

ANNUAL REVIEW

Report of the Council of **THE INSTITUTION OF ELECTRICAL ENGINEERS** for the year ended 31 March 2000

IEE VISION

To be the best engineering institution in the world.

A NEW STRATEGY FOR A NEW MILLENNIUM

In 1998 a President's Working Party was set up to identify how the Institution should respond to the current and future unprecedented changes in the engineering community and to develop a strategy which would take it successfully to 2005. The Working Party's report was presented to Council in October 1999 after which the IEE embarked on one of the most extensive membership consultations that it had ever undertaken, with presentations at more than 100 venues around the world. Valuable responses were received from members, Centres, Boards, Committees and staff.

The strategy identified a vision, objectives and overall philosophy and made 54 recommendations that related to the three distinct roles of the Institution, namely qualifying, professional services, promotion and interaction with the external world, as well as the governance and management of the Institution. The final report was overwhelmingly endorsed by Council in January 2000 and its implementation is now under way.

TOMORROW'S ENGINEERS

The IEE published a report on *Information and Communications Technology (ICT) and Education in 2020*, which considers the impact that ICT may have on education at primary and secondary school level in fifteen to twenty years' time. The work was undertaken as a Foresight Associate Programme for the Office of Science and Technology. Its aim is to provoke lively discussion within Government, the teaching profession and society, about the longer-term decisions which must be taken to shape the future course of schools education in the UK.

June 1999 saw the National Final of the *Today's Engineers Make The Things We Need* drawing competition for 5-7 year olds. Organised by the IEE in conjunction with twelve

sister professional engineering organisations, the competition attracted thousands of entries. Laura Williams, aged 5, from St Johns CE Primary School at Crossens, Southport, won the competition with a colourful picture of professional engineers at work.

The 2000 IEE Faraday Lecture '*Time and place in the communications age*', presented by University College London and supported by Marconi, inspired student audiences throughout its three month tour of the UK. Over 60,000 14-16 year olds attended the lecture which combined interactive experiments with multimedia presentation. The Lecture was also broadcast live via satellite to schools in the USA and Canada and via Eutelsat to much of Western Europe. It was also shown in Australia and New Zealand.

Two television programmes based on the 1999 Faraday Lecture were broadcast on Channel 4 Schools television in March 2000.

January 2000 saw the launch of the new *Advancing Physics* syllabus for AS and A level physics developed by the Institute of Physics with the support of the IEE and Oxford Cambridge and RSA Examinations. The course, which will start in schools in September 2000, forms a key part of a joint IEE/IoP initiative to reverse the decline in the numbers of students studying physics beyond the age of 16.

Following its successful trial in Staffordshire during 1998/1999 the *Marconi Days* project was extended successfully to Wales, Manchester and Coventry. The scheme provides significant professional development and training for design and technology teachers and greatly enhances the delivery of electronics in the classroom.

A new *Micromouse* 'Grand Prix' competition was introduced for schools in 2000. Regional competitions were held in Birmingham, Edinburgh, Swansea and Stevenage involving almost 150 schools of which 24 were selected to go forward to the National Final. As well as awards for negotiating pre-set Micromouse circuits, special challenges - 'Economouse', 'MicroMuse Mouse' and 'Rat Race' - were also introduced adding a fun dimension to the competition.

As part of its ongoing campaign to encourage high-quality young people to enter the profession, the IEE awarded over £65,000 in scholarships, prizes and grants to school leavers, undergraduates and postgraduates of outstanding ability. Fourteen travel awards, worth a total of £7,500, including the Princess Royal Scholarship for service in a developing country, were also awarded.

RAISING THE PROFILE

A key role of the Institution is to identify matters of public concern that have an engineering dimension and to represent the views of the profession on these matters to industry, academe, government and other national and international agencies and policy makers.

36 submissions were made throughout the year, several on educational topics. Other issues ranged from e-commerce to high bandwidth communication over the 'wired' network. Another submission to the Radiocommunications Agency commented on high bandwidth communication over the 'wireless' network.

The IEE again exhibited at **Tomorrow's World Live** which attracted 41,000 visitors. The IEE stand proved as popular as ever and included a robotics area run by the University of Reading and a Web-feature opened by Technology Minister, Lord Sainsbury. The IEE also had a major presence at the Annual Festival of the British Association for the Advancement of Science.

The 1999 Archives Summer Exhibition focused on '*Secret machines: British code-breaking during World War II*'. To complement the exhibition, a Lecture on the 'World War II origins of the computer' was given by Dr Martin Campbell-Kelly of Warwick University. An earlier Archives exhibition, '*Selling light*', remained on display in the Lighting Gallery of the Science Museum where it was seen by many thousands of visitors.

In December 1999 the IEE hosted the *PAWS (Public Awareness of Science and Engineering) Drama Awards* which attracted over 350 scriptwriters, journalists, television executive producers, scientists, engineers and industrialists. Sponsored by the IEE, the Awards aim to raise public awareness of science, engineering and technology.

Mr Goran Lindahl, President & CEO of ABB Asea Brown Boveri, was the principal guest at the IEE Annual Dinner. Some 1,500 members and guests attended the event which was held at London's Grosvenor House in February 2000.

SERVING SOCIETY

The IEE Working Party on the Possible Biological Effects of Low-level Electromagnetic Radiation assessed over 1,200 research papers during the year. It advised on the input made by the IEE to the Science & Technology Committee of the House of Commons on possible biological effects of mobile phones and was subsequently invited to provide evidence to the

Independent Group of Experts set up by the Health Minister, Tessa Jowell. This took the form of an assessment of all the peer-reviewed papers published during 1998 and 1999 relevant to the health effects of mobile phones.

The Working Party maintained a close watching brief as the results of the largest ever epidemiological study of the causes of childhood leukaemia, chaired by Sir Richard Doll, were published in *The Lancet*. The eight-year study had investigated the exposure to electromagnetic fields of 2,226 children in the UK with cancer and the same number without. It concluded that magnetic fields from electricity pylons or household appliances do not cause childhood cancer.

WORKING WITH INDUSTRY

In February 2000 the IEE launched a new guidance document - '***Safety, competency and commitment - competency guidelines for safety-related system practitioners***'. The guidelines, which were produced in collaboration with the British Computer Society and the Health and Safety Executive, are the first in the world to provide industry with a framework within which to monitor the competence of staff working on safety-related aspects of electronic systems.

Industrial Affiliates ran a highly successful seminar covering many aspects of professional development in October 1999. The seminar provided an overview of recent changes to the initial and continued training and development of professional engineers, including some experiences from both the engineer and the employer. The Lord Dearing, Chairman of the University for Industry Ltd, addressed an Industrial Affiliates lunch meeting in November 1999.

The IEE Industry Groups - Aerospace, Multimedia Communications, Medical Focus, Road Transport and Railway Industry - continued to focus on the needs of professionals and engineers in industry. Highlights for the year included a Seminar on '***Multimedia convergence - an opportunity for new business***' which examined the effect of technology convergence in the telecommunications, computing and broadcasting industries in terms of the opportunities presented and how well the UK is positioned to take advantage of them.

2000 also saw the launch of a Food Industry Group which is supported both by academe and industry and will have an influential voice in food engineering. A newly reorganised IEE Medical Focus Group has also strengthened the IEE's presence in the medical arena.

SERVING THE PROFESSION

Technical Affairs

A new version of the *IEE Wiring Regulations CD-ROM* was introduced incorporating 'knowledge links' from the Guidance Notes. The electronic version of the 'Regs' is being used widely by Government departments, industry and academe. A new complementary CD-ROM update service has been introduced to allow subscribers immediate access to all newly published Guidance Notes.

The IEE continued to advise on draft proposals for the introduction of electrical installations into the Building Regulations by the Department of the Environment, Transport and the Regions (DETR) and also made a submission to the Department of Trade and Industry on its proposals for revisions to the Electricity Supply Regulations 1988.

A new edition of *Model Form of General Conditions of Contract MF/2, Home or Overseas Contracts for the Supply of Electrical or Mechanical Plant* was published in 1999.

Qualifications

The IEE has developed objective criteria for assessing 'Competence and Commitment' - the new route to attaining chartered status under SARTOR 97 - and trials have taken place to evaluate the new procedures.

In 1999 accreditation visits were made to 24 universities and other higher education establishments offering 151 engineering degrees in disciplines relevant to the IEE. An increasing number of establishments outside the UK are keen to have their degrees given an international stamp of approval. Similarly, by the end of 1999 twenty-two industrial companies had had their professional development schemes accredited by the Institution under the new SARTOR regulations.

Professional Development

The IEE has been working closely with the Institution of Mechanical Engineers and the Institution of Incorporated Engineers to promote the value of professional development and provide guidance to members on how to plan, structure and record their career progression. There was extensive collaboration over the new Professional Development Record Folder

and many of the sections are common to members of all three institutions.

An Executive Development Group was established in the Coventry area by the IEE Courses Unit. This is a facilitated, confidential discussion group for Senior Executives and Directors of companies who often face problems and difficulties that they are unable to discuss within their own work places.

A major new service to support members' professional development through mentoring was launched in 10 pilot Centres in 1999 and some 50 mentor/mentee pairs were established.

The IEE also took a leading role, through the Devon and Cornwall PEI, in establishing four local networks to help engineers and employers in the South West to manage individual learning and share best practice in professional development. These groups offer mentoring and Web-based support, regular networking opportunities, and training in the disciplines of reviewing, planning and assessing achievement.

The IEE Career Advisory Service was substantially improved during the year. There are now 161 UK advisers providing guidance and assistance to members on all aspects of career progression, from working abroad to coping with the prospect of redundancy.

The Courses Unit continued to offer short courses on a commercial basis to members and non-members. The year's programme comprised some 100 Electrical Series courses and 40 courses covering professional development topics. As the unit offers qualifying courses, it also runs as an Approved City & Guilds (C&G) Centre conducting examinations.

Knowledge Services

Restructuring and change have been a key feature of the IEE's Knowledge Services activities as plans were formulated for Professional Networks (PNs) to replace the current Professional Groups and Industry Groups. The new PNs will be worldwide groups of members (and potential members) with common technical or professional interests. This change in operation will result in the delivery of improved products and services. Despite this emphasis on strategic change, all of the Divisions have had a busy year.

In June 1999 the **Control Division** organised its first online event '*InterActive 99*' - a two-week virtual workshop on active noise and vibration control hosted on the Division's Website and the IEE's *Computer Forum*. The event attracted 95 official registrants, 3,683 hits and a range of papers published on the Web by international authors.

Another first was the **Electronics and Communications Division** Open Forum held in July 1999. Almost 400 delegates attended the new style event that combined lectures and workshops with the opportunity to network with colleagues. More than 40 research teams from some of the biggest names in UK electronics and communications used the event to display work in progress through poster displays and demonstrations. The Forum ended with a Lecture by Sir Peter Bonfield.

The **Informatics Division** maintained its strong, world class lecture programme. Speakers included Professor Ian Sommerville, Dr Robin Saxby and Mr Tom Gilb. The Second Annual Turing Lecture delivered by Professor Brian Randell was held in Edinburgh in January 2000.

The **Management Division** organised a wide range of meetings relevant to engineers of all disciplines. Its annual Workshop on *'Commercial awareness for engineers'* remained a big hit with Younger Members and the Consultants Group continued to address the needs of the self-employed consultant with its programme of Roadshows on *'So you want to be a consultant?'* and *'Profitable consulting'* which visited Kent, Surrey, the South West, the Thames Valley, the Midlands, Scotland and Paris.

Technical Visits to Nokia, London Underground, Ericsson, Racal Avionics, Ford, Jaguar, JCB and the University of Reading, organised by the **Manufacturing Division**, provided manufacturing professionals with the opportunity to see the implementation of best practice and the development of new technologies for themselves. Also of particular note was the *'Rethinking manufacturing'* one-day Conference where senior industrial and academic speakers briefed delegates on the threats and opportunities of global markets, virtual supply chains, electronic commerce and demographic and social change.

In May 1999 the **Power Division** held a Discussion Meeting on *'Radioactive waste management'* in response to the House of Lords Select Committee report. Dr Robert Hall and Lord Tombs of Brailes, Chairman of the Science and Technology Select Committee, made the closing remarks. In March 2000 a Seminar on *'Electricity trading'* examined the announcement in the Queen's Speech of new legislation to create completely new market arrangements for electricity in England and Wales.

A major highlight within the **Science, Education and Technology Division** lecture series was a presentation by Mr Donald McLean on *'Restoring Baird's image - the restoration of the world's earliest known television recordings'*, which attracted over 200 people. Other key speakers through the year have been Mr Peter Swannell of the University of Southern

Queensland and Mr Gunnar Fernqvist of CERN, who presented the 1999 Measurement Lecture. The Division's programme of residential courses continued with events on '*Microwave measurement*', '*Pulsed power*' and the *History of Technology Weekend Meeting*. A new residential course on 'Plasma technology' was also launched.

Conferences and Exhibitions

Glasgow played host to the *1999 World Micromachine Summit* which was organised by the IEE. This invitation-only event attracted delegations from over 20 different countries.

The 16th *International Teletraffic Congress* (ITC-16) returned to the UK for the first time in over 30 years, following a successful bid by the IEE to organise this prestigious event in Edinburgh in June 1999. Participants enjoyed a very full programme throughout the week-long event, focusing on the challenges facing performance engineering in the face of increased competition and new technology.

The 9th International Conference on '*Artificial neural networks*' (ICANN) was held in Edinburgh during September 1999. ICANN amalgamated the IEE and ENNS events, attracting an audience of over 280 representing 20 different countries. This event was used to launch '**Flashpoint**' - a Web-based information source which presents the key outcome of IEE events within 24 hours of their conclusion.

INSPEC

The INSPEC National Site Licence which allows unlimited access to the database in academic establishments and Research Councils throughout the UK and Irish Republic and which was introduced in September 1998 grew rapidly through 1999. Over fifty universities had bought access to the programme by the end of the year. In addition, the concept of a National Licence has been extended outside the UK and has now been established in many countries including Australia, Italy, Poland, and Sweden.

In North America, an INSPEC office has been established in Edison, New Jersey. The five staff running this operation are responsible for promoting all INSPEC and Publishing products and services as well as providing customer support and training.

The Computer Forum

In the two years since its launch, *The Computer Forum* has become a successful and valued online information service for IT professionals and engineers working in the computing arena. The number of registered users has continued to grow impressively, reflecting the value for busy professionals of receiving industry news, professional-level articles, careers information and other services online. Users can take part in discussions and a number of IEE groups now use the service to host 'virtual meetings'. Audio coverage, with synchronised slide presentations, and in some cases video coverage, is now being provided for selected IEE lectures and other events, extending the benefits of membership for those unable to visit the IEE's UK premises. The Computer Forum (<http://forum.iee.org.uk/>) is open to all members free of charge.

Books

Television: an International History of the Formative Years by Professor R W Burns won the prestigious 1999 Kraszna-Krausz Moving Image Book Award for the best book in the Business, Techniques and Technology category. Over 300 books were entered for the 1999 awards, from 11 countries. Part of the IEE's *History of Technology Series*, Burns' book was praised as the most thorough historical account of television yet written.

Competing against several commercial publishers, in January 2000 the IEE won a tender to become the publisher for British Telecom's *BT Technology Series* of telecommunications books.

Benevolent Fund

The Incorporated Benevolent Fund of the IEE has been providing financial help to needy members and their dependants in the UK and throughout the world for over 100 years. In 1999 around £500,000 was provided in grants to almost 350 beneficiaries.

UK CENTRES

Centres have begun the process of change - in structure, range of responsibilities and culture - which aligns them firmly with the IEE's new strategy and emphasises their role as the principal contact between the individual member and the Institution. Centres continue to be active in debating the further development of their operations.

An interesting trial in the Yorkshire Centre has demonstrated the importance and practical value of targeted promotion of events. Greater emphasis is being given to marketing generally, and an increasing number of Centres now have their own Webpages at <http://centres.iee.org/> under a trial scheme now into its second year.

Younger Members Sections continue to be very active, and this year's Chairmen's Conference included a presentation by the Head of IT at the London Stock Exchange and a visit to Reuters Global Technical Centre.

INTERNATIONAL AFFAIRS

1999 saw a continued increase in the number of International Younger Members with the development of new Younger Members Sections in Calcutta, Toronto and Victoria. New International Council Representatives were appointed to Malta and the Philippines.

The two annual Conferences for International Honorary Officers were held at Savoy Place in October 1999 and March 2000. As well as workshops and training sessions the meetings offered delegates a valuable opportunity to network and share information and experience.

A two-day Workshop on 'Intelligent control in industry and society' was organised by the IEE Control Division in close co-operation with the Beijing and Hong Kong Centres and held at the Beijing International Convention Centre in China, to coincide with the World Congress of the International Federation of Automatic Control (IFAC).

Links between the Manufacturing Division and peers in the United States were cemented in August 1999 by the signing of a Memorandum of Understanding with the American Society of Manufacturing Engineers.

AWARDS AND HONOURS

One of the highest distinctions offered by the Institution is the award of the **Faraday Medal**, which is given either for notable scientific or industrial achievement in electrical engineering or for conspicuous service rendered to the advancement of electrical science. The 78th award of the Faraday Medal was made to Professor Michael Brady FREng MSc PhD FRS FIEE for his outstanding work using computer-based pattern recognition and image analysis techniques to solve important problems in both robotics and medical imaging, for his entrepreneurial role in three start-up companies, and for many other related activities.

The IEE Council also elected to **Honorary Fellowship** of the Institution:

Dr John C Williams OBE FREng BSc(Eng) PhD for his outstanding leadership as Secretary and Chief Executive of the IEE over a decade of rapid change within the Institution and the engineering profession; and for his contribution to the development of the new Engineering Council.

Sir Alan Rudge FREng FRS PhD for his exceptional contributions to both engineering and the profession by his inspired technical leadership in several major companies; and for his outstanding contribution to the Engineering Council and the Institution of Electrical Engineers.

The J J Thomson Medal was awarded to Professor Dr-Ing Ulrich Reimers for his outstanding work in the field of digital television broadcasting.

The Measurement Prize was awarded to Professor Roger Pollard, Dr Stavros Iezekiel and Mr Balasundaram Elamaram for their work on lightwave network analysis.

FINANCIAL HIGHLIGHTS FROM 1999

Honorary Treasurer's Report on the Financial Results for 1999

The Institution has had a successful year, with net incoming resources from operations of £3.1m including investment income of £2.4m and when the net investment gains of £11½m are included, we were able to increase our Fund balances by over £14½ m, to £95.8m which was £9.6m more than the 1998 increase. The market values of our investments were at record levels at the year-end.

Total incoming resources in the year were £33,037,000 and our Publishing and Information Services (INSPEC), our Conference programme, our two trading companies, PPL and IEECL have all performed well, as have our investments; Net Investment Gains at 31 December reported in the Statement of Financial Activities were £11½m.

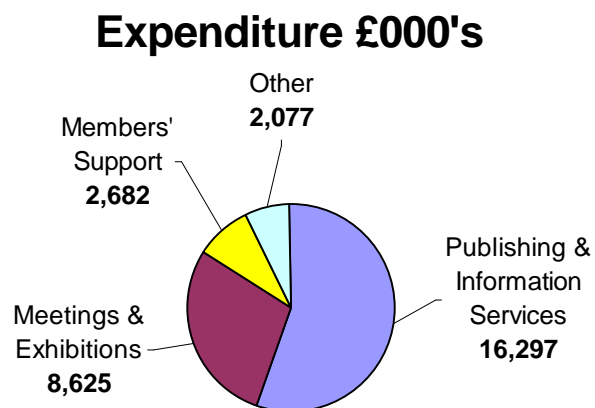
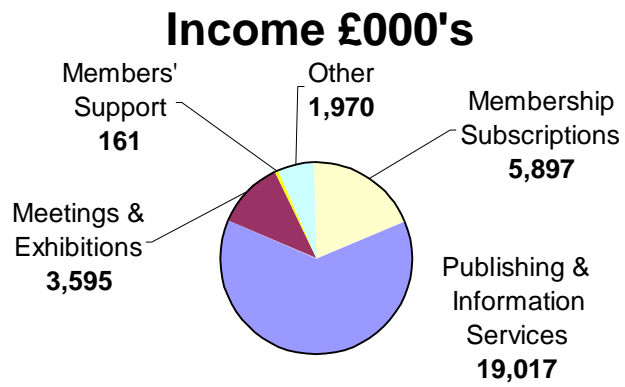
Total resources used in the year in undertaking all our activities was £29,938,000 which included expenditure of £179,000 on projects which are funded from our Reserves. When we take last year's reserve-funded expenditure of £1,848,000 into account, expenditure on our underlying activities increased by £956,000 or 3 1/3%. This increase provided a larger

conference and exhibition programme, increased activities in the Centres, and an increased number of items added to INSPEC's database.

The market value of our investments at 31 December stood at almost £76m and the total value of our reserves was almost £96m. We have some strong challenges ahead with the implementation of the new Strategy, significant new expenditure on CPD and Electronic Publishing, investment in ITEC, and further enhancement of members' facilities including the Library. The Institution is in a strong financial position and well able to meet and respond to these challenges in delivering its charter objectives.

The above are the highlights of the Honorary Treasurer's Report which is included in the full annual report and accounts, copies of which will be available at the AGM or on request from the Chief Executive at Savoy Place.

Operating Activities



Summary of Financial Results for the Year Ended 31 December 1999

	Income £000s	Expenditure £000s
Membership Subscriptions	5,897	-
Publishing and Information Services	19,017	16,297
Meetings and Exhibitions	3,595	8,625
Members Support	161	2,682
Other	1,970	2,077
Operating Activities	<u>30,640</u>	<u>29,681</u>
Investment Income	2,377	257
Restricted Income	20	-
Totals	<u>33,037</u>	<u>29,938</u>

In addition, there are net investment gains of £11,500,000.

Balance Sheet

31 December 1999

	£000s
Fixed Assets	17,557
Investments	75,598
Current Assets	15,222
Less Current Liabilities	<u>(12,561)</u>
Net Assets	<u>95,816</u>
Unrestricted Funds	30,331
Unrestricted Designated Funds	<u>60,446</u>
	90,777
Restricted Funds	<u>5,039</u>
	<u>95,816</u>

Trustees' Statement

The summarised accounts are extracted from the full unqualified audited accounts prepared in accordance with the Charities Act 1993, which were approved by the Trustees on 9 March 2000. These accounts were subsequently submitted to the Charities Commission.

C W Davidson
Honorary Treasurer
9 March 2000

Auditors' Statement

Auditors' Statement to the Trustees of The Institution of Electrical Engineers

We have examined the summarised financial statements set out on pages 00-00.

Respective Responsibilities of Trustees and Auditors

You are responsible as Trustees for the preparation of the summary financial statements. We have agreed to report to you our opinion on the summarised statements consistency with the full financial statements, on which we reported to the Trustees on 9 March 2000.

Basis of Opinion

We have carried out the procedures we consider necessary to ascertain whether the summarised financial statements are consistent with the full financial statements from which they have been prepared.

Opinion

In our opinion, the summarised financial statements are consistent with the full financial statements for the year ended 31 December 1999.

Binder Hamlyn

Chartered Accountants and Registered Auditors
9 March 2000

The summarised accounts may not contain sufficient information to allow for a full understanding of the financial affairs of the charity. For further information, copies of the full annual accounts, unqualified auditors' report and the Trustees' Annual Report may be obtained by writing to the Chief Executive at Savoy Place.

The IEE is registered as a charity.

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