The Engineering Council 2002 to 2010

A Review by Andrew Ramsay MA CEng FCIS

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Foreword

This review of the progress of the Engineering Council offers an inevitably personal view of issues, events and people who contributed to what must be judged as a successful period. However, while the Engineering Council is never itself going to *be* the UK engineering profession, it certainly moved towards a more central and less controversial position in its work and profile during this time.

I am indebted to the detailed and lucid account of the earlier years of the Engineering Council written by Colin Chapman and Professor Jack Levy. Entitled *Chronicle: An Engine for Change,* this was published by the Engineering Council in 2004 and at the time of writing is still available on their website (shortcut link http://bit.ly/IY4ZLf).

However, for the shorter timeframe of this review I have adopted a less episodic structure than that of the *Chronicle*. It seemed to me that the extraordinary events that led up to creation of a "new regulatory body" in 2002, and in the 21 months that followed, deserved particular examination. Similarly, the way in which the Council was able to influence important developments in international recognition of UK-registered engineers can only really be understood in a continuous narrative – hence a separate section for this.

UK-SPEC was the crowning achievement of the period, but the extent of that achievement can only really be seen in the context of the standard for registration that preceded it. For that reason an Annex describes how SARTOR first gained and later started to lose the support of the profession.

Very many people contributed to the successes of the Engineering Council during the time covered by this review. Only a few are specifically mentioned, but little would have been achieved without the hard work of the members of the Board and its committees, enthusiastic members and staff of professional engineering institutions, and of course the tireless and dedicated staff of the Council itself. It should also be recognised that the foundations established by their predecessors in the "original" Engineering Council made a good basis on which to build.

I hope that this is just the beginning, and the UK engineering profession will continue to build its standing and influence, making use of the ideas and achievements of this relatively short period.

Andrew Ramsay

May 2012

A word on terminology

All active institutions develop acronyms and special meanings of words and phrases – the Engineering Council was no different. Some of these changed in the eight years covered by this review. The principal changes were:

1. The Engineering Council was created by charter in 1981. In this review it is called "the former Engineering Council " in the period 1981 to 2001; Engineering Council UK (or EC^{UK}) in the period 2002 to 2007, and the Engineering Council for the final three years.

2. The UK engineering profession has been served at any time by at least 100 engineering institutions, societies and associations with independent existence. Those that held licences administered by the Engineering Council are called professional engineering institutions (PEIs) as a shorthand description. Unfortunately PEI was also used as a term to describe regional associations of professional engineering institutions in a period of experimentation with these in 1996/97 (See the *Chronicle* pp 119, 120). This definition is no longer in use.

3. The largest PEI in 2002 was the Institution of Electrical Engineers, also known as the IEE. In March 2006 it became the Institution of Engineering and Technology (IET).

Engineers and technicians, who are assessed under licences granted by the Engineering Council and EC^{UK} and found to meet Engineering Council/EC^{UK} standards, can be registered by the Engineering Council (subject to payment of a fee and other requirements relating to conduct). The collective term for those registered is "registrants". At the beginning of this period the three categories were Chartered Engineer (CEng); Incorporated Engineer (IEng) and Engineering Technician (EngTech). In 2008 a fourth category, ICT Technician (ICTTech) was added.

Prologue

Dr Robert Hawley and the reformation of the Engineering Council

Robert Hawley had an inauspicious start to his career. His father, a qualified craftsman, had been unable to return to his job after war service and became a bus conductor. Robert was a talented lad, however, and managed to get a place at his local grammar school. He struggled however with undiagnosed myopia, and left at 16 with a poor academic record.

At this point his luck improved. Taken on as an apprentice by BICC, he worked his way through ONC and HNC – showing such talent that he was encouraged to apply to Kings College Durham University (later to become Newcastle University) to read engineering. Standards were such that, despite his top maths scores, he was nevertheless required to study for a further year before admission to the undergraduate course.

During his time at Durham he was sponsored by CA Parsons, and worked in their research labs. It was natural therefore to continue into a PhD – which led to an international profile as an expert on dielectric materials and their behaviour. The performance of dielectrics was vital to the development and reliability of the large generators being ordered by a rapidly growing Central Electricity Generating Board. Hawley became Head of Research at Parsons' International Research and Development centre (IRD) and subsequently Chief Electrical Engineer at Parsons. His introduction to the rough and tumble of 60s industrial relations came when he asked who was responsible for negotiating with the unions – and was told that he was! Success at Parsons led to directorships at NEI Parsons and Rolls Royce and subsequent responsibility for Nuclear Electric. His understanding of the industry gave him the opportunity to manage the privatisation of the Magnox stations in the British Energy portfolio.

Recognised as a successful businessman he became Chairman of Taylor Woodrow and an Advisory Director for HSBC.

Robert Hawley's academic and business success drew many honours and opportunities to serve his chosen profession. Not least among these was his Presidency of the Institution of Electrical Engineers in 1996. Hence it was natural for the Department of Trade and Industry (DTI) to suggest to the Engineering Council that he would make a good successor to Alan Rudge on the latter's retirement from the Chair in 1999.

Robert Hawley found an organisation that had lost its way. Far from offering leadership to the profession and advice to the country, it had become prey to internecine warfare between the powerful professional engineering institutions (PEIs).

Determined to act, he persuaded an initially reluctant Lord (David) Sainsbury – Labour's long-serving Minister for Industry - to fund a study to determine how this might be addressed. The consequent "Hawley Group" reports proposed a promotional body shorn of its regulatory role and organised to

campaign for and publicise the profession. This was an echo of the role originally proposed for the Engineering Council by Monty Finniston in 1980[1].

As the *Chronicle*[2] makes clear, the initial enthusiasm for the change was nearly punctured fatally by a challenge in October 2001 from the larger PEIs, whose support was vital (see box). This raised doubts at the DTI and elsewhere about the viability of the proposals. Robert Hawley recovered the situation by addressing their main concern – the need to maintain a regulatory body for the profession – splitting it off from the promotional activity, and capitalising on PEI fears that it would continue to be too bureaucratic by effectively capping its budget and handing the keys to the PEIs themselves.

> Discussions during 2001 had made it clear that there was more agreement on what the "new regulatory body" would not do, than on what it would. A letter from the "Big 4" professional engineering institutions stated "we do not believe that the Engineering Council, as currently structured, is capable of delivering the leadership role proposed" (30 November 2001).

While the PEIs took breath to consider this new situation Robert Hawley powered through his master plan, with a formal launch of the Engineering and Technology Board (ETB) in February 2001.

Unfortunately health problems, happily later overcome, meant that Robert Hawley handed over the ETB to a new team, led by the distinguished scientist Sir Peter Williams. It is clear that the new body struggled to find its feet. Bewitched at first by the potential of the newly unfolding internet, it failed to network adequately with industry, education and government as Robert Hawley had intended.

Meanwhile the "rump" – basically the former Board for Engineers' Regulation of the Engineering Council - morphed into EC[UK], and defied gloomy auguries by becoming a most effective organisation. However, it was not until 2006, with Sir Anthony Cleaver as Chair and Paul Jackson as CEO, that the ETB started to make a real impact. Tony Cleaver's "Big Bang Fair"[3] created the sort of headlines that Robert Hawley had envisaged for engineering careers, while new relationships with the Royal Academy of Engineering and the PEIs laid the foundation for profession-wide initiatives, like *Engineering the Future*[4].

[1] Hawley had known Sir Monty from his days as Director of CA Parsons' International Research and Development (IRD) research centre
[2] Page 163
[3] http://www.thebigbangfair.co.uk/home.cfm
[4] http://www.engineeringthefuture.co.uk/ See later

The Early days of EC[UK]

The rebirth of the Engineering Council as the Engineering and Technology Board and the Engineering Council (UK) was the culmination of a huge struggle to put engineering in its rightful place as a vital activity for a modern economy. During the '80s Britain was captivated by the stunning success of its financial industries. Many spoke of a "post-industrial" economy. By the late '90s this had resulted in a scramble to join the dotcom revolution. Enormous fortunes were being made from the promise of the internet – many to be lost in the subsequent shake-down as the bubble burst, of course.

It is tempting to rewrite the closing chapters of the *Chronicle*. Pages 155 to 180 detail the battles fought by Dr Robert Hawley to create a new initiative intended to give new status and momentum to engineering. However some of the themes that defined consequent developments can be recognised:

The opportunity: Hawley's vision of a body more representative of the 2 million involved in engineering[5] helped to engage the support of the "Big 4" professional engineering institutions, even as they argued for more control over the outcome.

The weakness: The weakness of the Engineering Council was partly a result of the failure of the ground-breaking regulation SARTOR 3[6] to be accepted by industry (particularly as represented by the Engineering Employers Federation and the Engineering and Marine Training Association) and byacademia (represented by the Engineering Professors' Council). This led to proposals that the new Engineering and Technology Board should take responsibility for reviewing professional standards in engineering, including those for continuing professional development[7].

Lack of faith in the Engineering Council was reflected in formal resolutions: "The ETB [not the Engineering Council] should act as the UK representative body in matters that relate to the international recognition of UK Registered Engineers and Technologists" (ETB Shadow Board statement 24 September 2001). "Registrants' fees should go not to the new regulatory body but to the ETB". The ETB would "take over from the Engineering Council its main promotional activities" (Senate Resolutions 3 October 2001).

The sense of millenarianism that prevailed at the time: This was not just the fact of a new millennium, but the realisation that so much of the modern world already depended on an ephemeral internet. Although the millennium bug[8] had not managed to close down civilisation despite widespread prediction that it would, it had emphasised the fragility of modern systems. There was also the global shock of 9/11 – which was still reverberating when the former Engineering Council's Senate met to agree its own fate on 3 October 2001, and as the Council's staff became

[5] From *the Universe of Engineering: a UK Perspective* - a report prepared by a joint Royal Academy of Engineering/Engineering Council Working Group, under the chairmanship of Sir Robert Malpas.
[6] *Standards and Routes to Registration 3*, published in September 1997.
[7] *Making the Best of Valuable Talent* published by the Hawley Group September 2001.
[8] The so-called millennium bug was a belief that software coded in the 70's and 80's using two-digit year signifiers was still in use in infrastructure and banking, and would cause these systems to collapse on 1 January 2000,

aware of the implications of Malcolm Shirley's ejection without ceremony from his Director-General role on 6 September. A willingness to accept change that previously had been unthinkable was apparent.

The opportunists in the professional bodies were conscious that the original Engineering Council had not conformed to the normal organisation of professions - being an essentially non-elected body, claiming to represent the engineering profession and holding its register of qualified members. They had been seared by the experience of the "Mark 2" version of the Engineering Council's constitution[9] which had actually been developed by Sir Alan Rudge with their active support. This had apparently given them the democracy they wanted (albeit "tainted" by the need to involve actual registrants) but had unwittingly created an unwieldy body that lost power to an effectively unelected executive. This time they had the opportunity to control the levers of regulation, while leaving the vague task of promoting engineering to a separate body.

The mechanism of their power – the newly-formed Engineering Council UK – carried with it a perhaps unforeseen need to demonstrate responsibility in wielding it. Previously the major engineering institutions had developed a knack of carping from the sidelines whenever the former Engineering Council failed to live up to their aspirations for it – hence the series of reviews and reforms set out in detail in the *Chronicle*. Arguably the success of the new body owed much to this new-found responsibility.

The weakness of the former Engineering Council gave immediate purpose to the new body's Board. It was no surprise that they set themselves the objective of creating a new and workable registration standard at their first meeting. The surprise was that it was agreed and published in just over a year, bearing in mind the six year gestation period for SARTOR 3 – which itself was basically a revision of the previous standard.

Millenarianism provided the sense that anything was possible. The new Engineering and Technology Board was riding high, while the Engineering Council was widely seen as a failed body. Since most of the former Engineering Council staff had been dismissed or found other jobs, the remainder held no great hopes for their own. Rather like Italy in the cuckoo clock speech in *The Third Man*[10] the Engineering Council UK found that it was suddenly able to create work of exceptional quality and impact at a time of great turmoil.

Five Months of Vacuum

The Senate of the Engineering Council agreed to wind itself up with a brief meeting on 6 December 2001, at which the draft petition to amend the constitution of the Engineering Council was adopted. The remaining work of the Senate was to bless the decisions of the Finance and Audit Committee, chaired by Neil Sturrock. These included the division of the remaining assets between the

[9] The Engineering Council's revised charter published in 1997, based on a jointly agreed document entitled *A longer lasting relationship*

[10] "…in Italy, for thirty years under the Borgias, they had warfare, terror, murder, bloodshed, but they produced Michaelangelo – Leonardo Da Vinci, and the Renaissance… In Switzerland, they had brotherly love. They had five hundred years of democracy and peace, and what did that produce?…The cuckoo clock."

Engineering and Technology Board and Engineering Council UK, with a proportion paid over to the Engineering Council Pension Scheme to eliminate its deficit.

Apart from a brief meeting of the Senate on 25 March 2002 to receive the revised Charter and Bylaws, sealed by HM the Queen just three days before, and until a "meeting of board members" [see below] late in the following May, Professor Patrick Dowling and Andrew Ramsay, respectively the Acting Chair and Acting Director General for the Engineering Council, were the sole source of authority for the organisation. There was much to do. Aside from the statutory requirements of publishing accounts and paying bills, there were a significant number of staff whose redundancy became necessary, and the revised charter itself had to be piloted into fruition. Meanwhile the enthusiasm and interest of the professional engineering institutions had to be maintained and fostered, and working arrangements established with the Engineering and Technology Board. The ETB's chairman, Sir Peter Williams, was in post by early 2002, but his CEO, Alan Clark, was not appointed until March.

Understandably, little policy work could be undertaken by either organisation, and staff morale took quite a knock. It was decided that a first meeting of PEI nominees for the Board of EC^{UK} should take place as soon as possible after the grant of the Charter, and use was made of the facility to hold a "meeting of board members". This turned out to be helpful, because the new ETB had only just decided who they would nominate as the 7 Board members in their gift, but because it allowed some of the pent-up frustration that the professional engineering institutions had built up to be released before the board got down to formal business.

Unfortunately, one of the casualties of this process was Professor Dowling himself. Having formed the view that they wished to distance themselves from the former Engineering Council as soon as possible, the PEIs decided that they would ask him to stand down immediately. The lack of ceremony in this act, with no acknowledgement of the substantial contribution Dowling had made to the creation of the new body, and his extensive commitment to maintaining the work of the Board for Engineers' Regulation, was sad, but perhaps reflected the febrile times[11]. There was some disagreement on the question of whether Andrew Ramsay should continue, and the meeting of 25 April asked him to formally apply for the position of Executive Director in May 2002. He was confirmed in this post at the first meeting of the Board on 30 May.

30 May 2002 - The First Meeting

The first meeting of the Board of EC^{UK} took place at 10 Maltravers Street. The 22 new Board Members came from a diversity of backgrounds. Industry was well represented, including the directors of three FTSE 250 companies. Two vice-chancellors and a serving Rear Admiral ensured academia and the armed forces participated, and at least three members had been nominated by PEIs primarily concerned with IEngs and EngTechs. The mix included 6 CEOs and deputy CEOs from major PEIs. During discussions establishing the constitution for the new body there had been considerable debate about the wisdom of allowing PEIs to nominate "paid staff". It is clear in retrospect that the decision to include staff turned out to be a sensible investment - ensuring the stability of EC^{UK}, and giving the Board access to experience accumulated by senior staff. The

[11] As surprising perhaps as the failure of the Institution of Structural Engineers, whose original nominee he was, to acknowledge his work. Prof Dowling was a Past President of the Institution.

membership also included two women – hardly remarkable in most contexts, but influential in a profession where still only 2.4% of registered professionals were female.

The meeting lost no time in confirming the election of Sir Colin Terry as its first Chair. Sir Colin had enjoyed a distinguished career in the Royal Air Force, serving as Air Officer Commanding-in-Chief at RAF Logistics Command in 1997 before retiring in 1999. The committee structure was agreed, the idea of Board member "alternates" dismissed, and Dr Trevor Evans tasked with proposing how the SARTOR regulations might be reviewed.

By the next meeting – in July – the Board had adopted a new logo (the blue double square proved to be very adaptable when reversion to the name "Engineering Council" occurred - see later) and the Board met head-on the issue of ensuring strong representation from the PEIs, by using Dr Evan's chairmanship of G15 (see box) to request immediate action on proposing members for the newly-formed committees.

The Big 4, G15, and the 26

Much of the early history of the Engineering Council was dominated by discussions with "the Big 4". Presidents and Chief Executives of the Institution of Mechanical Engineers (IMechE), the Institution of Electrical Engineers (IEE), the Institution of Civil Engineers (ICE), and the Institution of Chemical Engineers (IChemE) met regularly to share policy issues and compare views. Frequently the result was a letter or visit to the Engineering Council, sometimes correspondence in the national press or with Government ministers. The Big 4, as these four PEIs were popularly known, were better resourced than the other professional engineering institutions. Between them they could claim to represent nearly 70% of all registered engineers. Although the IChemE was perhaps fifth or sixth amongst the engineering institutions in terms of total membership (being overtaken by the IStructE and the British Computing Society during the 1990s), they retained influence through their substantial support from the oil and chemical process industries, but also because of their experienced and articulate CEO, Dr Trevor Evans. During the mid 1990's the IEE and ICE introduced the idea of a larger grouping of CEOs, to include more of the "newer" PEIs. The G12, at that time chaired by Andrew Ramsay as CEO of the Chartered Institution of Building Services Engineers, influenced the Rudge proposals. It was later reconstituted as the G10 in 1999 to discuss and influence the Hawley Group – and especially the shape of the proposed "new regulatory body". Evans chaired the G10, and this subsequently became the G15 as more PEIs were admitted, with Keith Read as chairman. With the active encouragement of Read, and EC^{UK}, the remainder of the licensed PEIs were banded together as G26, so their views could also be shared and discussed.

A discussion on ethics led to the conclusion that this was not a matter the Board should concern itself with at the time. However, concerns about something called the Bologna Declaration ignited debate and led to a call to make representations to the Higher Education Minister. (See the chapter on International Recognition).

Unfortunately the fiscal relationships between EC^{UK} and the ETB had been left somewhat tangled. While ETB appeared to have the final say on EC^{UK}'s budget, EC^{UK}'s constitution seemed clear that the budget would be decided by the EC^{UK} Board. Since both organisations were, at least initially, heavily dependent on the fees paid by registrants (which were themselves set by ETB), the scope for conflict was considerable.

John Baxter was the first chair of the Finance, Audit and Remuneration Panel. Examination of Baxter's budget proposals established a basis for demarcation with the ETB, including a decision that EC[UK] should have its own finance officer. In the event, Sir Colin later met with Sir Peter Williams of ETB and agreed informally that EC[UK]'s interpretation would prevail, within certain parameters.

A new basis for Registration

On 25 September, the Board held its first Retreat – at the Royal Aeronautical Society. The priorities that emerged were the need to review the whole basis for registration of professional engineers in the UK, and a wish to clarify the value added by registration

The Board agreed that these issues must be addressed from the standpoints of:

- maximising communication of intentions and outcomes
- addressing the needs of the whole profession
- ensuring relevance to international developments

Professor Kel Fidler was asked to make a presentation on SARTOR and as a result a Review Task Group consisting of 5 Board members and two staff was set up, chaired by Professor Fidler. The Board was clear from the start that the Review should be completed in the minimum time compatible with gaining widespread engagement and support for the outcomes. A target of autumn 2003 for publication of the new documentation was envisaged, based on adoption of a Specification by June.

Professor Fidler had been nominated by the IEE, but was essentially his own man. A Vice-Chancellor of a large and successful post-92 university, he also had extensive experience in chairing the IEE Accreditation Committee and participating in degree accreditation panels, as well as lead assessor experience in industrial quality assurance. His task group included Dr Trevor Evans, who had been Chief Executive of IChemE since 1982, and a vociferous critic of the Engineering Council both inside and outside of the Big 4.

The other members were:

- Amar Bhogal, Deputy Director-General of the Institution of Civil Engineers - an Institution that was still struggling with the aftermath of bitter infighting that had included Presidents and senior staff. There were many calls from ICE to water down the requirements of SARTOR, which had been seen as overly academic to an industry which increasingly valued managerial expertise over scientific endeavour.
- Professor Graham Davies was Head of the Engineering School at Birmingham University, but also had strong links with industry, being General Manager of Technology Acquisition at British Telecom.
- Barry Dobson, was a nominee of the Institution of Incorporated Engineers (IIE). Dobson had been a Head of Department at a Further Education College, but as an officer of the IIE had been intimately involved in the development of that Institution. It had only recently gained its charter, and was keen to raise the profile and the appreciation of the role of Incorporated Engineers and Engineering Technicians. Although part of the Engineering Council Register from the beginning, they had been largely overshadowed by the relative glamour and standing of chartered engineers, something Dobson was determined to change.
- ECUK's CEO and Deputy CEO Andrew Ramsay and Richard Shearman made up the balance.

There was an undoubted wish of the profession to address the perceived problems of SARTOR 3 [see Annex B]. Principal amongst these resulted from the requirement for accredited courses leading to CEng to admit no more than 20% of their cohort with A Levels lower than two grade B's (or equivalent) – known as the entry standard requirement. This requirement had been carefully drafted in the belief that engineering departments were increasingly accepting poorly qualified students in a desperate attempt to maintain numbers in the face of a reducing appetite for engineering as a career. The 20% was an attempt to acknowledge that, for a variety of reasons, A level achievements were not necessarily always indicative of the potential of students – particularly those who came from schools where there was difficulty in providing teaching to the level demanded.

Dissatisfaction with SARTOR also turned on the complexity of its regulations. A fat ring binder, supplemented with a number of Guidance Notes, was not always enough to enable a clear decision on the capability of an applicant to satisfy requirements. The specialist language (Matching Sections; Section 9 approval, etc) led to the feeling that a specialist priesthood had grown up to interpret the documents.

Resistant to the idea of an outside body dictating who universities might or might not accept onto their courses, the Engineering Professors' Council had decided in 1999 to approach the allegations of falling standards from another angle. They also were aware of suggestions by industrialists that graduates were ill-prepared for engineering practice, but decided to meet these criticisms head on. A working group was set up and a list of graduate attributes ("abilities to.."[12]) were drawn up and brokered with industry[13]. These demonstrated that employers were interested only in the capabilities of their staff, and not in how they had been educated or trained.

From the point of view of the ECUK's new Working Group this was an unmistakable signal to drop the idea of entry standards and concentrate on what registered professional engineers should be able to do. This had the benefit of reinforcing the value of registration, because it demonstrated that a professional engineer was more than just a sum of his or her education, training and experience. Registration was a test of total capability – in other words, competence. The idea was not particularly new, however. The former Engineering Council had been deeply involved in the so called Standards Movement – the move to adopt the proposals of the National Council for Vocational Qualifications (see Annex B). One result had been that SARTOR 3 included statements of the competences expected of chartered engineers, incorporated engineers and engineering technicians. However these were expressed as if they were the expected result of the routes taken and experiences gained, rather than the true test of ability to practise engineering as a professional.

The Working Group decided that they needed to consult widely. The slender resources of EC[UK] were thrown into developing a major seminar in December 2002 to discuss the issues and hear from employers, educators and trainers, the professional engineering institutions and from registrants themselves.

Chaired by EC[UK] Chair, Sir Colin Terry, the seminar opened with a plenary, followed by a series of breakout sessions, each succeeded by an "ideas market" providing opportunities to paste up suggestions arising. Over 200 delegates attended the full day seminar, including many who had been critical of SARTOR. The Institution of Civil Engineers hosted the event, and a team of professional facilitators were engaged.

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[12] See http://www.epc.ac.uk/uploads/output_standards/The%20EPC%20Engineering%20Graduate%20Output%20Standard.doc

[13] http://www.epc.ac.uk/uploads/output_standards/epc_egos_ewg_200202.pdf

The eight breakout sessions enabled discussion of such matters as: Did requirements vary from sector to sector or between companies? What could engineering education be reasonably expected to deliver? Was it possible to align engineering technician criteria with programmes such as Advanced Modern Apprenticeships? Did the current registration categories and their descriptors match the reality of the workplace? At the end an "open discussion", with Prof Kel Fidler and Dr Trevor Evans on the stage, enabled the key issues to be teased out.

The result was very fruitful. Having peered over the edge of the abyss, those attending decided that it was useful to have standard criteria for categorising and recognising professional engineers, and that the current education and training system was capable of delivering them. In particular, the seminar and subsequent correspondence clarified that:

- demonstration of competence was a core requirement
- the competence statements in SARTOR 3 could form the *basis* for future registration
- the MEng degree should continue – as the 'high status' route
- clear and simplified progressive 'top-ups' to enable progression between levels must be established
- the Engineering Technician standard should reflect developments in Modern Apprenticeships.

However, there remained uncertainty about Incorporated Engineers. This distilled into a concern that Higher National qualifications had been sidelined (SARTOR 3 had decreed that they would need to be upgraded to BEng level), despite their popularity with employers, and disagreement on whether IEng should be a chartered grade. [See also Annex C: Incorporated Engineer title].

Nevertheless, the Working Group now had the basis for rapidly developing the new standard. Ramsay and Shearman were determined that it should be as accessible as possible, and also that the part concerning Engineering Technician registration should stand alone in order to get away from the impression that the engineering technician was "chartered engineer lite". Conscious that a major concern lay in how to differentiate the Incorporated Engineer's role from that of the Chartered Engineer, they made the differences into a table at the heart of the CEng/IEng document.

The Engineering Professors' Council (EPC) and others were astonished at the speed with which the new draft took shape. The President of the EPC, Professor Bill Banks, wrote in early January 2003, in response to an early consultation document "It seems to me that a complete rewrite in the timescales considered is going to be less helpful than continuing with the current SARTOR. We simply must get it right and listen to what the community are saying." However, by 23 April he was able to write on behalf of the EPC that "We broadly welcome the proposals".

The January EC^{UK} Board gave authority for the draft standard to be circulated to the engineering community in late February. Among others it was circulated to:

- Sector Skills Councils
- National Training Organisations
- Major relevant employers' organisations
- All relevant FTSE Top 100 companies
- Over 100 other named industry contacts
- University Vice-Chancellors
- Deans/Heads of university engineering faculties and departments
- Representative bodies for further and higher education in engineering
- Funding bodies for further and higher education and training

- Regulatory bodies for educational and vocational qualifications.
- The Learning and Teaching Support Network Centre for Engineering, at Loughborough University (who publicised the draft standard to engineering higher education staff through their electronic bulletin and website).

In addition to this, the standards had been publicised in a press release and placed on the EC[UK] website. Over 10,000 copies of the drafts were downloaded[14], and the 147 formal responses, many collated from sectoral bodies by related PEIs, were discussed at a Working Group meeting on 7 May.

The main work of the summer was developing and reforming the draft standard, including parallel work on design of the publications themselves, and on the important issue of the relationship between EC[UK] and its Licensed Members. The focus was on ensuring that the standard would be understood by employers and valuable to Institution members who sought to be measured against it. An early decision was to call it the UK Standard for Professional Engineering Competence, thus emphasising the test at its heart. The acronym UK-SPEC was adopted.

Marketing the Standard

Following discussions between Sir Colin and Sir Peter, ETB adopted a marketing programme which specifically provided for promotion of registration and membership. Early discussions with key members of the ETB Communications team enabled resources to be allocated for a campaign starting with a "tickler" in November institution journals, followed by a full scale launch in early December with follow ups during the New Year. The Standard was launched by Lord Sainsbury[15] and Prof Fidler at the Central Hall Westminster on 1 December 2003 to an audience of 250, including journalists and prominent engineers. The launch was judged a great success, though it was nearly ruined by the combination of a postal strike and by the failure of the courier to deliver copies of the new standard to the right address.

The launch enabled energetic efforts to get the new standard read, discussed and applied. Presentations were made to meetings of engineering academics; industry, including the EEF Education and Skills Committee; Directors of Rolls Royce, and the Chief Naval Officer's Conference. The new communications medium for EC[UK], Register News, and the special UK-SPEC Website formed an important part of the promotion – the latter showing 6000 downloads of UK-SPEC by the first week of January. A programme of seminars for PEI membership staff took place in February.

[14] Quite impressive – these were still early days for the internet

[15] Lord Sainsbury of Turville, Parliamentary Undersecretary of State and Minister for Science and Innovation

Year by Year

2002

EC^{UK}'s first Chair

Sir Colin Terry KBE, CB was a leading member of the Royal Aeronautical Society. He had spent 40 years in the RAF, rising to the rank of Air Marshal and Chief Engineer for the Force. He proved to be an ideal first chairman, immediately gaining the confidence of the Board, while, since his Institution was not one of the Big 4 PEIs, being seen as a neutral figure amongst PEI leaders. His initial instinct was to address what were seen as the principal weaknesses of the former Engineering Council – an antagonistic approach to quality assurance of PEI licences; and general antipathy to SARTOR 3. Both these issues were successfully taken care of, and he turned his later energies to promotion of registration to major employers.

A prospectus for EC^{UK}, largely drafted by Andrew Ramsay, was used as the basis for determining the procedures and committees of the new body. Despite initial reluctance on the part of the new Board to delegate, as confidence grew in their colleagues more of the detailed policymaking was assigned to the committees. Initially these were the Registration Standards Committee; the Quality Assurance Committee; the International Advisory Panel; and the Finance, Audit and Remuneration Panel.

The Board agreed a variation on the normal rules of trusteeship. Aware that many of the former Engineering Council's problems had arisen because the PEIs believed their nominees had "gone native", it was agreed that nominee trustees should take responsibility for speaking and voting in line with their own PEI's views. Although technically an infringement of the requirement only to act in the interests of EC^{UK} as a charity, it was recognised that the longer term interests of the profession lay in the accommodation of PEI views and interests. This proved to be the case.

The Board swiftly adopted a new logo and house style created by their newly-appointed communications consultant, Ed Hallatt. The two blue diagonally adjoining squares, consciously embracing the "UK" as a superscript, proved a fortuitous choice when the name changed again in 2009.

Responding to a widespread belief that the former Engineering Council had been profligate in publishing material already available from the PEIs it licensed, it was decided that the only regular communication would be a low key periodical, "Register News". This was published only as a pdf and available, initially, only to those who really interested in the standards and processes of registration (a passing interest for most professional engineers). Launched in May 2002 to 400 staff and volunteers in the PEIs, demand for further subscriptions was immediate and so it was decided to make the publication automatically available to any registered engineer or technician who requested this. It rapidly grew in circulation, reaching 700 by the end of the year and the content had been expanded to cover news of relevant vacancies and of events planned by PEIs.

Chris Senior retired as the Engineering Council's manager of continuing professional development (CPD). Senior had been instrumental in developing the profession's policies on the need for CPD, and on approaches to identifying, encouraging and recording CPD. Engineering had been one of the

first professions to recognise the value of explicit CPD, and Senior's regular seminars and conferences had helped to make the profession CPD-active long before many other professions had understood its importance. However, by 2002 there was an awareness that the engineering profession was unwilling to go forward with compulsory or centrally recorded CPD – partly because each PEI needed to decide how valuable this would be and partly because of growing recognition that early recording systems had been bureaucratic, while lacking much rigour. The high tide mark was creation of a website "How2PD" supported by 7 leading PEIs, which provided guidance on good practice for CPD. As will be seen, further attempts were made to develop CPD practice in later years.

The roles of ETB and ECUK – the joint statement

ETB, a partnership to promote Science, Engineering and Technology, is dedicated to ensure that the supply of science, engineering and technology skills better matches and stimulates market need. To achieve this, it must engage with the science, engineering, and technology community and most importantly, business and industry. ETB works closely with the professional bodies in this community, which include the science and engineering institutions and the regulatory bodies including ECUK and the Science Council.

An important opportunity for the engineering profession lies in government's realisation that skilled professionals are the key to realising and enhancing the contribution SET makes to the community.

ECUK retains the obligation to maintain common standards across the engineering profession. To do this, it operates the register of Chartered Engineers, Incorporated Engineers and Engineering Technicians. Working closely with the engineering institutions, it ensures that the assessment of skills needed by professionally qualified engineers is conducted fairly and thoroughly.

ETB assists ECUK in defining future skills needs, aided by its special relationship with industry. In this regard, creation of new registers of technologists offers the opportunity to recognise new skill sets embracing emerging technologies. More importantly, this can also satisfy industry's need for commercially orientated individuals, comfortable with technology, but lacking detailed understanding of the underlying mathematical or scientific principles,

Registered engineers pay a modest annual renewal fee to retain their titles. For many years, a substantial proportion of this has contributed towards improvement of the understanding of the role of engineers and their contribution to society. ETB already has greater leverage on funding

Meanwhile, ETB took on the role of champion of CPD and Senior was not replaced. Inevitably some detailed negotiation of responsibilities between ETB and EC^{UK} took place. Tony Farrington transferred to ETB, together with his responsibilities for statistics-gathering and research. While finances were kept separate, EC^{UK}, with its need to keep registration data secure, and heavy committee load, provided IT infrastructure and house services to both organisations. A joint statement was issued, delineating the roles of the two organisations [see box]. Behind the scenes

EC[UK] Chair Sir Colin Terry and ETB's Sir Peter Williams agreed a formula to provide some stability to EC[UK]'s finances.

The undoubted influence of the engineering profession on national education policy faltered at this time. The former Engineering Council's General Education Committee had been disbanded – some PEIs believing that it had undermined their own efforts. However the new EC[UK] stretched resources in order to be able to support the Engineering Education Alliance – a pan-profession body initiated by Mark Whitby as President of the Institution of Civil Engineers in 2001/2. Ruth Wright, the EC[UK] education executive, was very much responsible for keeping the Alliance going, despite the fact that for many meetings it acted only as a channel for informing the few education executives in the PEIs of the changing school, college and university scene. (It later provided the core for *Education For Engineering*, a much more powerful body, led by the Royal Academy of Engineering and one of their several responses to the Select Committee Inquiry into engineers and engineering in 2008/9 – see page 27).

The Registration Standards Committee, chaired by the Institution of Electrical Engineers (IEE) nominee, Professor Kel Fidler, first met in October. It drew on a wide pool of PEI nominations, the Chair and Secretary (Richard Shearman) being careful to ensure balance and authority. A key innovation (reflecting the Board's own composition) was to allow experienced staff members to be full members of the Committee – the importance of peer governance of the profession being preserved by ensuring a majority of volunteer members.

The Registration Standards Committee's First Chairman

Professor Kel Fidler combined very effective management and leadership skills with a deep understanding of quality assurance matters as they applied to education and the professions. He had taken on the post of Vice Chancellor and Chief Executive of the University of Northumbria in 2001 and it grew in numbers and standing throughout his period of service at EC[UK]. While gaining a reputation as a world-acknowledged expert in electrical circuit and filter design he had been an academic at the Universities of Essex, York and at the Open University. He had also served as a qualified industrial lead assessor, and as chairman of the IEE's Accreditation Committee and panels.

A founder member of the EC[UK] Board, he became de facto chair of the UK-SPEC and Graduate Standards panels as well as chair of the newly-formed Registration Standards Committee.

In 2005 he was elected Chair of the Board in succession to Sir Colin Terry and served two terms, retiring in 2011.

The new Committee received a report of a survey of engineering deans, which confirmed that MEng degree provision was healthy, but the Bachelor of Engineering (BEng) was in decline. They also approved transfer of the administration of the Engineering Council Examination to City and Guilds – a10 year contract which enabled EC[UK] to transition out of an increasingly expensive activity. The Examination had established UK engineering standards in many developing countries, who as they

themselves industrialised, formed their own engineering registration authorities and developed their own university programmes.

The Registration Standards Committee (RSC) also received the results of a study by the Institution of Incorporated Engineers which indicated that many "Modern Apprenticeships" (later called Advanced Apprenticeships) could meet all of the criteria for Engineering Technician Registration. While assessing and advising on apprenticeships was a resource-intensive activity for the mostly small PEIs who would benefit, this enabled steady creation of a database of compliant apprenticeship programmes which would later provide the springboard for the technician initiatives of 2010-12.

Part of the legacy of SARTOR 3 had been the "matching section" – a requirement that those who had obtained a degree which had in some respects fallen short of the accredited MEng should demonstrate that they had made up this apparent academic deficit in order to be able to register as chartered engineers. A working group under the chairmanship of Dr Peter Melville from the Institute of Physics was able to adapt procedures developed by the Institute (whose members had largely undertaken physics degrees) to satisfy SARTOR requirements. The working group produced a template for the "technical report" which, in harnessing the knowledge and understanding of a candidate directly, did away with the cumbersome and unwelcome implication that only some form of additional (and sometimes irrelevant) formal college or university study would always be necessary to meet the standard.

RSC also at this time took advantage of the growing mutual understanding with the Engineering Professors' Council to initiate discussions with the Quality Assurance Agency for Higher Education to establish a relevant "benchmark" for engineering degrees. This led in due course to an increasingly valuable alignment between the engineering profession and the Agency in academic matters.

Terry Smith retired as manager of nomination and licensing at this time, to be succeeded by Dr Adrian Bodimeade, with the new title of Director of Quality Assurance. Smith had overseen a period where growing consistency and rigour of procedures had developed in PEI assessment of individuals for registration and in accrediting academic and training programmes. Almost inevitably this had led to occasional disputes and confrontations, but his legacy was secure.

Bodimeade had developed QA systems for major industrial clients and was able to provide the newly-formed Quality Assurance Committee – chaired by former Society of Operations Engineers Director Philip Corp – with a more intensive system of peer engagement. This involved successfully establishing volunteer liaison officers in all PEIs (able to sit in on all assessment activity), as well as workshops to share and cultivate good practice across the profession.

How influential?

In December 2002 the Economist newspaper published an analysis of the 100 most influential people in Britain. There, in the list, with such luminaries as Tony Blair, the Prime Minister, and Lord Woolf, the Lord Chief Justice, was Sir Colin Terry, listed correctly as Chairman of the Engineering Council. This was a surprise, but also a big boost to the morale of the staff and volunteers struggling to re-establish the role of the Council. For further detail see http://www.economist.com/node/1477687

2002 closed with 257,039 "final stage" registrants, 6586 of them female, and with EC[UK] employing just 20 full time staff (down from its 2001 total of 59).

2003

UK-SPEC was the major issue of 2003. The Registration Standards Committee had five working groups evolving policy and polishing texts. The Minister for Science, Lord Sainsbury, was very supportive, attending the Board's Awayday in September, and launching the completed standards on 1 December.

EC[UK] managed to gain some involvement with the Tomlinson Inquiry – a major attempt to show how A levels could be replaced with a baccalaureate-style qualification for 18-year-olds that could provide parity of esteem for vocational and academic study. EC[UK] was represented on some of the panels, and contributed supporting evidence to the Inquiry. The profession shared widespread disappointment in the education community when the government rejected the Inquiry's recommendations.

More promisingly EC[UK] was drawn into the creation of an Engineering Centre which was part of the newly established Learning and Teaching Support Network for Higher Education. This was one of several initiatives to professionalise teaching in HE. The Engineering Centre, based in Loughborough University, became one of the most successful Centres, managing to overcome inter-institutional snobbery to run many effective practice and insight-sharing initiatives. Richard Shearman, Deputy Director of EC[UK], chaired the steering committee for the Centre.

One of the many disappointments of SARTOR 3 had been the failure of the new standard to galvanise enthusiasm for the Incorporated Engineer grade of registration, despite its association with the 3-year bachelor degree, and apparently more practical and less theoretical emphasis. Initial interest in addressing this problem was strongly supported by the newly-formed Engineering and Technology Board (ETB).

As a result a working group was set up, chaired by the ETB's nominee Prof Sa'ad Medhat in April 2003. The panel researched demand for, and perceptions of a "new" title: technologist. Dr Medhat took advantage of his wider remit with ETB to widen the membership of the working group and its

terms of reference. It had been hoped that the Technologist Working Group would provide a basis for developing a new section of the Register, or adapting an existing section. Unfortunately no robust case was made. One reason was prior adoption of the title *chartered technologist* by the Institution of Marine Engineering, Science and Technology (IMarEST). They had previously obtained Privy Council approval for the title "Chartered Marine Technologist", an effort to broaden the appeal of the Institute to those working in the expanding marine technologies. IMarEST had set the academic level of their membership grade firmly at masters degree standard and they were understandably reluctant to agree to the creation of any similar title with lesser academic standing.

EC[UK] was able to demonstrate understanding of the significance of the Bologna Declaration[16], signed in 1999, and had gained considerable experience of its effects on European colleagues, during meetings in FEANI (see later section on International Recognition). This increased EC[UK]'s standing with PEIs and other bodies, including the Engineering Professors' Council and UniversitiesUK[17].

The Privy Council continued to seek EC[UK] opinions on changes to relevant charters and bylaws, as it had with the former Engineering Council. The frequency and variety of requests led to the creation of a Privy Council and Regulations Panel, which was chaired by Philip Corp. A major issue was a petition by the IEE for permission to create, through merger with other PEIs, an Institution of Engineering and Technology. In the event only the Institution of Incorporated Engineers joined with IEE, the Institution of Mechanical Engineers deciding to pull out of discussions late in the project. The new charter was granted in 2006.

EC[UK]'s Quality Assurance Committee persevered with efforts to draw in more volunteers from more PEIs in order to reduce the burden on experienced assessors, while widening understanding of its role. A concerted effort was made to reduce its paperwork requirement of PEIs.

2004

Following the universally positive response to UK-SPEC, attention turned to production of an Accreditation Handbook (to assist PEIs in accrediting engineering degree programmes), and some succinct[18] Regulations for Registration. These were published in May.

The Board of EC[UK] perceived a growing consensus that more needed to be done to promote registration for Engineering Technicians. The proposal for a high level conference was taken to the newly-formed Engineering and Manufacturing Skills Forum[19] and endorsed by them and by the Department of Trade and Industry (DTI). Hence, in November EC[UK] held a conference on the value of Engineering Technician registration for business, which was opened by Lord Sainsbury, and heard presentations by Lord Trefgarne in his capacity as Chairman of SEMTA[20] and President of the IIE. EC[UK] entered discussions with DTI about ways to promote adoption of Engineering Technician

[16] The Bologna Declaration, originally signed by the education ministers of 29 countries, including the UK, committed those countries to "converge" their higher education systems.
[17] Universities UK was at that time the organisation representing the majority of UK universities.
[18] Recognising previous criticism of SARTOR 3 for being convoluted and repetitious, with its multiple Guidance Documents.
[19] A forum for sector skills councils interested in engineering skills
[20] The National Training Organisation and later Sector Skills Council for science, engineering and marine training

registration, particularly in the context of the new Advanced Apprenticeships. ETB held a dinner at the House of Commons to discuss the issue with their business and industry panel.

EC[UK]'s first three year strategic plan was adopted in September. It emphasised the need for concerted efforts to market registration, as well as setting objectives for more effective promotion of Engineering Technician.

ETB changed tack on promotion of registration. An early initiative with focus groups petered out and it was decided to create a "challenge fund" and invite PEIs to bid for funding to pursue their individual marketing efforts[21].

The Registration Standards COmmittee worked with some PEIs to develop a means for employers to be more involved in the professional review[22]. A model approach adopted by the Institution of Mechanical Engineers with Rolls Royce was adapted for the armed forces. In due course this evolved into Specially Authorised Processes, which took advantage of the rigour of internal assessments for promotion.

Chris Simpson was appointed as EC[UK]'s Registrar and worked with the IT department to exploit increased flexibility in the design of the registrant database and internet access to allow approved PEI staff directly to update the database. Meanwhile the accredited courses database was made searchable on the EC[UK] website – enabling individuals to check whether their current or intended degree would satisfy academic requirements for registration.

2005

EC[UK] had achieved sufficient confidence for the PEIs concerned to allow it to become the permanent secretariat of the Degree Accreditation Board for Chartered Engineer (DABCE). DABCE had originally been set up by the PEIs themselves so that they could develop accreditation policy and even on occasion challenge the former Engineering Council. This had been a jealously guarded facility, enabling them to question and influence Engineering Council policy. It was therefore a further indication of the increasing trust and respect in which EC[UK] was held. Professor Bob Cryan, vice-chancellor of Huddersfield University, was appointed as the new chair, and the Board moved swiftly to merge the Joint Accreditation Panel. The latter had originally been set up to share approval of qualifications leading to Engineering Technician and Incorporated Engineer registration, but following implementation of SARTOR 3 had become involved in accreditation of bachelor degrees. It therefore made sense to join with DABCE, and the new committee was renamed as the Engineering Accreditation Board (EAB).

EC[UK] continued to experiment with marketing initiatives, publishing leaflets promoting CEng and IEng registration to supplement PEI materials. A "technical qualifications validation service" was launched to enable employers easily to check the credentials offered by candidates seeking technical posts.

[21] However, the lack of means to assess the viability of the proposals meant that much of the fund was wasted, with no discernable increase in recruitment of registrants.
[22] Assessment of candidates for registration.

In May Professor Fidler took office following his election as the second chairman of EC[UK]. Professor David Anderson took over the role of chair for the RSC. Urged on by the new EC[UK] chairman, RSC set up a working group, chaired by Professor Anderson himself, to examine the possibility of introducing a system of voluntary revalidation (see box).

Voluntary Revalidation

Many who had enthusiastically pursued the objective of universal CPD were frustrated by the perception of the inertia of the broad mass of registered engineers. This was by no means unique to the engineering profession. However, an argument against the universal submission of CPD returns was that they were evidence only of participation, not of new or renewed competence. Added to this, the costs of assessing CPD returns and dealing with those that were deemed inadequate had to be seen against the likelihood that the subscriptions of those undertaking little or no current practice would be likely to be lost. Many argued that there was in any case no evidence of widespread incompetence, and disciplinary machinery existed to deal with the few cases that arose.

Hence the idea of voluntary revalidation gained traction – effectively offering a full professional review and charging appropriately. Although relatively costly (estimated around £400 in 2005), it could be justified for engineers associated with high risk projects or those who wished to reassure their clients of their competence, and could perhaps become more widely adopted in due course.

The working group developed the proposal further, but it was generally unpopular with the profession at the time.

Other achievements in 2005 included:

- A database of qualifications leading to Engineering Technician registration was established through the tremendous efforts of EC[UK]'s Senior Education Executive, Ruth Wright[23].
- The Universities and Colleges Applications Service, UCAS, was persuaded to enable a flag to be added to the records of accredited engineering degrees. This facility was less valuable than it first appeared as only university faculty were allowed to amend the records, and they were slow to appreciate the value of promoting the accreditations they had been successful in achieving.
- After two years of joint work, with the Royal Academy of Engineering a framework for ethical principles was launched at the British Library, many prominent engineers attending.

2006

The setback of an ambivalent report by a panel of the Washington Accord concerning the profession's accreditation procedures (See International Recognition), prompted a review and

[23] Many PEIs were reluctant to share their hard-won knowledge of particular qualifications. Others did not see the database as a priority.

discussion of how these could be made more consistent between PEIs. Professor Anderson convened a meeting of Chairs of PEI accreditation panels to ensure understanding of the importance of the issue.

Langlands

Meanwhile perceptions that the professions were becoming less open to the upwardly mobile[24] led to the creation of a Development fund by the Higher Education Funding Council for England (HEFCE).

EC^{UK} successfully applied for funding from the Fund for a proposed MSc in professional engineering. This was designed to address the anomaly that full time MEng students were funded for a full four years, while three year BEng graduates had to pay to take the further MSc degree usually necessary to achieve Chartered Engineer registration. In addition there was evidence that the availability of good initial professional development schemes for graduates was in decline. These factors certainly acted as barriers to entry to the engineering profession.

The programme devised by EC^{UK} took advantage of the opportunity to create a work-based degree. It was decided that all such degrees should require a "learning contract" with an employer, and the prior support of a relevant PEI. It was intended that successful graduates should have gained sufficient experience to complete their preparation for a professional review. The Universities of Kingston and Northumbria were first to agree to provide the degree programmes, and the programmes were actually launched in 2007, with the first graduate gaining his CEng in December 2011. In addition it was agreed to offer a similar pathway for holders of higher nationals or equivalent to progress to BEng and to be able to apply for IEng professional review.

Diplomas

Considerable interest arose from the decision of the Labour administration to establish a system of 14-19 specialist diplomas. This was an attempt to revisit the aspirations for high standing vocational qualifications outlined by the Tomlinson Report (see page 19). EC^{UK} made submissions and worked with the Engineering Professors' Council and the Royal Academy of Engineering to influence proposals for an Engineering Diploma and a Construction and Built Environment Diploma.

CSCS

After two years of petitioning the management of the Construction Skills Certification Scheme (CSCS), EC^{UK} was successful in gaining recognition to enable them to obtain a "professional card" for all three registration categories (subject to completion of a health and safety test). The importance of this was that it allowed professional engineers and engineering technicians easier access to construction sites, under the tighter site regulation that had been progressively introduced by the major construction contractors. Almost as important was the fact that the issue of these cards had originally needed evidence of holding a relevant National Vocational Diploma (or equivalent). Professional engineers and engineering technicians had been obliged to demonstrate that the assessment for their registration had been at least as demanding and relevant. It was clear that

[24] The Langlands Report, published in 2005 by BIS (see http://bit.ly/I8j4p7)

there had been initial scepticism about the rigour of EC[UK] registration so the issue of the cards was an endorsement of the UK-SPEC standard.

Technologist

The success of the British Institute of Architectural Technicians[25] in gaining a charter with a right to award the title "chartered architectural technologist" reopened discussion on whether EC[UK] should seek powers to create their own technologist registers. A working group, chaired by Isobel Pollock, was set up to explore the issue again. However, their research found only mixed support in the profession and it was agreed to postpone any decision for at least 12 months.

Other achievements in 2006 included:

- QAA adopted UK-SPEC output standards as their benchmark for bachelor engineering degrees and published this in April. (A masters benchmark was published four years later).
- a "baseline survey" of employers was set up to assess the early impact of UK-SPEC, and to ensure that the competence standard continued to align with employer needs and expectations.
- Andrew Ramsay was invited to join the Board of QAA.
- the profession started to experiment with remote professional review interviews (i.e. those where one or more of the interviewers was not physically present with the candidate). RSC issued guidance on when they could be appropriate, and how to ensure rigour.

2007

George O'Neill took over the RSC Chair from Professor Anderson. As Wing Commander Ground Training, he was responsible for much of the RAF's training of their engineering technicians and therefore well-placed to ensure focus was retained on the success of the Engineering Technician register. An indication of growing enthusiasm for the qualification was seen in the application by the Institution of Mechanical Engineers for a licence to award the title, and the licensing of a new PEI, the Institution of Royal Engineers initially simply to award the title. (The Institution of Chemical Engineers was the last of the "Big 4" to seek Engineering Technician licensing, gaining this in 2009).

A report on Incorporated Engineer – suggesting a "repositioning" – was published by RSC, but subsequent discussion with PEIs confirmed the lack of appetite for the principal recommendation of a name change for the grade. Nevertheless, a number of useful proposals were made on how the competence requirements for CEng and IEng could be clarified by a treatment similar to that used for the EngTech part of the Standard – explaining typical ways to demonstrate that competence had been achieved. These were later incorporated on the relaunch of UK-SPEC in 2009.

Much annoyance was caused by a combative report from the Higher Education Regulatory Reform Group – commissioned by Ministers – which accused the professions of creating unnecessary burdens for universities through their accreditation practices. A robust response by Professor Fidler led to a meeting with the Higher Education Minister, followed by an invitation for EC[UK] to lead a

[25] Now the Chartered Institute of Architectural Technologists

seminar for professional bodies demonstrating the good practices employed by the engineering profession.

The final specification for the Advanced Engineering Diploma was published, with the expectation that the Department of Education would introduce the qualification in September 2008. The Engineering Professors' Council had worked hard to ensure that the mathematics content gave a good grounding for progression into engineering degrees – and in many respects the content was superior to the standard mathematics A level. However concerns about resourcing and curriculum time were starting to surface[26].

In June EC[UK] and ETB moved to 246 High Holborn from the Engineering Council's original premises in Maltravers Street. The landlords of Maltravers Street had terminated the leases of all the tenants, in the expectation of reaping the benefits of an office-building boom that was affecting the capital at the time[27]. This in turn meant that finding new premises at reasonable rent was rather difficult. Largely by good fortune the two organisations were able to take on the last couple of years of an expiring lease in Holborn. The boom was over by the time the lease needed to be renewed and favourable terms were secured. In the meantime the two organisations had taken the risk of extensively refurbishing the new offices, which were opened by HRH the Duke of Kent (president of the Engineering Council) in October.

The Duke of Kent – Engineering Council President

The Duke of Kent became President of the Engineering Council in 1989 (see Chronicle p58). Despite the change in the status of the Engineering Council in 2002, His Royal Highness indicated that he wished to maintain his interest in EC[UK]'s work. In addition to opening the offices at High Holborn, he was regularly briefed by the Chairman and Chief Executive, and always showed great enthusiasm for the Council's work.

The 2006 Charities Act obliged the Charity Commission to ensure that fee-earning educational charities were actually working in the public interest. Although clearly aimed at independent schools, the guidance they issued was so broad that it entangled all sorts of charities, including professional bodies like EC[UK] and the PEIs. EC[UK]'s Privy Council and Regulations Panel, advised by Philip Corp and Keith Lawrey, developed a template to enable the PEIs to respond to the regulations.

During 2007 EC[UK] was given access to a marketing consultant, David Falzani, who had been nominated by the Sainsbury Management Fellowship to assist in promoting registration. ETB, although initially enthusiastic, decided not to adopt the programme offered. In consequence Professor Fidler took the proposals to the ETB Board in December, securing a commitment that they would help fund an EC[UK] marketing initiative based on the Falzani proposals.

[26] Only a relatively small number of Advanced Engineering Diplomas were ever awarded and the programme was effectively abandoned when the new government took over in 2010

[27] In the event the bubble burst and Maltravers Street stayed empty for a further six years before developers moved in.

Other achievements included:

- a working group was set up under the chairmanship of Professor David Bogle to develop a Code of Practice on Sustainability. This was intended to clarify the sustainability requirements of UK-SPEC and to fill the gap in guidance when the former Engineering Council failed to complete a replacement for the 15-year-old environmental code of practice. It was published in early 2009.
- following almost a year of discussions with PEIs (after the British Library seminar mentioned earlier – page 22), the Royal Academy of Engineering, supported by EC^{UK}, was able to publish a Statement of Ethical Principles for professional engineers. Further work was undertaken on an ethics curriculum for engineering undergraduate programmes, and case studies that could be used in this and other awareness-raising work.
- the "baseline survey" results were published. They convincingly endorsed the current requirements of UK-SPEC.

2008

Encouraged by the enthusiasm from Lord Sainsbury for pan-industry standards for technicians, and with the strong support of the IET, a standard for a new register of Information and Communications Technicians was devised (ICT*Tech*). The British Computing Society, although initially interested, decided not to seek a licence. Chris Nott chaired the working group and the standard was published on 20 November. IET gained a licence to award the qualification in the following February. Unfortunately despite wide-ranging support applications ran at a fairly modest level for the period of this review.

In May Prof Fidler was re-elected for a further three years as Chairman of the EC^{UK} Board.

Meanwhile the marketing plan devised by Falzani went into high gear. A steering panel was convened, chaired by Nigel Guild – who had been appointed in April as Board Deputy Chair and Chairman of its Finance Audit and Remuneration Panel.

Rear Admiral Nigel Guild CB

Nigel Guild joined the Board of EC^{UK} in 2005. He served as Deputy Chair from 2008 and was elected Chairman of the Board in May 2011.

His naval career began in 1966. He served at sea as a Weapons Engineer Officer and subsequently on the staff of Flag Officer Sea Training. His shore appointments were mainly in the Procurement Executive, culminating in service on the Admiralty Board as Controller of the Navy. Rear Admiral Guild's final appointment was as Senior Responsible Owner for Carrier Strike, in the Ministry of Defence. At the same time, he also held the post of Chief Naval Engineer Officer. Guild holds a PhD in mathematics as well as a Cambridge University engineering degree. He retired from the Navy in 2009.

The marketing plan began with an intensive phase of data gathering on current and potential registrants, and was supplemented with "mystery shopper" and "single electronic application form" initiatives, which were intended to improve the experience of applicants seeking registration.

In February the House of Commons Select Committee for Universities, Innovation, Skills and Science (checking and reporting on the government Department of the same name) announced an inquiry into "engineers and engineering". As this was the first national review of the profession since the 1980 Finniston Report, the inquiry was seen as a good opportunity to raise the profile of the profession and make Parliament and government more aware of its contribution.

ETB co-ordinated a joint submission, supplemented by individual submissions by EC[UK], the Royal Academy of Engineering and various PEIs. Oral evidence was heard from EC[UK], the Academy and ETB on 7 May, and it was clear that the Committee, chaired by Phil Willis, was already concerned about what they described as the "plethora of organisations" involved.

The approach of the Committee seemed to have a salutary effect on the cohesion of the profession. Before its report was published in May 2009[28], a small policy group consisting of representatives of EC[UK], ETB and the Big 4, and led by the Royal Academy of Engineering was working to prepare joint papers and responses to government initiatives[29]. Liaison with the other PEIs was established through a Professional Panel convened by ETB, at which all PEIs were represented.

The Report of the Select Committee praised the international standing of chartered engineers and took the government to task for failing to acknowledge the importance of engineering expertise in their own advisors.

Isobel Pollock took over from Philip Corp as chair of the Quality Assurance Committee. Its work of assessing and granting licences to award titles and accredit courses continued. It also took responsibility for increasing the number of Professional Affiliates. After a period during which EC[UK] had shied away from recognising more than a few engineering membership associations without licences, it had been recognised that the profession would be strengthened by a formal programme to recognise new or aspiring membership associations. This ensured that EC[UK] had the opportunity to influence good practice in a wider array of engineering bodies and also gave an opportunity for some to aspire to full licensed status, as their branch of engineering matured or became more economically successful. It also, incidentally, provided a staging post for PEIs who were finding the processes of registration too onerous, but who still wanted to maintain recognition by EC[UK]. During 2008 the number of Professional Affiliates increased from 14 to 19.

At its meeting in January RSC members agreed that root and branch revision of UK-SPEC, beyond any changes agreed as a result of the IEng review, was unnecessary, but that the opportunity should be taken to re-present UK-SPEC. UK-SPEC was republished as a single document, incorporating all three registration categories, with these being presented as a potentially progressive structure from EngTech to IEng to CEng. This was welcomed by institutions during the consultation process. The launch took place at Mary Ward House, Tavistock Place, on 18 December.

[28] *Engineering: Turning Ideas into Reality* HC 50-1
[29] This became the *Engineering the Future* group – see www.engineeringthefuture.co.uk

2009

National policy developments supported EC[UK] themes. A Cabinet Office Panel to look into "fair access to the professions" was appointed in January, the Rt Hon Alan Milburn MP chairing. It had been commissioned by Prime Minister Gordon Brown to seek means to promote social mobility – and was intended to build on the previous initiative that had led to the 2005 Langlands Report (see page 28).

This time EC[UK] had even more evidence of good practice to offer, and received several mentions in the Final Report of the Panel[30].

A White Paper in the autumn endorsed Lord Sainsbury's enthusiasm for technician registration schemes and set in train moves to create a Technician Council, which was established in July 2010, notwithstanding the change of government in May.

Sue Brough was appointed as a full time Communications Manager (subsequently as Director of Marketing and Communications) and the Department was strengthened by transfer of Tammy Simmons to it. It was decided to respond to the developing economic downturn with a "registration in the recession" campaign, which used internet tools and advertisements to generate several thousand new expressions of interest in applying for registration, which, after initial sorting, were distributed to the PEIs to process. Work with BAE Systems resulted in a breakthrough in registration policy which enabled the company – employing nearly 10,000 engineers – to support their drive to professionalise.

Towards the end of the year a Board Retreat reviewed the progress that had been made since 2002, particularly in the global reach of EC[UK] and its success in representing the profession internationally. Recognition of CEng, IEng and EngTech had been strengthened and nearly 20% of registrants had overseas addresses. In consequence it was decided to drop the "UK" – enabling the organisation to revert to its original Engineering Council name. The move was unanimously supported by PEIs, who by now had little corporate memory of the pressure they had applied to rename what had been seen as a failing organisation in 2002.

A gentle rebranding of the organisation took place, adapting the diagonal square logo by simply removing "ECUK" and adding the words Engineering Council beside the squares[31].

A further development was the transfer of an internet-based professional development recording and management system, hosted by ETB, to the Engineering Council. This enabled the scheme to be made available to all PEIs – using the *MyPath* branding - and ensured it met Engineering Council standards.

In September Andrew Ramsay announced his intention to retire by the following July and a recruitment process was put in hand to secure a successor.

[30] July 2009: *Unleashing Aspiration* http://bit.ly/Js41q4
[31] ETB also chose to rebrand at this time, becoming *EngineeringUK*

2010

The intensive marketing campaigns of the previous two years were starting to bear fruit. By the year end a 26% increase in the number of new final stage Chartered Engineers; 64% increase in the number of new final stage Incorporated Engineers, and 12% increase in the number of new final stage Engineering Technicians compared to 2009 had been recorded[32].

Following the encouraging reception for the Code of Practice for Sustainability, it was decided to prepare a Code of Practice on risk. Professor Bogle agreed to chair the working group and the Code was published in March 2011.

New guidance notes to assist with academic accreditation and for assessment of individual route applications were issued

The technician qualifications database finally became publicly available.

The Engineering Council created a new class of Associates, providing a means to acknowledge the contribution of individuals to the work of the Council. (It also enabled continued engagement of many of the key volunteers involved in the success of the Council). 22 Associates were appointed at a special ceremony in October.

Andrew Ramsay retired in July and Jon Prichard became CEO. Prof Fidler remained as Chairman for a further 8 months, handing over to Nigel Guild in May 2011.

[32] Unfortunately demographics were still a problem. With a high proportion of registrants over the age of 60, and many years of poor marketing to recover, the register continued to shrink in total numbers.

International Recognition

International trading in goods and services was an important part of the global economy long before the founding institutions of the engineering profession were established. Nevertheless, it was British engineering that was carried out to the rest of the world on the wave of industrialisation that stemmed from the Industrial Revolution. In this way British engineering gained an enviable reputation in most parts of the world touched by this early industrialisation.

Unsurprisingly, significant numbers of UK-registered engineers are actually domiciled in other countries. At the end of 2010 they amounted to just under 18% (42,516) of the register of professional engineers and technicians who satisfy Engineering Council requirements for recognition[33]. However, as other countries developed their own engineering professions, an element of restricted practice has come into play. Particularly in the area of construction, most countries confine final signing off of design or structure to engineers registered locally. In some cases this means a particularly parochial restriction[34]

While convenient for national work, this attitude creates difficulties for trans-national working. Attempts to bring in new techniques and experience from outside a country become complicated. Perhaps more of a hurdle for enterprise is the difficulty of satisfying local health and safety or environmental considerations for products that are made up of sub-assemblies and components from all over the world. This was a defining characteristic of late 20th century trade, with for instance motor vehicles, civilian aircraft and electronic consumer goods increasingly "international" in manufacture. A significant aspect of this was the trust being placed in the professional competence of the engineers involved in design and manufacture of key components and sub-assemblies.

Almost inevitably this drove a wish to build on the protocols for recognition developed by the former Engineering Council, through the efforts of Professor Jack Levy and others in the 1980s[35].

Turmoil

Thus it was that the new EC[UK], with a tentative objects clause concerning its role in international recognition[36] (see also the Section *Early Days*) found itself drawn into the centre of two major upheavals in the international scene.

An International Advisory Panel was formed under the chairmanship of David Long and met for the first time on 4 October 2002[37]. It found that the European scene was in turmoil. A Bologna

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[33] Engineering Council Annual Statistics 2010

[34] The United States registers engineers state by state and in Italy it is necessary to be registered in a local Ordine. In both cases some states (Ordine) place restrictions on practice by those registered in other states (Ordine).

[35] See *An Engine for Change* : Chapman and Levy 2004

[36] *[the Engineering Council] shall in conjunction or collaboration with Licensed Members, act as the representative body of Our United Kingdom in relation to the international recognition of registrants and of qualifications in engineering and related subjects and disciplines*

37 A "final" meeting of its predecessor, the International Advisory Committee, had taken place in June 2002, but it had largely been concerned with parking its responsibilities pending a policy decision on the role, if any, of the new Panel.

Declaration had been signed in 1999[38], committing dozens of signatory countries, including the UK, to converge their higher education systems. The Declaration also incorporated an undertaking to establish an academic credit system to assist student mobility, and the adoption of a "two-cycle" system of higher education - the first cycle being a bachelor degree, and the second a masters degree. While the UK Department of Education initially dismissed the importance of the Declaration, suggesting that it merely showed how keen the countries of continental Europe were to emulate the success of British higher education, those delegates of the Engineering Council who attended FEANI and bilateral meetings on the Continent found this complacency to be misplaced.

The Declaration was causing such strains within the European Federation of National Engineering Associations (FEANI) that France and Norway had resigned, while within European countries the higher education establishments were being painfully redesigned. The two-cycle model meant, in effect, tearing apart the 5 year engineering diplomas well understood by employers and academics in most of continental Europe[39]. The logic said that these degrees would be three year undergraduate and two year masters. Understandably, their engineering associations could not see why Britain should not be sharing the pain. The 4 year British MEng, which had taken 25 years to be adopted after the Finniston Report had recommended it, suddenly looked out of step and rather thin. Furthermore, the emerging European Credit Transfer System – the means to compare degrees – took no account of the long UK vacations and little of non-contact study time.

The major concern was not so much comparability of study time or cycle length so much as the rupturing of the European Engineer agreement, developed by FEANI. This had enabled recognition of the UK's requirement for a period of initial professional development - integral to the UK model of formation - such that the time involved could be matched to the longer period of academic study on the continent. In continental Europe an engineer was technically regarded as professionally qualified as soon as he or she had completed their Diploma. The European Engineer agreement had required a further period of relevant experience before international recognition, and this had provided the means to allow recognition of UK engineers, despite most having only completed a 3 year degree (4 years in Scotland).

Europe - The Key Players

A small number of articulate and experienced individuals were deployed to argue the UK's case. Amongst these was Professor Ernest Shannon. Shannon had been a President of the Institution of Mechanical Engineers[40], but had begun his engineering career as an apprentice, and ended his full time career as a director of a major corporation and a full professor. He was in a good position to argue from both his personal and his employer role about the relative value of initial professional development. He was re-elected to membership of the FEANI Board at this crucial time[41].

FEANI's European Monitoring Committee (EMC) was the gateway for non-standard applications for European Engineer registration and hence where all the hard case-law was made. Attempts to dismantle the European Engineer agreement from within could be challenged there. Jim White

[38] See http://ec.europa.eu/education/policies/educ/bologna/bologna.pdf
[39] France had a different problem, most professional engineers holding a Grande Ecole 3 year Diploma, taken after an intensive 2-year post-Baccalaureat preparatory study.
[40] 1996
[41] 2003

became the UK's representative on the EMC. Jim brought solid academic credentials as a university-based structural engineer. He joined David Rogers. Rogers had retained his long term position on the Committee as a FEANI expert. As a regular chartered engineer interviewer, and a member of the Institution of Civil Engineers' Membership Committee, Rogers had long experience of the exacting membership requirements of the ICE. Importantly, he had played a leading role in the development of the Engineering Occupational Standards Group operated by the Engineering Council in the 1990s, and thus had good arguments on the importance of competence alongside academic achievement – a key part of the UK's position (see Annex B for a description of SARTOR 3).

Professor Alan Pugh was a nominee of the Institution of Electrical Engineers[42]. He had many years of experience as a member and Chair of their Accreditation Committee, having taken part in or chaired accreditation visits to universities all over the world. He agreed to represent the UK in a newly-formed body called ESOEPE (the European Standing Observatory for the Engineering Profession and Education). This strangely titled body had been set up to share experience of accreditation of engineering degrees, and in the hope that a common approach might emerge. The UK had a longer experience of independent accreditation than any other European country[43] and hoped to influence the other members of FEANI to adopt an outcomes approach independent of study time.

Dr Jim Birch had joined the Engineering Council in 1999 to support the work of Nomination and Audit[44] (quality assurance assessment of PEIs seeking to gain or retain the right to accredit individual engineers for registration). His international experience with the trade association for the zinc industry meant he had become increasingly involved in the Engineering Council's international affairs and so he was formally appointed Head of International Recognition, working with the new International Advisory Panel, in 2002. Birch co-ordinated the EC^{UK} international approach and worked closely with the others to draft papers to FEANI Board - particularly on the subject of the level of academic achievement required for recognition of professional engineers, which was an important part of a proposed European Directive (since enacted as Recognition of Professional Qualifications Directive 2005/36/EC).

Beyond Europe

Outside of Europe the Washington Accord[45] was showing signs of strain, but for almost diametrically opposed reasons. The third edition of SARTOR[46] required engineers seeking registration to gain at least four years of higher education for registration in the UK[47]. The Washington Accord had provided that the highest degree for practice in each member country was sufficient for recognition in the other signatories' countries. In the UK individual professional engineering institutions were

[42]The Institution of Electrical Engineers (IEE) became the Institution for Engineering and Technology (IET) in March 2006.

[43] with the possible exception of France, although the French Commission des Titres d'Ingeniers was part of their civil service

[44] Nomination and Audit was overhauled to formally become quality assurance in 2002.

[45] The Accord, created in 1989, commits signatories to recognise the "substantial equivalence" of each others' academic qualifications for recognition as a professional engineer.

[46] Published September 1997

[47] The requirement was effectively staged, and only started to become an issue as course accreditation was renewed – basically from 2003 onwards.

starting to question why they should accept three year engineering degrees from Australia or South Africa when they were having to turn away UK graduates with BEngs. (The parallel issue of the bachelor degree requirement for Incorporated Engineers, did not become much of an issue. By the time UK IEngs needed BEng degrees, Canada and Ireland had moved to the same requirement[48].)

Overlaid on this was "hammering on the gates" as an increasing number of countries who had not been members of the Washington Accord started to see the value of benchmarking their engineers against this standard. The Washington Accord members would have been unable to resist this pressure, not least because the General Agreement on Tariffs and Trade (to which all their countries were signatories) had spawned a General Agreement on Trade in Services – in 1995. This was aimed at sweeping away entrenched monopolies in the supply of services, which of course included consulting engineering. The Washington Accord could only continue by demonstrating that the standards of applicant engineering associations were being judged objectively and fairly. However, the Accord signatories were very much in favour of widening the Accord, seeing this as a way to increase its stature. Nevertheless the resources and energy required to manage this change was affecting the Washington Accord significantly.

To many it appeared that the Washington Accord had prospered because the member countries had felt "comfortable" with each others' systems of formation of engineers, while avoiding the need for any costly rigour to ensure their confidence was not misplaced.

If that was not all, the Accord seemed to have been superseded for signatory Pacific states by the announcement of the APEC Engineers Register. This organisation, though initiated by the forum for Asia-Pacific Economic Co-operation (APEC), was actually an offshoot established in 1999 to promote the principle of "substantial equivalence" in the standards for registration of professional engineers in the member economies. Furthermore an Engineers Mobility Forum was set up in 1998 with the intention of building on bilateral mutual recognition agreements between Washington Accord professional engineering registers. In June 2001 the Sydney Accord (recognising the academic credentials required for registration as an Incorporated Engineer[49]) was signed by a subset of the Washington Accord national members and in May 2002 the Dublin Accord (recognising the academic credentials for registration as an Engineering Technician) was launched.

A result of this flourishing of recognition agreements was, at first anyway, a reinforcement of belief in the UK's own standards. This was followed by a dawning realisation that something more formal than the biennial conferences enjoyed by the Washington Accord members would be needed to co-ordinate standards-making and assessment. The public image of these tangible enhancements to trade also required careful promotion.

The team sent out to deal with these issues by the International Advisory Panel consisted of David Long – its Chairman, and an internationally experienced Deputy CEO of the Institution of Marine Engineers, Scientists and Technologists, who had a distinguished career as a marine engineer; Barry Dobson, Chairman of the Council of the Institution of Incorporated Engineers and a former head of engineering in a major FE College; and Jim Birch. (Inevitably their success built on the work of others. In particular Robin Wilson, Professor Patrick Dowling and Dr Matthew Dixon sustained

[48] Sydney Accord – signed 2001

[49] In most signatory nations styled "technologist"

support for international recognition at Engineers Mobility Forum Meetings in 2000 and 2001, while the Engineering Council itself was uncertain of its future).

The First Meeting of the International Advisory Panel

EC^{UK} Board Retreat of September 2002 had addressed the question of whether the profession benefitted from international involvement by EC^{UK}. There were many who doubted that much could be achieved other than some nice trips for well-connected volunteers. However, as the number of overseas registrants and the breadth of international challenge facing the UK profession became apparent to the new Board, the Board readily agreed that the IAP should proceed, albeit with a modest budget.

At the Panel's first meeting in October of 2002 it was decided to establish a working group to plan how the profession should react to the European Recognition Directive proposals. There was evidence that the Panel felt frustrated by the Board decision to overhaul SARTOR. This left them struggling to make a response to challenges by Malaysia and Singapore within the Engineers Mobility Forum. The Malaysian regulatory body, Institution of Engineers Malaysia, had unilaterally decided to reject all UK-accredited BEng degrees for registration of professional engineers in Malaysia, even though most pre-dated SARTOR 3 and were still acceptable for CEng registration. Singapore's Professional Engineers Board was continuing to pick and choose which UK degrees they would recognise – apparently on the basis of a list of accredited programmes that was becoming seriously out of date.

Meanwhile the relentless drive to establish more international registers continued, with the establishment in 2003 of the Engineering Technologist Mobility Forum – based on the Engineers Mobility Forum - and the decision to offer a title, IntPE, to registrants successfully meeting the standards of the latter. It was little wonder that the Panel expressed concern at the paucity of resources at their disposal, and that they queried the value of maintaining membership of EurEta – a European registration system for engineering technicians. Nevertheless there was an awareness that eventually some resource would be needed to establish a paid secretariat for the Washington Accord and its associated agreements, and acknowledgement that the work involved in supporting the Engineers Mobility Forum could only be justified if member countries could be persuaded to publish the benefits they were prepared to offer to EMF registrants.

Aware that the challenge to the international work of the former Engineering Council had arisen largely because of ignorance within the professional engineering institutions of the nature of its work, it was decided to plan a seminar for staff and officers of the PEIs specifically to discuss the looming issue of the European Directive.

2003

Early 2003 saw a successful seminar. In the same year the Engineering Council decided to throw its weight behind a proposal for a "common platform". The European Commission had been suffering from the costs and bureaucracy of running various "Sectoral Directives" to regulate certain professions. The common platform proposal had been developed to bring all professions under a common umbrella Directive, without additional regulation by the Commission. It looked like the

means for FEANI's existing EurIng mutual recognition scheme to be adopted by the Directive on the basis that it provided the means for mobility of professionals which could evolve and develop as the profession saw fit. Malcolm Harbour MEP agreed to assist the UK, and proved a good supporter.

It emerged that officials in the European Commission had based the proposal for "common platforms" for the professions on the FEANI European Engineer, so they were very surprised when it was found not to have the enthusiastic support of many FEANI members. If anything it brought mutual suspicions to the surface, and the profession continued to fragment, with Spain threatening to leave FEANI, the Austrians refusing to endorse any decisions by FEANI, and two new European organisations – a European Chamber of Engineers, and CLAIU (an association of "long-cycle" professional engineering societies) gathering disparate groupings of professional engineering associations to fight the proposals.

On the Washington Accord scene, the UK was becoming a partner of choice for aspiring members of the Accord and the EMF. India, Bangladesh, Malaysia, and Singapore all sought UK sponsorship to join the latter. So also did Germany, though an alarming report that UK NARIC[50] suggested that they were trying to establish international credibility for their newly-minted 3-year bachelor degrees (this would imply superiority over Washington Accord qualifications for the holders of the 5 year Dipl.Ing. At the same time the willingness of UK PEIs to observe demarcation of accreditation zones was put in question by a complaint by the Institution of Engineers of Ireland about accreditation activity in the Republic by the Institution of Chemical Engineers.

2004

In 2004 the "observatory", ESOEPE, successfully spawned a European Consortium for Accreditation, which late in 2005 became the European Network for Accreditation of Engineering Education (ENAEE). Prof Ian Freeston was deputed to serve on this latter body, which succeeded in developing a "super-accreditation" system for national accreditation bodies. Engineering degree programmes that satisfied the requirements of EurACE subsequently became eligible for the EurACE "label". This was launched in 2007, and proved attractive to many continental universities, as it provided a means to challenge and develop engineering programmes which, in many countries, were constrained by state bodies. It took a bit longer to take root in the UK, where the advantages of an additional label over and above CEng or IEng accreditation were more difficult to sell – especially as, unlike for Washington Accord recognition, an additional charge was made.

International developments were otherwise still complex. The World Federation of Engineering Organisations (WFEO) met in Tunis and proposed a "World Engineer" register. The UK had been a leading member of WFEO for many years[51], but had parted company in 1999, in the period leading up to the reform of the Engineering Council in 2002. This was largely because it was seen as an example of Engineering Council profligacy in supporting a body that apparently provided little benefit to the UK profession. Subsequently, the Institution of Civil Engineers had responded to

[50] The National Recognition Information Centre for the United Kingdom – a national agency providing the only official source of comparison information and advice on international education and training systems and overseas skills and qualifications.

[51] WFEO had provided the forum which enabled the development of the Washington Accord in 1989

senior members' pressure by joining as the UK member, but by 2004 they were already trying to find an alternative representative, but the IEE, the ETB and EC[UK] were unwilling to assist.

It was against this backcloth that the unwelcome news of yet another international register – this time sponsored by the World Federation of Engineering Organisations (WFEO) - was heard. Fortunately the remaining Washington Accord members of WFEO worked hard behind the scenes to persuade other countries that the Washington Accord was open to their applications, and far more likely to enable global recognition of their engineers.

In Europe the battle over the Directive raged. For a time it appeared that the Italian Association had a hold over the thinking of the European parliament on the issue. MEP Stefano Zappala was highly critical of the UK position, speaking in the European Parliament in Strasbourg in early 2004 of "arrogance" and "self-interested lobby groups"[52]. Fortunately his view did not prevail, and although the "common platform" was lost, the eventual form of the Directive, when it was published in 2005, was more in tune with UK thinking, in particular by specifying a minimum of 4 years higher education as the requirement to practice a profession at the highest level.

The annual meetings of the Washington Accord groups[53] were settling down into a cycle of alternate planning meetings (workshops) and full meetings. Although this issue was raised by the UK in 2003, it was in the 2004 Workshops where the idea of using "graduate attributes" rather than time served or more subjective measures to distinguish accreditable degrees was discussed. This was strongly supported by the United States' Accreditation Board for Engineering and Technology (ABET), whose Engineering Criteria 2000 standard, like the more recent UK-SPEC, linked accreditation to outcomes. Nevertheless, relationships with the USA were cool as it emerged that one of the reasons they appeared reluctant to honour recognition of Washington Accord degrees was that they were earning substantial income from ECEI – their programme for assessment of engineering degrees held by migrants to the US.

2005

In 2005 the UK profession received its first review visit under the Washington Accord. This involved participation in accreditation visits by IChemE and the JBM[54]. The visiting panel was led by an ABET member with strong views. Although the Washington Accord board later spent nearly a year considering the findings, the UK was eventually given a full licence, subject only to reporting back on two particular sticking points – the practice of compensation, where failed degree modules could be compensated by better than average performance elsewhere; and protocol on whether the start or finish date of a degree was the appropriate way to record accreditation. On both these matters the UK was urged to follow US practice.

The Hong Kong Workshops for the Washington Accord group received a paper from the UK, drafted by David Long and Jim Birch, called *Managing Change*. This built on understanding reached about

[52] Debate 15 January 2004 - http://bit.ly/xrMXgN

[53] Consisting of the Washington, Sydney and Dublin Accords, the Engineer and Engineering Technologist Mobility Forums, and APEC for professional engineers

[54]The Joint Board of Moderators – a joint accreditation board consisting of the Institution of Civil Engineers, the Institution of Structural Engineers, the Chartered Institution of Highways and Transportation, and the Institute of Highway Engineers

the importance of graduate attributes to promote the idea that the new standards being applied in the UK were part of an international trend, in which all Accord members would need to consider how their registration requirements should adapt. The importance of these international meetings was further reinforced by a common acceptance that the funded secretariat proposed in 2003 would have to be established very soon to handle the volume of business.

2006

Reflecting the arguments in the *Managing Change* paper, the first IAP meeting of 2006 was greeted with the news that the University of Melbourne had decided to move to a "Bologna" framework, promoting a 3+2 system of broad three year undergraduate degrees followed by two year specialist masters degrees. By late 2006 the USA's National Council for Examining Engineering and Surveying (NCEES)[55] had announced that by 2015 they would be seeking for all newly qualifying professional engineers to achieve a masters degree. Thus it was that the 2007 Washington Accord meeting agreed to set up a Managing Change Working Group, and appointed EC^{UK}'s nominee Bob Cryan, Vice-Chancellor of the University of Huddersfield, as its chair.

Within Europe things were beginning to settle down. France and Norway rejoined FEANI. However, the FEANI secretariat was enthused by the idea of a "professional card". Based on studies funded by the European Commission, it was proposed that such a card would facilitate mobility and recognition around Europe by both certifying the professional status of the holder and recording details of his or her education and experience. The IAP were less keen, suspicious that this could be a rearguard action by countries looking for easy ways to find fault with educational background, and in any case could prove an expensive nightmare to police and to keep updated. This debate rolled on within FEANI for a further four years, with successive attempts to establish a card. Eventually, in 2010 the German national association, VDI, created its own card, inviting other FEANI members to participate if they felt it would be of value. Although the UK remained sceptical of the value of the cards, by then EC^{UK} had ensured that FEANI endorsement for national cards had to be on the basis of the criteria and QA procedures developed by EC^{UK} itself.

2007

Qualifications fraud was starting to become an issue by 2007. EC^{UK} staff were regularly finding examples of spurious degrees, and even websites selling "CEng" certification. Staff worked hard to advise and support membership staff in the professional engineering institutions. They were helped considerably by UK NARIC who, recognising the problem, laid on a pan-professions conference and also presented to an EC^{UK}-organised seminar for PEIs. Relationships with UK NARIC prospered at this time. Previously UK NARIC had steered clear of taking advice from professional bodies, preferring to give advice to clients on the basis of their knowledge of the quality of overseas educational institutions, rather than the extent to which they had achieved international acceptance of their vocational degrees. Through Jim Birch's contact they gained confidence in the international insights provided by the UK profession, which proved helpful in due course for the Engineering Council's attempts to influence migration law.

[55] The gateway to professional practice as a PE in the USA. Many universities run their Fundamentals of Engineering (FE) examination alongside the degree finals. Most States require it for practice as a civil engineer.

The UK government had decided to adopt a points-based system to control migrants who wished to enter Britain from outside of the European Community. One of the criteria was the level of education achieved. Monitoring development of the policy, the EC[UK] realised that no acknowledgement of professional registration was envisaged. Not only would that be unfair to overseas registrants who needed to work in the UK, but it implied that academic qualifications were all that mattered – playing into the hands of those on the Continent who believed that the UK's professional engineers were under-educated.

David Rogers died in late 2007, leaving a void in the international activities of the Engineering Council. He had been deeply involved in its work from its earliest days, but most recently had helped to build trust and understanding of the UK's position in the fraught issue of equivalence of qualifications within Europe.

David Long agreed to a one-year extension of his Chairmanship of IAP until December 2008 (part of a restructuring of Board representation to enable some overlap with incoming Board members). The success of the IAP while he had been chair was shown by the fact that by this time one third of all web enquiries being received by the Engineering Council were regarding international recognition and related issues. The suspicion that had characterised early relations with the professional engineering institutions had dissipated, and the seminars organised for them by the Engineering Council were popular and well-attended.

2008

In 2008 a Memorandum of Understanding was signed with the Saudi Arabian Engineering Council, and with the China Association for Science and Technology (CAST). China had participated in meetings of the Washington Accord, now known as the International Agreements Meeting (IEM), as an observer. At the IEM Workshop, held in Singapore, there was a growing consensus in favour of the objectives set out in the UK's *Managing Change* paper. Nevertheless problems continued with members of the Washington Accord. Singapore and Malaysia continued to query UK professional qualifications and both the USA and Canada continued to be coy about the extent to which State (or Province) based organisations were prepared to recognise qualifications blessed by the Accord.

A paid secretariat was established for the International Agreements support – hosted by the New Zealand Institution, IPENZ, and styled the International Agreements Alliance (IEA). A governance group was established, with David Long elected Chairman.

In Europe Greece challenged UK accredited engineering degrees and was reported by the Engineering Council to DIUS and SOLVIT[56].

2009

Europe continued to trouble the IAP in 2009. The momentum behind the Bologna Declaration proposal to establish criteria for comparison of degrees had resulted in a standard for the European Credit Transfer System (ECTS) that seemed to be biased against UK degrees, both in terms of the number of contact hours required for each credit, and the concentration on contact time rather than personal study time. Despite evidence that many countries were rather generous in their

[56] An EU sponsored network of centres dedicated to resolving disputes over the application of EU law.

assessment of contact time, the UK's degrees again felt vulnerable. Meanwhile the management of the ENAEE project became erratic, just at the time when the Engineering Council's representative Alan Pugh was about to step down. Philippe Wauters, FEANI's energetic and far-sighted Director General, also announced his retirement.

Graham Woodrow, an experienced Director from the Institute of Mining Metallurgy and Materials, took over as Chairman of IAP. David Anderson succeeded Jim White on the FEANI EMC and George O'Neill became active in the IEA.

The Panel were delighted to read in the Select Committee Report on the Engineering Profession, published in May, that they had found in their research that "British engineers and engineering firms are considered to be amongst the best in the world"[57].

At the 2009 IEA Meeting in Kyoto the graduate attributes originally proposed by the Engineering Council were adopted, and Hong Kong announced a programme to develop longer degrees for engineering. However, the Indian accreditation body that had been seeking UK support for its application to be recognised under the Washington Accord collapsed with the news that their Director General had been involved in corrupt practices with respect to accreditation. An application by Russia to join the Washington Accord foundered on findings that its form of governance was faulty.

2010

In 2010 ENAAE stabilised, but not without an unexpected delay to acceptance of the UK's approach to accreditation of stand-alone masters degrees. This was resolved in May. A joint survey of professional engineers with VDI[58] and CNISF[59] provided evidence of similarity of roles and salaries for professional engineers working in all three countries. At home, relationships with the Universities UK Europe Unit were developing well.

The IEA carried out two reviews of the Engineering Council under the Sydney and Dublin Accords. Full membership of both Accords was extended for a further 6 years.

In Europe the Recognition of Qualifications Directive was coming up for its five year review and the Engineering Council was heavily involved in responding to various investigations regarding the Directive's effectiveness and need for change.

FEANI appointed a new Director General, Dirk Bochar and Jim Birch announced his own forthcoming retirement from the Engineering Council which became effective in October 2011 at the same time as he ended his term on the FEANI Board (to be succeeded by the new CEO, Jon Prichard). Katy Turff, previously from IET, became the new Head of International Recognition.

[57] House of Commons Innovation, Universities, Science and Skills Committee *Engineering: turning ideas into reality* HC 50-I para 348

[58] Verein Deutscher Ingenieure – the German national association for professional engineers

[59] Conseil National des Ingénieurs et Scientifiques de France – the French national association for professional engineers

Engineering Council/EC[UK] 2002-2010

2001	October	Engineering Council vote to dissolve the Senate and adopt a revised charter
2002	March	New charter granted
	April	First Board Meeting
	October	Registration Standards Committee, Quality Assurance Committee and International Advisory Panel created
2003	January	International Seminar for PEIs
	December	UK-SPEC launched
2004		Investors in People/ISO 9000 registration Accreditation Handbook published Technician Conference
2005		Consolidation of accreditation practice through creation of EAB Engineering Technician database established
2006		QAA adopt UK-SPEC output standards Funding for pilot MSc in Professional Engineering CSCS certification
2007		Move to High Holborn ICT Technician Standard launched Statement of Ethical Principles published
2008		Marketing programme established by EC[UK] Expansion of Professional Affiliate programme Sustainability COP approved for publication Relaunch of UK-SPEC
2009		Fair Access to the Professions Inquiry Select Committee Report on engineering EC[UK] becomes Engineering Council again
2010		Risk COP initiated Marketing begins to show big gains in new registrants Technician Council established

One of the obligations acquired by the Engineering Council on the grant of its charter in 1981 was the requirement to "participate in establishing and regularly updating rigorous standards and criteria" [for] "the selection, education, training and continuing development of all levels of engineers and technicians in the engineering workforce in the United Kingdom". Under the guidance of Prof Jack Levy, Standards and Routes to Registration (SARTOR) was developed. This important document, first published in December 1984, codified for the first time the requirements for registration, bringing together the host of different standards developed over the years by the individual professional engineering institutions. It included a detailed explanation of the routes to registration, explaining the need for initial professional development, and for continuing professional development, and how they might be acquired.

The profession readily adopted the requirements, and aside from a few "wobbles" - largely the result of differing traditions amongst the larger institutions, it became the profession's regulatory "workshop manual" for the 1980's and 1990s. In January 1988 there was one significant revision, which introduced the requirement for a structured interview (termed a professional review) of every applicant for Chartered Engineer or Technician Engineer[60] registration to be conducted by the PEIs.

During the 1990s the "vocational qualifications" movement revolutionised thinking about education and training. Driven with missionary zeal by the National Council for Vocational Qualifications, led by Oscar De Ville, it found much resistance amongst employers and professional bodies, many of whom saw its identification of learning outcomes and process-independent learning as simplistic and irrelevant[61]. With a strong base in craft and a big investment in experiential learning, the engineering profession was one of the first to see value in the concepts of the new movement. As the *Chronicle* describes[62], the Engineering Council supported from 1992 four Occupational Standards Councils: the Construction Industry Standing Conference; Extraction and Process; Engineering Manufacturing; and Engineering Services (Operations). These bodies set about establishing the competence descriptions for practice as a professional engineer or technician.

While the national vocational qualifications generated by the NCVQ went through a series of setbacks[63], such that the qualifications themselves were regarded in many industries with suspicion, the principles gained a life of their own. Learning outcomes have been adopted for most further and higher qualifications in the UK and internationally. Building on these, the concept of competence as a defining characteristic of a professional has become established. The Engineering Council's consultation document *Competence and Commitment,* published in January 1995, invited the profession to consider a proposal to revise the SARTOR standard to identify the components of a professional competence as the only valid measure for becoming recognised as a professional engineer or engineering technician. To the basic idea of competence, the Council's Board for Engineers Regulation added a requirement to demonstrate commitment to professional ethics. The

[60] later known as Incorporated Engineer

[61] See also *Competence-Based Assessment*, Alison Wolf 2001 (http://www.heacademy.ac.uk/assets/documents/resources/heca/heca_cl25.pdf)

[62] Pages 58ff

[63] See for example *A Review of 100 NVQs and SVQs* Gordon Beaumont 1996

positive response of the profession led to development of a third version of SARTOR which became known as SARTOR 3 (or sometimes SARTOR 97). SARTOR 3 was published in September 1997.

If the introduction of competence and commitment had been the only change in SARTOR, it could well have been feted as a historically significant milestone in the development of the professions. However, during the period of its revision, another major change was taking place in higher education. The Further and Higher Education Act 1992 saw the elimination of the "binary divide" allowing Polytechnics to become universities in their own right. At the same time universities were becoming increasingly concerned about the standards of A levels, with regular warnings that the traditional content of mathematics and physics at A level – the bedrock for an undergraduate education in engineering - were being "watered down".

Concerns about this led to the insertion of the requirement for "input standards" as a means to ensure that accredited degrees were taken only by those "intellectually capable" of meeting the standard. This proved to be a most divisive decision, and the standard never gained the support the Engineering Council hoped for. The disquiet contributed significantly to the willingness of the profession to tear down and replace the 1995 Engineering Council constitution almost before the paint was dry.

Incorporated Engineer Title – a Summary Annex C

During the period following the relaunch of the Engineering Council as EC[UK] in 2002, there were a number of initiatives that bore on the understanding of the description, Incorporated Engineer.

An early version of for UK-SPEC envisaged adoption of Chartered Engineering Technologist as a new title for Incorporated Engineers. However the proposal met with widespread opposition from existing Incorporated Engineers, who believed it indicated a watering down of their engineering competence.

A working group was set up by the newly-formed EC[UK] Board which reported in June 2003. Its findings were rejected, as it made no clear recommendations for distinguishing technologist qualifications from engineering ones. The report was revisited in 2005 and a working group set up to resolve the question of whether there was a viable way forward to creating a technologist register. The working group reported in 2006 that no agreement could be reached on the question of whether technologists should have academic qualifications at masters level (the position of the only two chartered engineering institutions who had technologist members), or bachelor level (the view strongly held by other institutions, including incorporated bodies). The latter view also aligned with the international scene, where at least four countries, including Canada and Australia, had IEng-equivalent engineers, but registered them as technologists. The outcome, adopted by the Board in May 2006, was that no action was to be taken for at least 2 years.

However, Professor Banks, a new member of the Board, pressed for a review of the issue of the decline of IEng registration in December of that year. A new working group was set up under the auspices of the Board's Registration Standards Committee. They reported in June 2007, recommending *inter alia* that "the Incorporated Engineer title should be replaced, and market research should be undertaken into the acceptability of Registered Engineer or Registered Professional Engineer" [titles]. Unfortunately the Royal Academy of Engineering immediately made it clear that it would not favour a title which had REng as its post-nominal, since this might be confused with FREng. The group therefore decided to offer a wider range of titles for consideration, although it agreed that Registered Engineer should remain one of the options.

In April 2008 all the professional engineering institutions were asked for their views (and were encouraged to seek the views of their IEng members) on the following five possible titles:

- Engineer Practitioner (EngP)
- Incorporated Engineer (IEng)
- Registered Engineer (REng)
- Chartered Certified Engineer (CCEng)
- Associate Chartered Engineer (ACEng)

The responses showed that the two most favoured titles were Incorporated Engineer and Chartered Certified Engineer, with the latter having a slight majority among IEng registrants. The balance of opinion among the institutions however favoured retention of the current Incorporated Engineer title, and many current registrants had expressed this view very strongly. Many respondents anyway

felt that effective promotion would make more difference to the success of this registration category than any change to the title. The outcome was to retain the status quo.

Marketing IEng

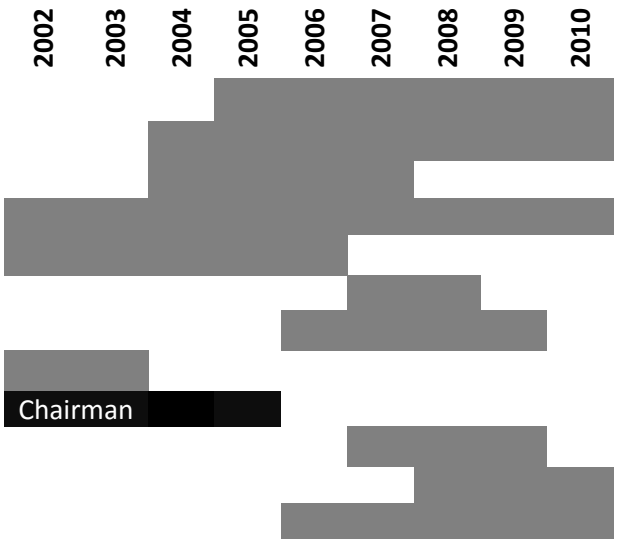
During the period when marketing fell between ETB and EC^{UK}, a significant decline took place in the numbers of registered Incorporated Engineers - from 1997 to 2007 the numbers fell by a quarter. After transfer of responsibility to EC^{UK}, with funding to enable dedicated materials and staff, recruitment of new Incorporated Engineers started to turn round. While 2008 recruitment remained in the doldrums, 2009 showed a 10% increase and 2010 saw 80% more recruits than 2007. At just under 900, this was still much lower than the steady annual 2000-plus seen in the first ten years of the Engineering Council, but significantly better than the average for the ten years ending in 2007. The Society of Operations Engineers was initially the new champion, overtaken in 2010 by the IET.

The future

Discussion with today's employers demonstrates that demand for Incorporated Engineer competence is undimmed – though many employers are still unaware of the title. Globalisation has also had an insidious effect as employers are increasingly called on to demonstrate the competence of key members of their workforce. Finally, the profession itself has worked hard to defuse the internal status issue. More and more institutions encourage senior Incorporated Engineers to seek Fellow registration, while IEng representation on boards and committees is becoming commonplace.

Engineering Council Board 2002 to 2010

		Nominated by
EurIng Isobel	Pollock	IMechE /ETB
Colin	Porter	Group C/IRSE
Jon	Prichard	ICE
Michelle	Richmond	ETB/IET
Dr B A	Rickinson	IoM3
Dr Mike	Rodd	BCS
Paul	Spicer	ETB
Mark	Taylor	ETB
Sir Colin	Terry	RAeS
Stephen	Timms	ETB
Prof Tony	Unsworth	IMechE
Dr Graham	Woodrow	IoM3



PEIs 2002 and 2010

2002	2010
Association of Cost Engineers	
British Computer Society	British Computer Society
British Institute of Non Destructive Testing	British Institute of Non Destructive Testing
	Chartered Institution of Highways and Transportation
Chartered Institution of Building Services Engineers	Chartered Institution of Building Services Engineers
Chartered Institution of Water and the Environmental Management	Chartered Institution of Water and the Environmental Management
	Institute for the Motor Industry
Institute of Acoustics	Institute of Acoustics
Institute of Cast Metals Engineers	Institute of Cast Metals Engineers
Institute of Energy	Energy Institute
Institute of Engineering Designers	Institute of Engineering Designers
Institute of Marine Engineering Science and Technology	Institute of Marine Engineering Science and Technology
Institute of Measurement and Control	Institute of Measurement and Control
Institute of Physics	Institute of Physics
Institute of Physics and Engineering in Medicine	Institute of Physics and Engineering in Medicine
Institute of Plumbing	Chartered Institute of Plumbing and Heating Engineering
Institute of Water Officers	Institute of Water
Institution of Agricultural Engineers	Institution of Agricultural Engineers
Institution of Chemical Engineers	Institution of Chemical Engineers
Institution of Civil Engineers	Institution of Civil Engineers
Institution of Electrical Engineers	Institution of Engineering and Technology
Institution of Fire Engineers	Institution of Fire Engineers
Institution of Gas Engineers and Managers	Institution of Gas Engineers and Managers
Institution of Healthcare Engineering and Estates Management	Institution of Healthcare Engineering and Estates Management
Institution of Highway Incorporated Engineers	Institution of Highway Engineers
Institution of Incorporated Engineers	*(merged with IET)*
Institution of Lighting Engineers	Institution of Lighting Professionals
Institution of Materials, Minerals and Mining	Institution of Materials, Minerals and Mining
Institution of Mechanical Engineers	Institution of Mechanical Engineers
Institution of Nuclear Engineers	Nuclear Institute
Institution of Railway Signal Engineers	Institution of Railway Signal Engineers
	Institution of Royal Engineers
Institution of Structural Engineers	Institution of Structural Engineers
Royal Aeronautical Society	Royal Aeronautical Society
Royal Institution of Naval Architects	Royal Institution of Naval Architects
Society of Environmental Engineers	Society of Environmental Engineers
Society of Operations Engineers	Society of Operations Engineers
The Welding Institute	The Welding Institute

List of Acronyms

ABET	Accreditation Board for Engineering and Technology (for the USA)
APEC	Forum for Asia-Pacific Economic Co-operation
BCS	British Computing Society
CEng	Chartered Engineer
CIBSE	Chartered Institution of Building Services Engineers
CNISF	Conseil National des Ingénieurs et Scientifiques de France – the French national association for professional engineers
CPD	Continuing professional development
CSCS	Construction Skills Certification Scheme
DABCE	Degree Accreditation Board for Chartered Engineer
DIUS	Department of Innovation Universities and Skills
DTI	Department of Trade and Industry
EAB	Engineering Accreditation Board
ECEI	ABET's international engineering credentials evaluation programme
EEF	Engineering Employers Federation (later called Manufacturers' association for UK manufacturers)
EngTech	Engineering Technician
EMC	FEANI's European Monitoring Committee
EMF	Engineers Mobility Forum (of International Engineering Agreements)
EPC	Engineering Professors' Council
ENAEE	European Network for Accreditation of Engineering Education
ESOEPE	European Standing Observatory for the Engineering Profession and Education
ETB	Engineering and Technology Board
EurACE	European Network for Accreditation of Engineering Education
EurEta	European association for engineering technicians
FEANI	European Federation of National Engineering Associations
HEFCE	Higher Education Funding Council for England

IAM	International Agreements Meeting (subsequently IEA)
IAP	Engineering Council's International Advisory Panel
ICE	Institution of Civil Engineers
IChemE	Institution of Chemical Engineers
IEA	International Agreements Alliance
IED	Institution of Engineering Designers
IEE	Institution of Electrical Engineers
IEng	Incorporated Engineer
IET	Institution of Engineering and Technology
IHEEM	Institution of Healthcare Engineering and Estates Management
IHIE	Institution of Highway Incorporated Engineers
IIE	Institution of Incorporated Engineers
IMarEST	Institution of Marine Engineering Science and Technology
IMechE	Institution of Mechanical Engineers
IntPE	International Professional Engineer (registered by the EMF)
IoEE	Institution of Environment Engineers
IoM3	Institution of Materials, Minerals and Mining
IoP	Institute of Physics
IRSE	Institution of Railway Signal Engineers
IStructE	Institution of Structural Engineers
JBM	Joint Board of Moderators
MEng	Master of Engineering (integrated) degree
PE	State-registered professional engineer (USA)
PEI	Professional Engineering Institution
QAA	Quality Assurance Agency (for Higher Education)
RAeS	Royal Aeronautical Society
RSC	Registration Standards Committee

SARTOR	Standards and Routes to Registration
SARTOR 3	SARTOR version3, published in September 1997
SOE	Society of Operations Engineers
UK NARIC	National Recognition Information Centre for the United Kingdom
UK-SPEC	UK Standards for Professional Engineering Competence
VDI	Verein Deutscher Ingenieure – the German national association for professional engineers
WFEO	World Federation of Engineering Organisations

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Acknowledgements

Particular thanks are due to the current staff of the Engineering Council, especially Jon Prichard and Sue Ainsworth for the provision of past files and reference material, to Sue Brough for help and advice, and to Siva Sivarajah for enabling me to unpack 37,000 emails stored away for just such an eventuality.

I should also like to acknowledge the editing and suggestions made by Professor Kel Fidler, Dr Jim Birch and Richard Shearman.

Special mention must be made of the effort made by Dr Robert Hawley to provide much useful background, together with access to his files from the time of the Hawley Review. The library of the Institution of Engineering and Technology also provided help and advice.

And finally I am grateful for the patience and forbearance of Mrs Ruth Ramsay, who not only assisted with the final revisions, but pretended she hadn't noticed the large amounts of boxes and files that took up residence at home during the research for the review.

Andrew Ramsay, May 2012