

The Royal Academy of Engineering UK has agreed to extend financial support to a Project submitted by the Institution of Engineers Mauritius for financing under the GCRF Africa Catalyst Programme
“Engineering Capacity Building through Accreditation of Engineering Education”

Introductory Comment:

Is the Mauritian society aware that outside Mauritius, especially in the industrialised and emerging economies, Universities and other institutions which offer engineering degrees for professional engineering practice have made great efforts at delivering programmes of studies which conform to a global standard known as Washington Accord, while within Europe similar efforts are undertaken by Universities to ensure that the degree programmes conform to the standard set by the European Network for Accreditation of Engineering Education (the ENAEE)?

The process to which programmes are subjected for that purpose is called accreditation. This responsibility is assumed by the profession, and not by the authorities, notwithstanding the fact that Higher Education Authorities have a statutory obligation to ensure that the Tertiary Educational Institutions comply with certain legal requirements prior to being authorised to offer their programmes. The Authorities call this "accreditation" but this accreditation, to an unspecified standard, is far from the process that professional engineering institutions put in place for ensuring that programmes so accredited receive international recognition. While other institutions or authorities may choose not to make a difference between accreditation, validation and recognition, the engineering profession utilises the term accreditation to mean an approved process through which an engineering programme offered by an institution legally authorised to award a degree, viz. a University, is subjected to an evaluation for conformity to a set standard by an autonomous non-governmental body.

[The Royal Academy of Engineering \(RAEng\)](#) has approved the funding of a Pilot Project submitted by Institution of Engineers Mauritius (IEM) under the GCRF Africa Catalyst Scheme.

The project which is aimed at **Building Engineering capacity through Accreditation of Engineering Education** was launched on 14th September 2016 during a **Conference of the Council of Academies of Engineering and Technological Sciences (CAETS)** inaugurated by H.E Mrs Ameenah Gurib-Fakim the President of the Republic of Mauritius. Two Past Presidents of the IEM (Mr Jayesh Desai and Jagadish Soobarah) also attended the Conference at the invitation of RAEng.

The [GCRF \(Global Challenges Research Fund\)](#) is a £1.5 billion (Rs67 billion) fund announced by the UK Government to support cutting-edge research that addresses the challenges faced by developing countries. It is administered through delivery partners including the **Research Councils** of the UK and national academies, including the **Royal Academy of Engineering**. The Scheme proposed to consider some 15 projects from 49 Sub-Saharan countries for financing each to a limit of £40,000.



The **Royal Academy of Engineering (the RAEng)** was founded in 1976. Its aim is the “pursuit, encouragement, and maintenance of excellence in the whole field of engineering to useful purpose in order to promote the advancement of the science, art and practice of engineering for the benefit of the public”. Under its Royal Charter, the RAEng has power “to promote

excellence in the education, training, and experience of those engaged in engineering, or related

disciplines, and to stimulate excellence and encourage creativity and innovation in engineering and in research, development and design in the manufacture of engineering products and in engineering services”.

The objective of the GCRF Africa Catalyst Scheme is to assist **Sub-Saharan Professional Engineering Institutions** towards *ensuring there is sufficient, and appropriately skilled, local engineering capacity to participate in and drive national and regional development in sub-Saharan Africa”*. More specifically, the **GCRF Africa Catalyst Scheme** will focus on *“better connecting Professional Engineering Institutes (PEIs), Engineering Councils/Associations and other organisations working to strengthen engineering capacity, to the engineering research, policy, and business communities”*. To achieve its aim the **GCRF Africa Catalyst** *“will supports organisations which take a leadership role by working to ensure appropriate accreditation, professionalism, and opportunities for engineers nationally and regionally.”*

IEM has seen this as a unique opportunity to set the foundation for accreditation of engineering

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degree programmes in Mauritius in line with international practices. The IEM Executive Council appointed a **Working Group on Engineering Accreditation** which worked overnight to submit an application before the deadline set for 9th November. Since IEM had to enlist the collaboration of a UK Partner for delivery of its project, it chose a well-known organisation with a wide foot print in Africa: [Engineers Against Poverty \(EAP\)](#) for the purpose. EAP will bring in the collaboration of experts with wide

experience with the Commonwealth Engineering Council and the Engineering Council UK.

IEM proposes, through this project, to create a core group of engineers as well as academics who will be knowledgeable about engineering accreditation and who can subsequently assist IEM towards setting up, operating and sustaining an eventual institutional regime for accreditation of engineering education in Mauritius. Such a capacity is necessary if IEM is to put an application for membership of the Washington Accord, which it intends to do through an autonomous Engineering Accreditation Council to be established. This project will require the full collaboration of all Professional Engineering Bodies, the Faculties of Engineering of the Universities established in Mauritius, the authorities concerned with formulation and implementation of policies and delivery of engineering programmes, intended for professional engineering practice, as well as employers and regulatory bodies.

Why Washington Accord.

First Reason: The [Washington Accord](#) represents an academic standard which is **globally recognised as the academic standard to be set for graduates in engineering engaging in professional engineering practice**. It was established in 1989 by the professional engineering bodies of the UK, Ireland, Canada, USA, Australia, and New Zealand in the search for a consensus on the academic standard of an engineering degree that could be acceptable for engaging in engineering practice at professional level. That need was perhaps felt given an anticipated influx of job-seekers in the aftermath of collapse of trade barriers following on the WTO and GATS (General Agreement on Trade and Services) agreements. However, that standard has been there for 25 years now, and is accepted world-wide as the standard to set for graduates in engineering.

The Washington Accord standard represents an aggregate of Knowledge and Understanding of mathematics, science, and engineering principles, and skills and abilities, including transferable skills

that a person completing an accredited degree programme (of 4 academic year or equivalent) **must possess, and be capable of demonstrating, on graduation**. The emphasis of the standard is on **what graduates have learnt** and not **what they have been taught**. The only alternative to Washington Accord standard is that developed by the [European Network for the Accreditation of Engineering Education \(ENAE\)](#), leading to the award of the **European Accredited Engineer (ACE) label: EUR-ACE (Master)**, equivalent to **Washington Accord**, for degree programmes of the integrated **First and Second Cycle**, and **EUR-ACE (Bachelor) for First Cycle** programme. The **EUR-ACE** accreditation services are unfortunately not available to our Region.

To date, Washington Accord has been joined by 12 other Countries, the last to join was China, through the China Association of Science and Technology (CAST) earlier this year (2016), while Sri Lanka and India were admitted in 2014. Other full members (Signatories) are: Republic of SA, Singapore, Malaysia, Russia, Hong-Kong, China(Taipei), Japan, Korea, and Turkey.

Second Reason: The second and more compelling reason is that any engineering degree programme that would be accredited by any Mauritian agency admitted as a Signatory (full member) of the Washington Accord, **would be recognized by every other member of the Accord**, thus bringing **international recognition to the engineering programme so accredited**. It can be appreciated that international recognition would be at the door-step of Mauritius even if no other programmes of the same University or any other would have been accredited.

Why IEM

To appreciate this point, one should know that the Washington Accord standard goes beyond the graduates' attributes. There are certain rules which govern the structure of its eventual members, and concern their own operations. The accreditation agency must:

- (a) be **autonomous** from **Government and Higher Educational Authorities**, and autonomous **in its decision-making responsibilities**.
- (b) have **authority for the accreditation process**, that is, for setting academic standard of engineering degree programmes and the accreditation criteria.
- (c) be **representative of the engineering profession and be recognized** as such, and **accreditation of engineering degree programmes should constitute its core activities**.

The above criteria, especially the requirement of "autonomy" leaves us with very few choices. Most of the Washington Accord members are either professional engineering institutions and societies or corporate bodies established by the professional bodies themselves. Where any Government body has been admitted, the accreditation body has had to be autonomous. Of interest is the [National Board of Accreditation \(India\)](#) (established 1994, under the [All India Council for Technical Education Act \(AICTE\)](#)). It applied for Provisional Membership of the Washington Accord in 2007, but had to make changes to its governance structure. It became **autonomous in January 2010** and in April 2013 the Memorandum of Association and Rules of NBA were amended to make the NBA **completely independent** of AICTE, administratively as well as financially. It achieved full membership in 2014 after 7 years as provisional Member. Even then Washington Accord recognises only the degree programmes of TIER-1 Institutions that is those which are autonomous. Government controlled Universities are excluded.

IEM's attributes: IEM is the ideal candidate for Washington Accord, but it must establish an Engineering Accreditation Council. It is open to all branches of engineering and has remained so since it was founded in 1948 with Raymond Berenger, the Chief Engineer of the Public Works Department as its first President. It was IEM's efforts under Roland Desmarais that brought about the Ordinance

49 of 1965, which subsequently became the Registered Professional Engineers Act (1967); this Act regulates the practice of engineering in Mauritius. It was also an IEM initiative, under Raj H Prayag in 1988, with the blessing of the PM Anerood Jugnauth that the engineers got their Engineers' day (13th September), and they have ever since been celebrating Engineers day on 13th September each year. The IEM has been discharging its professional role within the Council of Registered Professional Engineers as well as at the level of several Boards, including the MSB, CEB, and the CIDB.

IEM's present initiatives must be regarded as its Plan-B to establish engineering accreditation in Mauritius. Its previous efforts had failed. IEM recalls that its representatives had contributed to developing a **Standard of Professional Engineering Competence** as well as a set of **Assessment Procedures** shortly after the UK promulgated its revised standard the UKSPEC in 2003. These were adapted from UKSPEC (2003). IEM had also contributed to developing amendments to the CRPE Act, including a draft Engineering Council Bill (in 2007) which would have replaced the current legislation. IEM has had to recognize that the draft of 2007, after successive versions became an unrecognizable document in 2016. IEM has advised that it be shelved.

Where does the [Council of Registered Professional Engineers of Mauritius \(CRPE\)](#) fit in?

No change is intended nor proposed. CRPE has a statutory role and responsibility to recognize and approve qualifications of applicants desiring to enter in the practice of engineering. That role it should continue to discharge. It has already in 2010 issued a press notice wherein it says it recognized qualifications accredited by Washington Accord organisations as well as those certified by the ENAEE. Therefore, any day (say in perhaps 4 to 5 years) when IEM secures signatory status of Washington Accord, any degree in engineering it accredits (to Washington Accord standard) should stand automatically recognized by CRPE. IEM believes CRPE can take steps as Singapore and Malaysia have done. Amend Section 13 of the CRPE Act to provide, in the law, for the registrable degree to be of 4year full time duration or equivalent, and to be accredited in accordance with the Standards and procedures of Washington Accord, or a body approved by the Council. It may also, if it wishes to be in line with international practices, make provision for registration of Technologists on the basis of Sydney Accord standard.

[What about the Tertiary Education Commission \(TEC\)?](#)

No issue foreseen, since TEC like any other authority in Mauritius should be only too glad that by IEM's initiative there is hope of international recognition coming to Mauritian engineering education. Issues, if any, can arise only from a narrow interpretation of the amendment done to TEC Act in 2005 when the definition of accreditation, which previously concerned only the establishments, was extended to programme of studies. IEM's view is that the amendment rightly empowered TEC to ensure that when licensing a tertiary educational institution, it should also apply some criteria to accredit the programmes in its own way. That is its duty and responsibility towards students, their parents and to society. Those amendments have not taken away the autonomy of the Universities to seek accreditation from any organization which can offer services to a standard of interest to them; neither do the amendments prevent any organisation from seeking membership of the Washington Accord and get "qualified" as a competent body to offer accreditation services; and again the amendments have not taken away the legal prerogative of CRPE to do what it must do to recognize any degree or other qualification in engineering.

As regards accreditation of engineering education, the Washington Accord process steps in only when an institution has passed out at least two batches of graduates, and will only accredit programmes delivered by an establishment duly licensed by Government authority, which is the TEC. Washington Accord accreditation is purely voluntary and will not be imposed. So how can there be an issue between TEC, IEM or even CRPE in matters of accreditation of engineering programmes?

Compiled by the Working Group on Engineering Accreditation
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