The Institution of Engineers, in order to ensure maintenance of quality and efficiency in the implementation of training and localisation, has introduced the following measures:

- Graduate Professional Development Programme (GPDP).
- Continuing Professional Development (CPD) Programme.
- Accreditation.
- International Recognition.

GRADUATE PROFESSIONAL DEVELOPMENT PROGRAMME (GPDP)

The Graduate Professional Development Programme (GPDP) was introduced in 1990. It is applicable for Unitech engineering graduates or those with equivalent qualifications. They are required to undergo a period of 4 to 7 years training prior to their election to corporate membership of the Institution.

The graduate will undertake the IEPNG approved programme of training, which will involve minimum specified attachments on site, in design office and in administration and management under the supervision of a registered engineer. The trainee is required to maintain detailed logs (to a format specified by the IEPNG) of training received, which will be regularly assessed by the IEPNG. The IEPNG has appointed a Graduate Development Officer to coordinate the training of graduates and report on the progress of the scheme.

Status of the GPDP Prior to the Revision

The GPDP is now in its 12th year of implementation and the IEPNG has recently introduced significant revisions to the

programme. The following shortcomings were identified regarding the previous programme:

- In several instances, there was no registered engineer suitably qualified to provide direction and to act as a mentor in the graduate's place of employment.
- Opportunities available for graduates to obtain accelerated promotion to directors and engineering managers had ceased. Current graduates need to obtain sufficient professional training so that they can adequately replace expatriate engineers undertaking professional engineering work.
- Even in the past, international recognition of PNG graduates has been difficult. For instance, there has been limited success in obtaining mutual recognition of PNG qualifications under the Washington Accord. At present, the situation is further exacerbated by increasing standards demanded by overseas professional institutions. For instance, the Institution of Civil Engineers (London) requires a MEng degree from their graduates while the Council of Engineering Institutions require an honours degree for chartered engineers. Qualifications for membership of other engineering institutions recognised under the Washington Accord are of equivalent or higher standing to that of the Council of Engineering Institutions.
- There were difficulties encountered in the recruitment and continued employment of a GPDP Officer.

The Revised GPDP

In order to satisfy the requirements for corporate membership (MIEPNG), and hence become a registered engineer (Reg. Eng.), a graduate should have satisfied criteria relating to training, specialisation and professional participation.

TRAINING

The graduate should have undergone GPDP training or be a mature candidate who has obtained the necessary experience assessed in terms of equivalent GPDP points.

A viable system of professional training has been approved. Under the revised programme, the Graduate Development Officer has been replaced by a Career Development Coordinator (CDC), whose role is to coordinate the GPDP programme while senior registered engineers play an active role as assessors. The approved format is given below:

- On admission of a candidate to the GPDP programme, a senior registered engineer is appointed as a confidential advisor to report on the graduate's progress and to offer advice to the candidate. Ideally, the assessor will not be the graduate's supervisor. The primary requirement is that the assessor should specialise in the same area as the graduate.
- Graduate trainees forward their training reports to the CDC for onward transmission to the advisor. The advisor will forward a written report, including a progressive numeric mark, on the graduate's progress towards the goal, together with necessary recommendations. The candidate will be informed of the contents of progress reports.
- A Continuing Progress Report (CPR) is to be maintained by the CDC for each graduate.

- A Continuing Progress Assessment (CPA) Committee, representing each major specialisation, examines CPRs in their area of specialisation. Annual recommendations are sent to the graduate and, where requested by the candidate, to their employer.
- Eligibility for application as a member and registered engineer is based on the recommendations of the CPA Committee.

Specialisation

The candidate should have obtained a level of specialisation typified by a minimum equivalent number of points. Points may be accumulated by satisfactorily completing relevant formal study modules or examinations in management, health and safety issues and in the area of specialisation of the candidate in his/her workplace. The candidate will be required to obtain such qualifications while employed by attending approved courses by part-time or distance learning mode (including assessment). The Institution will specify the relevant number of points accredited for the completion of each course or part of a course or other submission by the candidate.

Examples of courses are as follows:

- In-house training courses of suitable standard, such as those offered by the Works Training Centre of the Department of Works, provided they include a formal assessment component.
- Postgraduate certificate in management.
- The structural registration examination or other specialist examinations held by the Institution or other recognised professional institutions.
- Formal postgraduate certificates offered by Unitech or other institutions in professional subjects.
- Significant parts of the above programmes provided they are formally assessed.
- Research work undertaken for specific postgraduate degrees will not be accepted; however, papers accepted by internationally recognised journals and conference proceedings are acceptable.
- Articles accepted for publication in the Institution's conference proceedings, journals and newsletters is also acceptable, particularly where they relate to engineering works completed in Papua New Guinea or directly relate to the research needs of the country.

Professional Participation

The candidate should have demonstrated active interest in professional affairs by demonstrating active participation. The graduate should have participated to an acceptable level typified by a minimum equivalent number of points. Professional participation in this respect include the following:

- Attend technical meetings, seminars and conferences.
- Undertake activities to promote professional engineering in schools and among the public or contribute articles of engineering interest to the local media.
- Attend informal short courses and site visits
- Participate in institutional activities, such as being a branch committee member.
- Participate in community activities that call for engineering input.

- Participate in the activities of related professional institutions.

Advantages of Revisions to the GPDP

The advantages of the revisions to the GPDP are as follows:

- The need to obtain extra postgraduate qualifications helps graduates in the pursuit of gaining international recognition of their qualifications under the Washington Accord.
- It will assist better performance in employment by providing appropriate professional training and by keeping up to date with new developments.
- Given PNG's present declining economic climate, it is unrealistic to expect a large number of graduates to be sponsored to overseas countries to obtain specialist training. The proposals will encourage appropriate training opportunities to be developed by local institutions.
- A significant number of graduate engineers can expect to obtain little assistance from senior engineers in their place of employment. The proposals will provide the necessary assistance for graduates to pursue their specialisation in depth and appropriate training to obtain membership.
- The courses developed as a result of GPDP programmes will address more locally relevant issues compared with imported courses or courses offered to PNG students at overseas universities.
- The proposals will encourage more graduates to strive for higher degrees by distance learning mode.

PRESENT STATUS OF THE GPDP AND PROPOSED ENHANCEMENTS

At present, the Institution does not need CPD achievements for continued membership and registration, except in the case of structural registration. However, the Institution has provided several opportunities for members to participate in CPD programmes. These are as follows:

- Attending technical meetings, seminars or conferences.
- Contributing to technical journals and newsletters.
- Promoting professional engineering in schools and amongst the public or contributing articles of engineering interest to the local media.
- Pursuing specialist professional, postgraduate and management qualifications.
- Attending short courses.
- Participating in institutional activities, such as acting as a reviewer, a student liaison officer or advance professional engineering activities by serving as a Council or committee member.
- Mentoring for graduate engineers.
- Participating in the activities of related professional institutions.

A significant development in this respect is the establishment of the Federation of Technology Institutions in an attempt by member institutions to cooperate so as to improve efficiency and reduce costs in providing membership services. The Federation is comprised of the Institution of Engineers, Institute of Architects, Institute of Builders, Institute of Land Valuers and Administrators and the Association of Surveyors. The following advantages are expected to result from such cooperation.

- More effective representations and negotiations at national levels on policymaking and professional issues for the benefit of the community and members.
- Improved networking and efficiency in official negotiations resulting from established personal contacts and understanding.
- Improved understanding of the various professions and knowledge of advancing technology in associated specialisations. For example, insight into the application of geomatics can be particularly useful for civil engineers.

Advantages from Improvements to CPD Programmes

The advantages identified for graduates under the revised GPDP are also applicable to registered engineers, albeit to a varied extent. In addition, the following advantages are specific to senior engineers:

- It helps the profession and the personal standing in the community when engineers participate in community projects as part of their CPD Programme.
- At present, the top management positions are significantly filled. The next wave of localisation is based significantly in senior national engineers replacing expatriate engineers in professional practice. Effective localisation at this level needs specialisation and further professional training, ideally obtained by distance learning mode.
- The CPD requirement for registration renewal is a useful lever for senior engineers to obtain an adequate training budget from employers so as to fulfil requirements.

ACCREDITATION AND INTERNATIONAL RECOGNITION

The Washington Accord is an international agreement relating to degree programmes in engineering. The signatories of the Accord are bodies responsible for accrediting professional engineering degree programmes in the relevant countries. After a comprehensive examination of each other's accreditation systems and standards, the signatories agreed to recognise that their engineering degree qualifications are of equivalent standards. Signatories include the USA, Australia, Canada, Hong Kong-China, New Zealand, United Kingdom, Ireland and South Africa. Present observers are Japan, Malaysia, India, the Philippines and Papua New Guinea.

International Recognition of PNG Engineering Qualifications

In Papua New Guinea, the Institution of Engineers is the professional body responsible for ensuring accreditation and quality assurance of engineering education and practice. It has initiated a joint accreditation project with the Institution of Engineers, Australia, and the University of Technology on engineering degree programmes delivered by the University.

The Accreditation Project is organised in three stages, which involves IEPNG, Unitech and an international visiting panel from signatories of the Washington Accord, namely the engineering institutions of Australia, New Zealand and Canada. The IEPNG is responsible for arranging accreditation visits, which are in three stages as follows:

- Stage 1: Preliminary accreditation visit.
- Stage 2: Accreditation benchmark visit.
- Stage 3: Full accreditation visit.

The preliminary visit to Unitech is complete. The preliminary visit team subsequently submitted an assessment report to the IEPNG and Unitech highlighting recommendations and outcomes as post-visit activities. It is intended that Stage 2 will take place in 2002. Progress to Stage 3 and application to join the Washington Accord will take place on the basis of the outcomes and implementations of the Stage 2 visit.

International Recognition of Overseas Qualifications in PNG

The Engineering Registration Board of Papua New Guinea is responsible to the Department of Foreign Affairs for the assessment of qualifications of professional engineers from overseas who apply for work permits. In assessing such qualifications, the Institution of Engineers (as agents of the Board) accept qualifications recognised under the Washington Accord, subject to normal formalities. A selection of other qualifications is also accepted on the basis of past assessments and their international standing.

Where overseas qualifications need special assessment, a request is made to the Institution of Engineers (Australia) for their advice. However, at present, the IEPNG is developing its own guidelines on the basis of experience gained over the past few years.

CONCLUSIONS

The need to satisfy criteria relating to training, specialisation and professional participation as elements of the Graduate Professional Development Programme (GPDP) is necessary for those engineers who can satisfactorily serve the future development of Papua New Guinea. Active participation of senior professional engineers from outside the graduate's place of employment, if necessary, will enhance the quality of GPDP training.

In order to continue practicing as a Registered Engineer, professional engineers should be required to submit periodic evidence of having satisfied the CPD requirements of the Institution. Applicants for admission to corporate membership from overseas, in addition to satisfactory professional qualifications, should be required to include evidence of having satisfied the CPD requirements within the past five years.

The IEPNG, in collaboration with Unitech, should progress with the accreditation of engineering degree programmes and hence for recognition under the Washington Accord.

REFERENCES

- 1 Papua New Guinea University of Technology (Unitech), *Courses Handbook*. Lae: Unitech (2001).
- 2 Institution of Engineers of Papua New Guinea (IEPNG), *Regulations Governing the Election to the Class of Member for Graduates from the University of Technology or other Equivalent Qualifications*. Lae: IEPNG (2001).