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Academy fronts engineering push at political conferences

The next general election must be held on or before Thursday 3 June 2010. So this year will be the last political party conference season before the next general election and, many commentators believe, possibly the most significant in more than a decade.

At the next election, the Labour Party will be looking to secure a fourth consecutive term in office and to restore lost support. The Conservative Party will seek to regain its dominant position in politics and replace Labour as the governing party. The Liberal Democrats will hope to make gains from both sides, ideally wishing to form a government, but with a more realistic ambition to hold the balance of power in a hung Parliament.

For the party hierarchy and leadership, party conferences are a platform to outline their vision, test out policy initiatives and to promote their individual standing within the party. For organisations wishing to make their mark in policy debate, the conference fringe programmes provide an opportunity to engage with political heavyweights and conference delegates alike.

Under the banner of *Engineering the future*, the professional engineering community has been working together to raise the profile of engineering and promote the contribution of engineering to the UK's economic recovery. Working alongside Reform, an independent think tank, a lineup of fringe events at all three conferences has been organised on the theme *Picking Winners: can engineering succeed where finance failed?*

Each event will include a front-bench spokesperson and an engineering leader. In debate with Dr Vince Cable MP at the Liberal Democrats will be Professor Dame Wendy Hall FEng of University of Southampton; Science and Innovation Minister Lord Drayson will debate with Jonathan Flint, CEO of Oxford Instruments at the Labour Conference and Kenneth Clarke QC MP, Shadow Secretary of State for Business, Enterprise and Regulatory Reform will be joined by David Waboso FEng, Director of Line Upgrades at London Underground. Young women engineers will also speak at each event.

The engineering community's representation at the party conferences aims to ensure that engineering has a strong presence throughout the conference season and that the profession's messages are communicated in a coherent and compelling way.

Liberal Democrats

Speakers: Professor Dame Wendy Hall FEng, University of Southampton; Dr Vincent Cable MP, Shadow Chancellor of the Exchequer; Liza Brooks, co-founder, True Snowboards

Date: Tuesday 22 September, 1.00pm

Labour

Speakers: The Rt Hon Lord Drayson, Minister for Science and Innovation; Jonathan Flint, CEO Oxford Instruments; Dr Hanna Sykulska, IET Young Woman Engineer of Year Award

Date: Wednesday 30 September, 1.00pm-2.00pm

Conservatives

Speakers: David Waboso FEng, Director of Line Upgrades, London Underground; Rt Hon Kenneth Clarke QC MP, Shadow Secretary of State for Business, Enterprise and Regulatory Reform; Dr Rachel Cooke, Process Development Manager Cadbury

Date: Wednesday 7 October, 11.00am-12.00pm

Dame Wendy Hall FEng, David Waboso FEng, and Jonathan Flint will all be giving talks on engineering at each of the main political parties' conferences.



PRESIDENT'S COLUMN



The President answers questions at the Academy's 2009 Annual General Meeting

The following is an extract from the President's address to the Academy's Annual General Meeting in July 2009

This year sees the 40th anniversary of the first astronauts landing on the moon. Without engineering, the Apollo programme would never have happened and our world today would be very different. It is engineering that creates and maintains our modern lifestyle. And it is engineering that must solve today's most important challenges: to make our way of life sustainable and spread the benefits of progress fairly for all of humanity to enjoy.

Tackling these great challenges calls for bold political decision-making. We need policy that enables workable solutions to come forward in an achievable timeframe. In other words, national policy must be designed alongside a roadmap for its delivery. This is why engineers – and their approach to problem-solving and complex project delivery – need to be at the heart of policymaking.

This was very much the view of the House of Commons Innovation, Universities, Science and Skills (IUSS) Select Committee, which published a major report on engineering in March 2009. *Engineering: turning ideas into reality* called on the Government to strengthen policy by employing more engineers in the civil service and enlisting the right level of external engineering expertise. The report recommended that Government should secure that expertise through the Academy. The Academy's role should be to

focus and coordinate the contribution of the professional engineering community.

The Committee's view chimed with work that the Academy had already begun with partners across the professional engineering community. We have been seeking to improve the engagement of engineering with key areas of policymaking. This is starting to bear fruit. We are now formalising and developing this role, working with the Government Chief Scientist and the network of Chief Scientific Advisers and with Government departments.

The global downturn has focused on the need to retool the UK economy into a science-based, high-value set of industries. The Academy, together with Government, has devised *Engineering the future* as a banner under which we are addressing key national challenges. Together, we are also promoting public dialogue and debate about the engineering contribution to the economy and society at large.

It has been a busy and successful – yet challenging – year. In October 2008, we celebrated our first anniversary in this splendid building at Carlton House Terrace. Our move here was made possible by the generosity of our Fellows and I wish to offer them my sincere thanks.

Relocating here has made possible so many good, new developments. But the most remarkable progress has been the impact of our new building on our role as a leadership body within engineering

itself. The location and the space have meant we can bring together and work with engineers from across the UK and the world.

The Academy is an ambitious organisation, underpinned by good governance and sound business practices. We are committed to planning, evaluating and reviewing our work programme so that we work efficiently as well as effectively. None of our successes would, however, be possible without three groups of important people. Firstly, our Fellows, who give so selflessly of their time and world-class expertise to lead our work. Secondly, our supporters and sponsors, whose generosity allows us to do so much excellent work. And, last but not least, our staff, whose dedication and professionalism are a credit to us.

Thank you all for your contribution to the life of our Academy.

Meetings and visitors

The President recently met:

The Rt Hon the Lord Drayson of Kensington Minister for Science and Innovation, Department for Business, Innovation and Skills

Dr John Holdren Assistant to the President for Science and Technology and Director of the Office of Science and Technology Policy (Executive Office of the President of the United States)

Lord Rees of Ludlow OM Kt PRS President, The Royal Society

Phil Willis MP Chair, House of Commons Select Committee on Innovation, Universities, Science and Skills

DEVELOPMENT

Shell backs Academy programmes

The Academy has announced a new partnership with Shell that will help support two key programmes. As part of the Academy's *Making Things Better* campaign, Shell will support the Engineering Leadership Advanced Awards and the Visiting Teaching Fellowships.

Shell's support of the Engineering Leadership Advanced Awards will enable these highly regarded awards to be expanded and for the first time be open to the very best international engineering undergraduates studying in the UK, as well as UK nationals.

In addition, Shell will be helping to enhance the engineering undergraduate curriculum through the advancement of the Visiting Teaching Fellowships. The 10 young industrial engineers to be funded by Shell over a two-year period will share their cutting-edge, industrial knowledge as well as offering inspiration as role models and practical careers advice.

It is through the support of leading companies such as Shell that the Academy can fulfill its crucial aim of increasing the number of engineering graduates pursuing careers in industry.

Academy announces Petrofac Fellowships



September 2009: Petrofac Group CEO Ayman Asfari (centre right) and Eur Ing Bob Siddall FREng (centre left) presented the first four awards in a prestigious £250,000 programme of Fellowships with the Academy. Each of the new Petrofac/Academy Fellows (from left to right: Fidelis Mugabe, Liesel Detemple, Lizzy Motshowene, and Elaine Donegan) received a £6,000 award, with a further £3,000 to be awarded on completion of the Fellowships.

Fellows visit to leading research facility

Academy Fellows visited one of the UK's leading science and research facilities, the National Physical Laboratory (NPL), in June 2009.

The NPL is the UK's National Measurement Institute, maintaining and developing the nation's primary measurement standards. It is also a world-leading centre of excellence, established over a century ago to research and apply scientific discoveries for the benefit of the nation.

The NPL's research covers dozens of different engineering and scientific fields, from acoustics to quantum mechanics and biochemicals. Fellows were given tours of several NPL laboratories to see the institution's cutting-edge research in action.

This included a look at the Nanoscale Dimensional Measurements lab, where the NPL is improving on technology it previously developed to measure dimensions below a single nanometre.

Annual General Meeting 2009

The 33rd Annual General Meeting (AGM) of the Academy was held in July 2009 at Carlton House Terrace. The meeting was chaired by the President, Lord Browne, and 74 Fellows were present.

The President gave a review of the year which covered the main developments, focusing in particular on policy, international, and education initiatives. The President also explained the Academy's ambition to make 3 Carlton House Terrace the forum for UK engineering and a showcase for the brightest and best engineering talents.

Three International Fellows, 38 Fellows and four Honorary Fellows were elected and the Annual Review and the Financial Report and Accounts for the year ended 31 March 2009 were adopted.

The AGM elected the following new Officers to Council: Professor Sir William Wakeham (Vice President and Chair, International Committee), Professor Martin Earwicker (Vice President and Chair, External Affairs Committee), and Dr Michael Howse (Honorary Treasurer and Chair, Finance and Audit Committee).

The AGM noted that the following five Fellows had been elected to Council by postal ballot: Richard Parker, Paul Westbury, Professor David Delpy, Professor Brian Cantor and Ian Ritchie.

Following the formal business of the AGM, Fellows were able to hear technical presentations from three participants in Academy schemes. They were: John Armstrong (former Engineering Leadership Award holder), Dr Mark Ryan of the University of Birmingham (a participant in the Industrial Secondment Scheme), and Dr Karla Miller of the University of Oxford (RAEng/EPSCRC Research Fellow).

RESEARCH

Chair in future rail research

Professor John Andrews has been appointed Research Chair in Infrastructure Asset Management, jointly sponsored by the Academy and Network Rail, within the University of Nottingham's Transportation Engineering Centre.

Infrastructure asset management is a new and rapidly developing engineering discipline that provides a framework for optimising and implementing major decisions on the operation, maintenance, renewal and enhancement of physical assets for the delivery of safe and economic infrastructure.

The focus of the Research Chair will be to improve this framework and ultimately will affect decisions which drive tens of billions of pounds of engineering expenditure each year in the UK and have a significant impact on outputs of national significance.

Professor Andrews has considerable expertise in system reliability, involving the modelling of complex systems with multiple components to predict performance, maintenance modelling, fault diagnostics and system optimisation.

The initial investment from Network Rail and the Academy is in excess of £1.4 million, with the University of Nottingham committing itself to extra academic staff to complement the new professorial post.



Network Rail is a co-sponsor of the new Research Chair in Infrastructure Asset Management

Research towards virtual engine modelling

A new Academy-backed Senior Research Fellowship in Computational Engineering has been awarded to Dr Nicholas Hills at the University of Surrey.

The Royal Academy of Engineering/Rolls-Royce Senior Research Fellowship is fully funded for five years, with the programme focused on the full simulation of a gas turbine engine using massively parallel computation and high fidelity fluid flow modelling.

Dr Hills brings a unique set of skills to the research programme with his extensive experience in computational fluid dynamics, computing and numerical

methods, the design of large computing systems and an understanding of turbomachinery.

The Senior Research Fellowship will be held within the Fluid Research Centre at the University of Surrey, which was established in 2000 as a hub for research in mechanics, dynamics and physics of fluids. Dr Hills will expand the centre's research into massively parallel computer modelling in turbomachinery and strengthen important links between Rolls-Royce and Surrey through their Thermo-Fluid Systems University Technology Centre under the direction of Professor John Chew.

Liquid steel processing

The first jointly sponsored Senior Research Fellowship between the Academy and steel manufacturer Corus has been awarded to Dr Rongshan Qin in the field of liquid steel processing and chemical metallurgy at Imperial College London.

The Senior Research Fellowship will see Dr Qin become a member of the Department of Materials to bring expertise in the development of novel processes for the production and casting of ferrous alloys. His research will focus on process development via experimentation with state of the art high performance computing and visualisation techniques.

Dr Qin previously held a Professorship in computational metallurgy at Pohang University's Graduate Institute of Ferrous Technology in South Korea.

The fully funded five-year Senior Research Fellowship will allow Dr Qin to build a world-class research team that will address key challenges such as sustainable metal manufacture and maintaining steel quality.

Chemring award

The Academy is pleased to announce the launch of a new Industrial Secondment as a result of the generosity of Chemring Group Plc.

Chemring is a global group of companies providing unique solutions to the defence, security and safety markets. The Chemring Industrial Secondment award provides an opportunity for an outstanding engineering academic to work at Chemring Defence UK Ltd for six months on a full-time or for longer on a part-time basis. They will take part in a project to review and improve the way powders and granulated compositions are processed and handled.

Funding will be provided to the secondee's university for the employment of a temporary replacement. The secondee's travel and subsistence expenses will also be met. The deadline for applications is 30 September 2009. For further information visit

www.raeng.org.uk/research/univ/secondment/chemring

INTERNATIONAL

Former oil chief gives ERA Lecture

The 2009 ERA International Lecture was delivered by Abdallah S Jum'ah, former CEO and President of Saudi Aramco, the Saudi Arabian national oil company, in June 2009 in London.

The lecture, *Technology: the key to the future of sustainable energy*, provided an opportunity to hear a top-level oil industry representative talk about the global energy challenge.

With his unique perspective of the oil



Abdallah Jum'ah gives the 2009 ERA lecture

industry over five decades, Abdallah Jum'ah gave his opinions on the future of oil production, placed in the context of concerns over the environmental impact of fossil fuels, and highlighted the increasing importance of engineering to meet these challenges.

During the Q&A session, chaired by President Lord Browne, Abdallah Jum'ah spoke of the lead which Saudi Arabia was taking to educate the next generation of engineers vital for the continuing prosperity of the country and the increased investment being made in alternative energy sources. Jum'ah was appointed by King Abdullah in December 2007 to serve on the supreme committee of the King Abdulaziz City for Science and Technology, which oversees promoting and supporting applied scientific research to foster the Kingdom's ongoing economic and social advancement.

The International Lecture was created following a generous donation from the ERA Foundation to enable a UK audience to hear an international perspective from an eminent person with broad engineering interests.

A video and full transcript of the lecture are available at www.raeng.tv

CAETS in Calgary

The Academy played a prominent role in the 18th convocation of the Council of Academies of Engineering and Technical Sciences (CAETS), which was held in July 2009 in Calgary, Canada. The theme for this year's convocation was Global Natural Resources.

John Baxter FEng co-chaired the opening session and delivered a keynote address entitled *Energy for Life: what can national academies do?* Professor Howard Wheeler FEng co-chaired the Water Management session and gave an address on *Water Management for a Changing Climate: challenges and opportunities*.

International Secretary Peter Saraga CBE FEng signed a Memorandum of Understanding with Dr P S Goel, President of the Indian National Academy of Engineering, which will provide a structure for future cooperation between both Academies.



Peter Saraga (left) and Dr P S Goel

New set of 2009 Newton International Fellowships announced

A new group of researchers from around the world have been chosen to work with top UK institutions in the second round of Newton International Fellowships.

The Newton International Fellowships, administered by The Royal Academy of Engineering, the Royal Society and the British Academy, aim to encourage potential research high-fliers of the future from around the world to build new global research collaborations with UK groups. Further follow-on funding is available to enable the Fellows to maintain their links with the UK.

One of the second wave of 13 engineers to be awarded a prestigious Newton International Fellowship is Amos

Madhlopa from Malawi. He will be spending two years at the University of Strathclyde developing a computational model of solar distribution in a double slope solar still for water desalination.

Access to clean water is limited, especially in remote areas of Malawi. The major source of fuel is wood, which is contributing to deforestation and other environmental problems. The sustainable provision of clean water based on a renewable energy source is an essential problem to solve.

It is expected that the developed solar still will be exploited in remote areas. At present, desalination is only attempted in urban areas using conventional sources

of energy. This work will ensure that the technology is accessible in rural areas and by those with no access to conventional energy access. The solar still requires simple skills and materials to fabricate. The technology should be easy to exploit among communities in rural areas of Malawi and other developing countries to increase the supply of clean water.

The full list of Fellowships awarded is available at

www.raeng.org.uk/international

The next round of the scheme will open on 14 December 2009. Further information is available at

www.newtonfellowships.org

AWARDS

Awards nominations

The following Awards are now open for nominations:

Prince Philip Medal

Awarded biennially to an engineer of any nationality who has made an exceptional contribution to engineering through practice, management or education.

www.raeng.org.uk/prizes/philip

Sir Frank Whittle Medal

Awarded to an engineer, normally resident in the UK, for outstanding and sustained achievement which has contributed to the well-being of the nation. This year's theme is *Engineering Innovations in International Development*.

www.raeng.org.uk/prizes/whittle

Silver Medals

Recognise individuals who have demonstrated an outstanding contribution to British engineering, which has resulted in market success.

www.raeng.org.uk/prizes/silver

Closing date: Friday 6 November 2009

For more information, including how to apply online, please email awards@raeng.org.uk

President's Medal for ERA chairman

The 2009 President's Medal, awarded to an engineer of considerable distinction, was presented by Lord Browne of Madingley to Sir Alan Rudge CBE FREng, founding chairman of the Engineering and Physical Sciences Research Council and current chairman of the ERA Foundation.

As founding Chairman of the EPSRC from 1994 until 1999, Sir Alan Rudge put in place fundamental changes in the way a research council operates that are still in place today. He has consistently championed creative partnerships between academic researchers and industrial researchers, believing that any research problem identified by industry can be as intellectually rewarding and challenging as any 'blue skies' research.

Sir Alan's vision also brought about the creation of the ERA Foundation as it is known today. The Foundation seeks to contribute to the UK economy by successful commercial exploitation of research and has provided substantial support for the aims and work of the Academy. In 2004 it gifted £8 million to the Academy to fund new initiatives to inspire young engineers at formative stages in their careers.



Sir Alan Rudge and President Lord Browne

Mountain bike innovator wins top ERA prize



Dr Batterbee and his innovative bike

Dr David Batterbee has received the Academy's ERA Foundation Entrepreneurs Award 2009, for an innovative device which can detect differences in terrain for mountain bikes.

Most mountain bikes have a shock absorber system in place to absorb the impact of bumps and keep the rider in control, which has to be manually adapted to suit the terrain.

Dr Batterbee, from the University of Sheffield's Department of Mechanical Engineering, has developed a rear shock absorber that electronically monitors the severity of the terrain and then optimises the bike's performance automatically.

The ERA Foundation Entrepreneurs Award looks to recognise the collaboration of research with entrepreneurial promise in the field of electrotechnology.

The award and £40,000 cash prize is made possible by the support of the ERA Foundation.

The call for submissions for the 2010 awards is now open. The deadline for submissions is 23 October 2009. For more information visit

www.raeng.org.uk/prizes/era

International Medal

Dr Abdul Kalam, former President of India, was awarded the Academy's International Medal by Lord Browne at the Academy Awards dinner held at the Imperial War Museum in June 2009.

From his role in the creation of the Indian space industry to his term of office as President of India (from 2002 to 2007) Dr Kalam has achieved distinction as both an engineering pioneer and a public advocate of science and engineering. His achievements include the launch of India's first satellite and the successful management of India's missile programme. His lectures and bestselling books promote the potential of technology to bring development and prosperity to the population of India.

The International Medal is awarded occasionally to an individual resident outside the European Union for outstanding and sustained achievement in the broad field of engineering.

EVENTS

Awards round-up

Several other awards were recently presented by the Academy.

The **Public Promotion of Engineering Award** was presented to the Cardiff-based project *Engineering Explained*. The project takes shows on tour to inspire young people about engineering as a career choice and highlight the impact engineering has on our daily lives.

The project was spun-out of the award-winning *Science Made Simple*, an organisation founded by physicist Wendy Sadler to inspire young people aged seven to 16 about science and engineering.

The *Engineering Explained* shows have reached over 17,500 people in the UK and recently toured Libya at the invitation of the British Council.

The **Sir George Macfarlane Award** was presented to biomedical engineer Dr Silvia Schievano for her pioneering development of patient-specific heart valves that do not require surgery to implant.

Dr Schievano is part of a team led by Professor Philipp Bonhoeffer, who first devised the technique in 2000. She has used engineering techniques such as rapid prototyping to allow the manufacture of heart valves for individual patients.

Dr Schievano is the Academy/EPSRC Research Fellow at the UCL Institute of Child Health. The Sir George Macfarlane Award is given to an individual who has demonstrated engineering excellence at an early stage of their career.

Other awards include the Academy Silver Medals (covered in the September 2009 issue of *Ingenia* magazine) and the Independent-Bosch Technology Horizons Award (see page 10).



Award winner Dr Silvia Schievano

Autumn 2009

30 September 2009, 10.00am

Engineering Research Forum

Annual showcase of Academy sponsored research

Chair: Professor John Perkins CBE FREng

Venue: The Royal College of Physicians, 11 St Andrews Place, Regent's Park, London NW1

Contact: rob.barrett@raeng.org.uk

19 October 2009, 5.00pm

Hinton Lecture and Dinner

Speaker: The Rt Hon Lord Mandelson

Chair: Academy President, Lord Browne of Madingley

Venue: Royal Society of Medicine, 1 Wimpole St, London W14

Contact: helen.berrington@raeng.org.uk

20 October 2009, 1.45pm

UK Focus for Biomedical Engineering

Regenerative Medicine: the engineering interface (briefing seminar)

Venue: 3 Carlton House Terrace, London SW1Y 5DG

Contact: alice.curnow@raeng.org.uk

9 November 2009

New Fellows' Briefing (Invitation only)

Venue: 3 Carlton House Terrace, London SW1Y 5DG

Contact: faye.whitnall@raeng.org.uk

9 November 2009, 7.00pm

New Fellows' Dinner

(In the presence of the Senior Fellow, HRH The Duke of Edinburgh)

Venue: Drapers' Hall, London EC2

Contact: faye.whitnall@raeng.org.uk

The events and dates listed are accurate at the time of printing. Other events may be sometimes be announced at short notice. Please check the Academy website for the most up to date information: www.raeng.org.uk/events

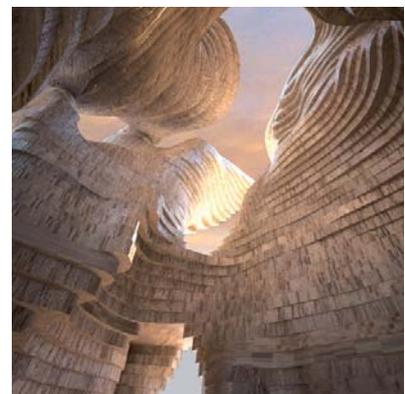
Festivals showcase engineering

The Academy sponsored an unusual international event on London's Southbank from 4 to 6 September 2009: 'Pestival' is an inter-disciplinary festival that celebrates how insects and humans shape the world, in both science and the arts.

The Academy supported Pestival's Termite Pavilion and a series of live events, which brought civil engineering and construction to new public audiences in a creative and engaging way. The Termite Pavilion was a spectacular walk-in structure inspired by the organic forms surrounding the central chimney of a Namibian termite mound.

The structure was designed to give a direct insight into the extraordinary architectural and engineering skills of some of Earth's oldest master builders, termites, which are able to regulate ventilation and temperature without mechanical services.

There were also talks and debates where the public could discover how engineers and architects are changing modern



The inside of the Pestival Termite Pavilion

construction methods by using what they have learned from creatures like termites.

The British Science Festival also took place in September 2009 at the University of Surrey. The Academy supported a number of events, including the Isambard Kingdom Brunel Lecture, which will be given this year by Dr Kerry Kirwan from the University of Warwick.

For more information visit www.britishtscienceassociation.org and www.pestival.org

POLICY AND PUBLIC AFFAIRS

Autonomous systems in the UK

What would happen if an unmanned, driverless truck killed a pedestrian? Who would be to blame and how would the case fit into the UK legal system? Would there be public outcry? The Academy published a discussion document, *Autonomous Systems: social, legal and ethical issues*, to explore these kinds of questions. The document was the outcome of a roundtable discussion with experts from a number of relevant fields, including road and rail transport, surgery, care of the elderly, financial systems, defence, aerospace, and computer science.

The report looked at two areas where autonomous systems are likely to become part of daily life. One such area was transport, with the participants estimating that driverless HGVs are likely to be on the roads in 10 years' time. The view of participants was that such vehicles would be a lot safer than those with human drivers and would likely be more fuel-efficient. However, as accidents can never be ruled out, there is a need to establish how such vehicles would fit into current legal frameworks.

Another significant area is the care of older people and the housebound, with 'smart homes' that monitor peoples' movements. Such specially equipped homes could tell when an inhabitant was unwell and call for aid, as well as monitoring their intake of food and medicine. Although such homes can give people independence and autonomy, they could lead to isolation if friends and neighbours no longer checked on their inhabitants.



Driverless transport is being used at Heathrow

These issues are explored in the report which was discussed in articles published by the *Daily Mail*, *The Guardian*, *The Daily Telegraph*, BBC online, *The Engineer* and several newspapers around the world. The report can be read online www.raeng.org.uk/autonomoussystemes

www.raeng.org.uk/autonomoussystemes

Engineering Values in IT

IT systems form the foundation of many products, services and systems that are crucial to our lives. In July 2009, the Academy produced a report, *Engineering Values in IT*, which set out how engineering skills and methods are essential to ensure that IT systems are robust and reliable.

From the financial systems that process the payment of salaries into bank accounts, to the communications infrastructure and the technologies used in health care, IT systems underpin critical systems that cannot be allowed to fail. However, failures of large and complex IT systems do occur. The report argues that the rigorous systems approach of an engineer is key to developing critical IT systems and that developers of such systems must ensure they have a good grounding in the science underpinning their discipline as well as the latest developments in the technologies they work with.

The report calls for IT professionals to become Chartered Engineers or Chartered IT Professionals to demonstrate and develop their commitment to professional and ethical standards and to their technical competency. It also argues that further qualifications may need to be developed for those working on the most critical IT systems.

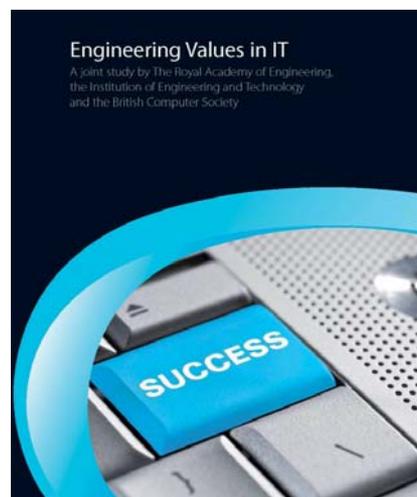
The issues in the report caught the attention of a number of specialist IT publications and technology journalists, gaining a good deal of media coverage. The report is available at www.raeng.org.uk/engineeringIT

Policy responses

The policy team responded to a number of Government and Parliamentary Committee consultations over the summer. These included a response to the Department of Energy and Climate Change (DECC), South West RDA and the Welsh Assembly Government on the first phase of the Severn Tidal Power consultation and a submission on the definition of the term 'carbon neutral' and recommendations for good practice.

There has also been an increasing number of responses submitted jointly with other engineering institutions such as the recent response to the DECC framework for the development of clean coal. This involved the Energy Institute, the Institution of Chemical Engineers, Institution of Civil Engineers, the Institution of Engineering and Technology and the Institution of Mechanical Engineers. It is hoped this trend will continue and provide a stronger voice for engineering within Government.

For a full list of responses, visit www.raeng.org.uk/societygov/policy/responses



Exhibition launched in Westminster

In July 2009, the Academy helped mount an exhibition in the Palace of Westminster. Sponsored by Linda Gilroy, MP for Plymouth Sutton, the week-long exhibition celebrated the quality of UK engineering innovation and highlighted the contribution of engineering to society.

The exhibition was opened by Mr Phil Willis MP, Chairman of the Science and Technology Select Committee, and Sir Anthony Cleaver, Chairman of the Engineering and Technology Board. Both speakers underlined the need for the engineering community to work more closely with Government to help strengthen national policy and promote the contribution of engineering to the UK's economic recovery and beyond. The Rt Hon Lord Drayson, Minister of State for Science and Innovation, also attended the exhibition.

A number of young engineers were present throughout the week to help promote the messages of the exhibition to MPs, Peers and their visitors. Among the items on display were the world's first commercially available bionic hand which introduced a step change in prosthetic engineering; images of Arup's Water Cube in Beijing, described as one of the most visionary buildings ever constructed, and action footage from the world's first zero-carbon, zero-emission motorcycle race.

The exhibition was produced under the banner *Engineering the future*, a collaboration of organisations from the professional engineering community.



Phil Willis MP introduces the *Engineering the future* exhibition at the Palace of Westminster

Academy Fellows consulted on defence review

At a time of ever-increasing demands being placed on limited Ministry of Defence (MoD) resources, the Defence R&D Board, chaired by Professor Mark Welland FREng, has commissioned an independent review of the coherence of its R&D. As part of the task, the review team have also been asked to consult widely and, accordingly, evidence has been taken from both inside and outside of MoD.

Two of the three independent members of the review team are Academy Fellows. Recognising that The Royal Academy of Engineering Fellowship possesses unique insight into dealing with and

understanding the issues, an invitation-only workshop was held at the Academy on 31 July 2009. Even though the notice given was unavoidably short, nine Fellows participated. They provided what the MoD internal team described as invaluable and incisive input. Others unable to attend also offered to help and their evidence will be captured either through one-to-one meetings, or through written submissions.

The output from this review will be taken by the MoD later this year. The contribution from the Academy through its Fellows has been a valued input to this important review.

Electric vehicles study

The Academy has begun a short study on electric vehicles with a scoping workshop held on 29 July 2009, under the chairmanship of Professor Roger Kemp FREng.

While there have been many studies on electric vehicles, very few have taken a holistic view of what would be required for the UK economy to support a fleet of electric vehicles the same size as the current fleet of internal combustion vehicles. Parallel work within the Academy has pointed to the fact that an 80% reduction in CO₂ emissions, under scenarios currently being developed, requires a radical reappraisal of transport energy provision. These are likely to be a serious option moving forward to 2050.

Ideally, electric vehicles should be run on supplies of low-carbon electricity but it is unlikely the UK will have adequate provision of renewable energy for many years to come. The study needs to identify the conditions under which electric vehicles would make a significant contribution to the UK's carbon reduction targets.

If you have an interest or expertise in electric vehicles and would like to contribute to the study, please contact Richard Ploszek, Senior Policy Advisor.

Media coverage

The *Financial Times* featured an interview with the President based on his address to the AGM. Focusing on his comments about Government intervention being required to force the pace on meeting UK emissions targets, it was also picked up by *The Daily Telegraph*.

In May 2009, the Academy published its technical report on synthetic biology. In June, the Academy published the world's first public engagement study on this area, which received widespread media interest. The study of the lead group, led by Professor Richard Kitney FREng, featured in a BBC Radio 4 documentary in the *Frontiers* series, including a discussion recorded at the Academy. Professor Paul Freemont took part in *The Guardian's* weekly science podcast to explain 'the rise of the biological machines'.

EDUCATION

Technology Horizons Award 2009



The 19-24 age group winner, runners-up, and judges at the 2009 Independent-Bosch awards

The winners of the Independent-Bosch Technology Horizons Award 2009 were announced in July 2009. The competition, which the Academy has sponsored and co-organised for five years, challenged participants to write an essay to answer the question: *How can technology and engineering provide innovative solutions to today's global challenges?*

It attracted a record number of entries and the 14 finalists were present at the event, which took place at Carlton House Terrace, along with teachers and parents. Some of the judges were also present, including well-known personalities from the world of engineering and technology, such as TV presenters Johnny Ball and Kate Bellingham, and *The Independent's* science correspondent, Steve Connor.

Winner of the top prize of £700 in the 14-18 year category was Leon Zhang (15) of Urmston Grammar School, Manchester. Gavin Harper from the University of Cardiff scooped the £1,000 top prize in the 19-24 age group. Both winning essays were published in *The Independent* newspaper.

As well as receiving their prizes, the students and their guests were given a presentation by Andy Green, pilot for the Bloodhound Super Sonic Car project. The project, which is led by former land speed record holder Richard Noble, aims to inspire young engineers by creating a car capable of travelling at 1,000 mph.

Academy award scheme expanded

For the first time ever the Academy has been able to extend its Engineering Leadership Award Scheme to include non-UK students, thanks to the generosity of Shell.

The scheme was created to help undergraduate engineering students maximise their potential and achieve their goals and comprises two types of award: the Standard Award and the Advanced Award.

The Standard Award enables students to take short courses to enhance their engineering knowledge and personal skills, and the Advanced Award enables them to carry out a personal development plan over three years under the guidance of a mentor.

This year, non-UK students may apply for the Advanced Award as well as UK students.

Participants of the scheme are those undergraduates who expect to fast-track their career to reach a position of project or team leadership within five years of graduating and be a role model for future generations of engineers and applicants undergo a rigorous selection process.

For more information visit

www.raeng.org.uk/education/undergrad

Academy and E4E aim to improve engineering education

Education for Engineering (E4E), the Academy-hosted body that was set up to offer coordinated and clear advice on engineering education to the UK Government and devolved national assemblies, has expressed concern at the current state of engineering further education (FE) in the UK.

Many engineering employees come from the FE sector and are employed at technician level but, while the Government is addressing the shortfall of engineering graduates, the supporting technical workforce is being overlooked.

According to figures supplied by

the DCSF-DIUS STEM Board, there are currently 6,700 FE teachers of engineering, technology and manufacturing compared to 7,500 in 2003 – a drop of more than 10%. In addition, a much-needed programme to regenerate FE college campuses collapsed in 2008, leaving many colleges still in need of upgrade work to modernise buildings and make them fit for purpose. A Learning and Skills Improvement Service (LSIS) programme to support the ongoing development of engineering teachers has had its funding cut by half in 2009.

In response, the E4E operational group

has outlined suggestions for improved monitoring of the situation.

The Academy is also liaising with the LSIS STEM Programme to deliver continuing professional development (CPD) to teachers of the Level 3 Diploma in Engineering. The programme, which is led by the Academy in close association with Middlesex University Teaching Resources and the National STEM Centre, will deliver high-quality Technology Enhancement Project resources to ensure that Diploma teachers have state of the art teaching and learning technologies at their disposal. It will run until 2012.

Students discover a world underground



Participants in the Tube Lines-LEP engineering event at London South Bank University

Science, technology, engineering and mathematics (STEM) ambassadors from Tube Lines attended an event for London Engineering Project (LEP) students in June 2009 at London South Bank University to help promote engineering as a career choice for young people.

The event was coordinated by the LEP in partnership with Tube Lines, and focused on an activity in which teams of three or four students, aged between 12 and 15, are given a brief to design and build either a station, a train or a section of track and tunnel. They are given the project specifications and a budget, and are up against the clock to deliver.

Like the engineers at Tube Lines, the students had to carefully factor in station accessibility issues and think about where best to position assets such as seating, lighting and ticket offices as well as security features such as CCTV and help

points. Cross-team communication was an essential part of the exercise as all three teams needed to ensure that their designs were compatible with the infrastructure for which the other teams were responsible. The train had to run on the track and fit into the station, while the station had to have enough space for the track and train to run through it.

Tube Lines has over 60 STEM ambassadors from different areas across the business. Their aim is to try and break down the perceived barriers and stereotypes that surround STEM careers.

An LEP partner school, Lilian Baylis Technology School, saw its best-ever GCSE results this summer, with a 15% increase in students gaining five GCSEs at A*-C. Overall, there was a 33% improvement in results compared to 2008.

STEM Ambassadors in Barrow

The Academy helped develop, and delivered in September 2009, booster training for 16 STEM Ambassadors based at the BAE Systems site in Barrow-in-Furness. The training, part of the BAE Systems Engagement Project, looked at issues such as getting the engineering message across, how to get more girls into engineering, what makes a good and bad engineering ambassador and engineering activities that can take place in schools.

The 16 ambassadors are now working together to develop their own outreach activity with help from the Academy, the Cumbria STEM Centre and the Barrow Engineering Project. Based on submarine technology from the Barrow site, the activity will be rolled out to the local primary and secondary schools and delivered by the Ambassadors themselves.

News of Fellows

Professor Dinos Arcoumanis FREng, awarded an honorary doctorate by St Petersburg State Polytechnic University.

Professor Paul Cannon FREng, appointed editor of the American Geophysical Union journal *Radio Science*.

Sir John Chisholm FREng, appointed Chair of the National Endowment for Science Technology and the Arts.

Sir Graeme Davies FREng, appointed Chair of Higher Education Strategy for Northern Ireland.

Professor Kel Fidler FREng received an honorary degree from the University of York.

Professor Sir Richard Friend FREng FRS won the Institute of Physics' Business and Innovation Medal.

Professor George W Irwin FREng, elected a Fellow of the International Federation of Automatic Control.

Professor Nick McKeown FREng, awarded the 2009 IEEE Koji Kobayashi Computers and Communications Award.

Dr Raymond Oliver FREng accepted the role of Senior Research Fellow at the Royal College of Art.

Dick Olver FREng, invited to join the Government's Business Council.

Sir John Parker FREng, appointed Chairman of Anglo-American.

Sir Robin Saxby FREng, awarded honorary degree by University of York.

Professor Christofer Toumazou FREng FRS won the 2009 World Technology Award in the Health and Medicine category.

Professor Christopher Snowden FREng, appointed President of the Institution of Electrical Engineers.

Professor Joseph Hun-wei Lee FREng, elected Vice-President of the International Association of Hydraulic Engineering and Research

Obituaries

Dr Alec Atkin CBE FREng died aged 86 on 2 July 2009. Prior to his retirement, Dr Atkin was Managing Director (Military), Aircraft Group, British Aerospace plc.

Allan Ross Cameron FREng died aged 89 on 9 July 2009. Prior to his retirement, Allan Cameron was Manager, Systems Engineering Group, Associated Nuclear Services.

Professor Peter Dunnill OBE FREng died aged 71 on 10 August 2009. At the time of his death, Professor Dunnill was Professor of Biochemical Engineering, University College London.

Dr Waheeb Rizk CBE FREng died aged 88 in August 2009. At the time of his death, Dr Rizk was a consultant for WR Associates.

Lord Gregson of Stockport AMCT CBIM DL HonFREng died aged 85 on 12 August 2009. Prior to his retirement Lord Gregson was director of: Fairey Group plc, British Steel plc, OSC Process Engineering Ltd, and the National Rivers Authority.

Professor Geoffrey B Warburton FREng FRSE died aged 85 on 1 August 2009. Prior to his retirement, Professor Warburton was Hives Professor of Mechanical Engineering, University of Nottingham.

Contact

If you would like to find out more about any of the articles in this newsletter, or would like to contribute to a future newsletter, please contact:

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Academy says farewell to Ashley Thomas



Leaving the Academy: Ashley Thomas

The Academy is bidding farewell to Ashley Thomas, Director of Finance and Administration for some 15 years, as he prepares for his retirement on 22 September 2009.

Ashley joined the Academy in 1992 and quickly moved into his current role, with responsibility for running the administration, IT, human resources, and

catering departments. During his tenure, the value of the Academy's activities has risen twelve-fold from £4.4 million to £52 million.

Ashley's ability to 'balance the books' fairly and very effectively has become the stuff of legend among his colleagues.

A fellow director at the Academy said: "Ashley's ability to keep all the plates spinning, with no breakages – and also with good humour – has been greatly valued."

The Academy wishes Ashley the best of luck for the future and thanks him for his superb commitment and outstanding professionalism.

Staff news

Howard Beeston has joined as Finance Director of the Academy, replacing Ashley Thomas. Prior to his appointment, Howard was Director of Finance and Administration for the British Olympic Association.

Dr Rhys Morgan has joined the Academy as Head of Secretariat for the Education for Engineering (E4E) initiative. Previously, he was a lecturer for the School of Engineering and Design at Brunel University.

Publications received

Engineering: A Beginner's Guide, by Dr Natasha McCarthy; donated by author.

Charity cycle ride



Three of the Academy's staff, Cuong Dang (pictured, middle), Helen Berrington (right) and Éva Culleton-Oltay (left), are taking part in a charity cycle challenge to raise money for *Engineers Against Poverty* in early 2010. The team would again like to thank all the Fellows who have donated so far to this worthy cause, for their generosity and support. The cycle challenge requires participants to ride 525 km from Ho Chi Minh City in Vietnam to Angkor Wat in Cambodia over eight days. If you would like to make a donation or find out more about the challenge, please visit www.raeng.org.uk/cyclechallenge or telephone 020 766 0649.

News Autumn 2009 – printed on 100% recycled paper

Published by The Royal Academy of Engineering
3 Carlton House Terrace, London SW1Y 5DG
Tel: 020 7766 0600 Fax: 020 7930 1549 www.raeng.org.uk
Edited and designed by Chris Atkinson



The Royal Academy of Engineering promotes excellence in the science, art and practice of engineering.
Registered charity number 293074