



Lloyd's Register
Foundation

Foundation Review 2013



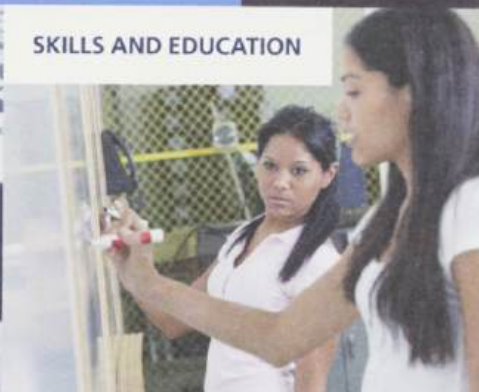
Lloyd's Register Foundation
funds science, engineering
and technology for public
benefit, worldwide.



SCIENTIFIC RESEARCH

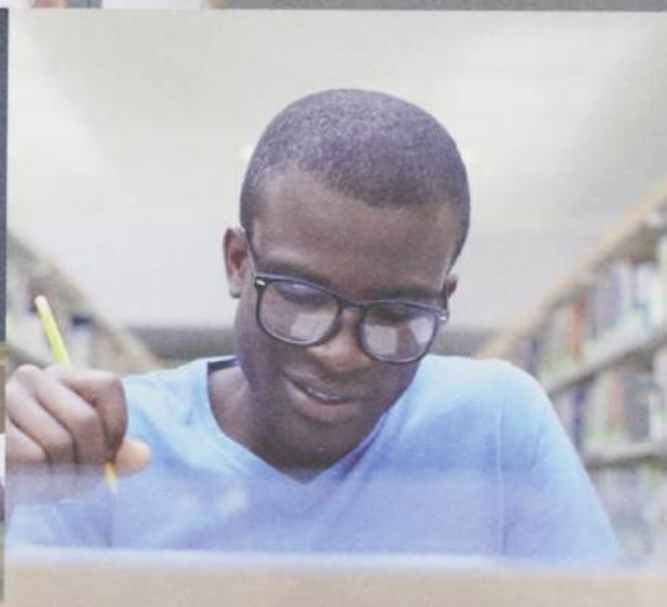


SKILLS AND EDUCATION



Find out more about
Lloyd's Register Foundation
online at
www.lrfoundation.org.uk

PUBLIC ENGAGEMENT



APPLICATION OF RESEARCH



We help protect life and property and advance engineering education and research because life matters

CONTENTS

- 2 Highlights
- 3 Introduction
- 4 Chairman's statement
- 6 Governance overview
- 7 Objectives and strategy
- 10 Activities 2012/13:
 - 12 Research
 - 14 Pre-university education
 - 16 University education
 - 18 Vocational training and professional development
 - 19 Safety of life
 - 20 Public education

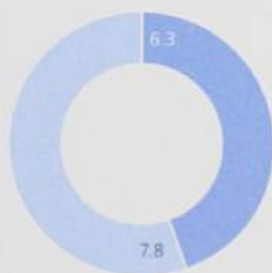
FUNDING FOR THE FUTURE: NEW STRUCTURE WILL HELP PROVIDE THE BEST RETURN FOR SOCIETY

- New charity set up with a £206 million donation after a restructuring of an exempt charity
- Established solid foundations for the future
- New strategy agreed to ensure future success
- Merger with the Lloyd's Register Educational Trust
- Change to agenda-setting approach to funding
- Amalgamation of the Lloyd's Register Library
- Successful 2012 Research Collegium
- 2013 Research Workshop in Seoul

FOUNDATION INCOME

Total Foundation income
(charity only, excluding one-off items)

£14.1 million

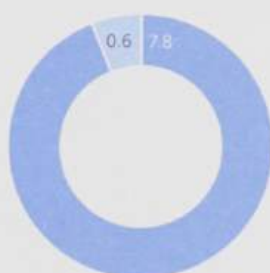


■ Listed investments
■ Unlisted investments

CHARITABLE EXPENDITURE

Total Foundation expenditure
(charity expenditure only)

£8.4 million



■ Research
■ Other

NEW CHARITY BASED ON LONG TRADITION

Our public benefit activity has a long tradition and we are building on the work of the Lloyd's Register Educational Trust and the Lloyd's Register exempt charity history.

A NEW CHARITY

Lloyd's Register Foundation is a new charity, set up in 2012. We fund the advancement of engineering-related education and support work that enhances safety of life at sea, on land and in the air.

We are funded by the profits of our trading arm, Lloyd's Register Group Limited, a professional services organisation working mainly in the transportation and energy sectors, which also delivers part of our charitable objects.

A PUBLIC BENEFIT HISTORY

The history of our name dates back to 1760 through our trading group, with its long tradition of public benefit.

Safety has been at the heart of Lloyd's Register's work since 1760. In that year, 11 men met in Edward Lloyd's coffee house to talk about publishing a list of ships, a register to define their quality and safeguard life and property carried on them. In the years since then, Lloyd's Register has applied its expertise across the energy and transportation sectors, helping to make the world a safer place.

Lloyd's Register's constitution required it to enhance the safety of life and property at sea, on land and in the air. Further, it required the organisation to support public education within the transportation industries, engineering and technological disciplines. For many years, it made funds available for this purpose. In 2004, to bring a sharper focus and greater professionalism to its charitable work, it set up the Lloyd's Register Educational Trust (LRET) to fund advances in transportation, science, engineering and technology education, training, and research worldwide for the benefit of all. During an eight-year period the LRET received over £55 million from Lloyd's Register.

In 2012, Lloyd's Register recognised a change in structure was needed to meet the evolving law around public benefit. It decided to create a new parent foundation while converting itself from an industrial and provident society to a company limited by shares called Lloyd's Register Group Limited, with all shares owned by the Lloyd's Register Foundation. This change in status was duly effected on 2 July 2012, with the help and support of the Charity Commission, Companies House, the Financial Services Authority and HM Revenue & Customs. With the change in structure of Lloyd's Register, and its ownership by a registered charity, the trustees of the LRET also resolved to transfer its assets and liabilities to the Lloyd's Register Foundation with effect from 1 March 2013, as the best way of furthering the LRET's objects.

Importantly, the objectives and mission of the Foundation remain the same as those of Lloyd's Register previously, to protect life and property and to advance transport and engineering education and research... because life matters.

OUR OBJECTIVES

To secure for the benefit of the community high technical standards of design, manufacture, construction, maintenance, operation and performance for the purpose of enhancing the safety of life and property at sea and on land and in the air.

The advancement of public education including within the transportation industries and any other engineering and technological disciplines.

NEW CHARITY WILL HELP MEET TOMORROW'S CHALLENGES



"This year, we have taken the time to consider the best way forward for this new charity, to ensure we set up firm foundations to make the best possible contribution to help tackle society's challenges of the future."

THOMAS THUNE ANDERSEN
Chairman

It is with great pleasure that I write the Chairman's statement in the annual review for the Lloyd's Register Foundation, a charity committed to protecting life and property and to advancing transport and engineering education and research.

A FOUNDATION FOR THE FUTURE

The Foundation was established in January 2012. On 2 July 2012, Lloyd's Register was converted from an industrial and provident society to a company limited by shares, named Lloyd's Register Group Limited, with the Foundation as the sole shareholder. Lloyd's Register then gifted to the Foundation a substantial bond and equity portfolio to assist it with its charitable purposes and it will benefit from continued funding from the trading arm. The Foundation has therefore become a major UK registered charity.

This change in structure was made to increase the funds, in the longer term, which the new parent charity would have available for direct charitable purposes. The new governance structure will optimise the commercial operations of Lloyd's Register Group Limited which further the charitable objects and, in turn, fuel the direct charitable output of Lloyd's Register Foundation.

As with any new entity, we have worked hard over the past year to build up a governance structure that is fit for purpose and consistent with Charity Commission best practice, and to ensure solid foundations on which to grow. The trustees believe that the Foundation will bring benefits to society through long-term and sustained support in line with its objectives and have therefore reflected this in their investment policies.

Lloyd's Register had been the sole donor of the Lloyd's Register Educational Trust (LRET). Following the restructuring of Lloyd's Register, the trustees of the LRET decided that they would gift its assets and liabilities to the Lloyd's Register Foundation. The Foundation was pleased to take over a number of successful programmes which were being run by LRET and will benefit from the excellent work done by the trust since it was set up in 2004. In that regard, the Foundation trustees would like to extend their sincere thanks to the trustees of the LRET, including Nigel Hollebhone and Peter Christmas who have been such great ambassadors for the trust over the past eight years.

During the year, we have added to the Foundation's resources by agreeing to take over the Lloyd's Register Library, which is operated by an Information Centre. The library now contains in excess of 54,000 items and is one of the great resources still available for current and historic information concerning maritime history, marine engineering, naval architecture, offshore engineering and ocean technology, offering resources freely to those undertaking research. The Information Centre also fulfils a public education role.

NEW STRATEGY

The Foundation has been established to further two charitable purposes, the enhancement of safety of life at sea, on land and in the air, and the advancement of engineering and science related education. The trustees of the Foundation have taken time to try to identify areas where we can make the biggest contribution to society. We have also commissioned a 'white space' review, including leading academics and others, to try to identify areas where little or no funding is being applied – where we can make a real difference.

We will focus our direct charitable grant giving into four thematic areas: structural integrity and systems performance, resilience engineering, social and human factors, and emergent technologies. We arrived at these themes from three perspectives: by considering the systems and structures themselves, the environment in which they sit, and their human interface. A fourth theme, emergent technologies, will ensure that we keep forward looking. At the heart of these themes is the aim to enhance the safety of the critical infrastructure which is vital for society – necessary for the sustainable continuation of human life.

Within these four themes, the Foundation will build on the works of the LRET, by focusing activities on scientific research, application of research, public engagement, and skills and education.

COMMITMENT TO SUCCESS

The Foundation will rely heavily on its trading arm to generate profits which can be gifted to the Foundation, and the activities of this trading arm, working for a safer world, help to fulfil the first of our charitable purposes. The success of the Foundation and of Lloyd's Register Group Limited are therefore strongly connected. The trustees would like to extend their thanks to Richard Sadler, Chief Executive Officer of Lloyd's Register Group Limited, for his strong leadership during difficult economic times, to the Board and management of Lloyd's Register Group Limited and to all of its employees worldwide, who every day, in performing their jobs, are directly or indirectly making a real difference to society.

As Chairman, I should like to offer my sincere thanks and appreciation to my fellow trustees, who have worked together so enthusiastically and ably to help shape the new Foundation. Their commitment to seeing the Foundation become a major success is manifest in all they do. I should also like to welcome Sir Brian Bender to the Board. We look forward to drawing on his extensive skills and knowledge going forward.

During the year, the trustees have been helped in their work very ably by Alastair Marsh, who has held the position of Interim Foundation Director, and by its Secretary, Keith Povey. Michael Franklin, Grants Director, has led the grant giving process, supported by a new grants committee, chaired by Lambros Varnavides.

We are very pleased to announce the appointment of Professor Richard Clegg as the new Foundation Managing Director. Richard has been with Lloyd's Register since 2010 as Global Nuclear Director for the Energy business. He brings a wealth of experience from the nuclear sector and has worked in industry, academia and government in both the civil and defence sectors. We look forward to working with him to develop and implement our new strategy.

THOMAS THUNE ANDERSEN

Chairman, Lloyd's Register Foundation

STRUCTURED FOR BEST PRACTICE

The Foundation is governed by a Board of Trustees, which is responsible for setting the Foundation's strategy and for ensuring it fulfils its objectives – delivering public benefit – and for ensuring good governance.

The Board is currently made up of seven trustees who are also the members and directors of the Foundation for Companies Act purposes. The Board considers Foundation policies, receives committee reports and recommendations, approves annual budgets, reviews the performance of the trading arm, and guides the Managing Director.

The Board is supported by four sub-committees, which have delegated authority on certain matters. Trustees and other non-executives sit on the sub-committees.

COMMITTEES

The investment committee reviews the performance of the Foundation's investment managers, under delegated authority and overall direction from the Board, in line with the Foundation's investment policy.

Grant applications are reviewed, appraised, and recommended for approval by the grants committee, in line with the grants policy. The grants committee meets six times a year at two-monthly intervals.

The audit and risk committee reviews matters relating to governance and risk. The committee meets three times a year, at four-monthly intervals. The committee receives reports from an in-house internal audit function, and the external auditors.

The nominations committee is responsible for making recommendations to the Board of Trustees for appointments to the Foundation, principally for identifying candidates for trusteeship of the Foundation. The committee will also approve candidates for executive leadership roles within the Foundation and senior appointments to the trading arm, including the Board of Lloyd's Register Group Limited, on behalf of the Foundation as sole shareholder.

BOARD OF TRUSTEES



Thomas Thune Andersen
Chairman, Lloyd's Register Foundation and Lloyd's Register Group Limited



Sir Brian Bender
Chairman of the London Metal Exchange, and a governor of Dulwich College



Christine Dandridge
Holds non-executive positions in the insurance industry and is an advisor to BTG Pactual



Ron Henderson
Former CFO of Network Rail and Balfour Beatty



Jan Kopernicki
Director of J&J Denholm Limited, Nordic Tankers Holding AB and the UK Chamber of Shipping



Michael Lykiardopulo
Managing Director of Lykiardopulo & Co. Ltd.



Lambros Varnavides
Managing Director and Global Head of Shipping at The Royal Bank of Scotland

Funding for the benefit of society as a whole



IMPACT AND EXCELLENCE – A FOCUSED APPROACH FOR THE FUTURE

OUR OBJECTIVES

To secure for the benefit of the community high technical standards of design, manufacture, construction, maintenance, operation and performance for the purpose of enhancing the safety of life and property at sea and on land and in the air.

The advancement of public education including within the transportation industries and any other engineering and technological disciplines.

The Foundation's most obvious and direct means of achieving its mission is through awarding grants to research and education organisations.

The trading arm, in addition to generating funds which are gifted to the Foundation, also delivers public benefit on behalf of the Foundation through the independent assurance and expert advice it provides to companies operating high-risk, capital-intensive assets in the energy and transportation sectors. It helps its clients to ensure the quality construction and operation of critical infrastructure by checking assets against internationally agreed rules and standards and the provision of sophisticated risk management services. The Information Centre, within Lloyd's Register Group Limited, supports public education, offering library and research resources to the public, which supports the Foundation's second objective. The Foundation trustees therefore have decided to view Lloyd's Register Group Limited as a mixed motive investment, generating funds but also delivering part of the Foundation's charitable purposes, and have reflected this in their investment policies.

NEW STRATEGY – A FOCUSED APPROACH

The Lloyd's Register Foundation is a relatively new charity. Much of the trustees' time since its formation has therefore been spent in determining how best to use its charitable funds in order to fulfil its objectives and provide the best return from a public benefit

FOUR RESEARCH THEMES:

STRUCTURAL INTEGRITY AND SYSTEMS PERFORMANCE



Aim:

To enhance the safety of the critical infrastructure important to society through understanding the physical behaviour, ageing and degradation of performance of structures, systems, components and materials

Examples:

- Integration of component elements into dependable systems
- Materials' properties – defect initiation, formation and growth
- Loads and stresses – predictive modelling and simulation
- Reliability and performance data
- Condition monitoring, fault detection, characterisation

RESILIENCE ENGINEERING



Aim:

To understand the risk and impact of disruptive events and extreme weather on structures, organisations and critical infrastructure

Examples:

- Adaptability and responsiveness of structures, systems and organisations to disruptive events and extreme weather
- Continuity management
- Supply chain resilience
- Improvements to engineering design
- Risk analysis
- Standards and codes

FOUR ACTIVITIES:

SCIENTIFIC RESEARCH

APPLICATION OF RESEARCH

perspective. The trustees believe that the Foundation should focus on a small number of themes as that will allow it to become a leader in these fields and enable it to build up specialist expertise in these areas.

In future, the Foundation's grant giving will be focused on four themes which are related to the enhancement of the safety of the critical infrastructure upon which society relies. The trustees have approached this from three angles: by considering the systems and structures themselves (theme – structural integrity and systems performance); the environment in which they sit (theme – resilience engineering); and the human interface (theme – social and human factors). A fourth theme has been added capturing 'emergent technologies' to ensure the Foundation maintains a forward-looking vision. The trustees have drawn the themes with sufficient flexibility to enable the Foundation to follow new avenues of research which it may decide suitable to explore in the future.

Within the four themes, the Foundation will focus on four activities: scientific research, application of research, public engagement, and skills and education. The application of research is important to maximise the translation of the basic research that the Foundation funds and its development to solve practical problems for the broader benefit of society. Public engagement will involve disseminating findings to a wider audience. This both raises

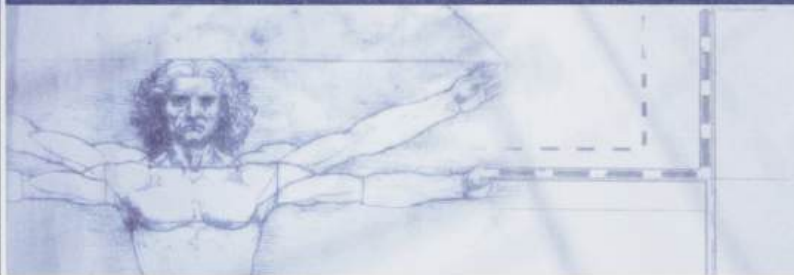
the profile of the Foundation and adds to the societal debate about safety and risk where the public perception is often different from reality.

Where possible, the aim is to maximise the intellectual and financial leverage of the Foundation's charitable activities through clustering expenditure in selected international centres of excellence. Through this approach universities can get access to other funding sources not directly available to the Foundation or business. This should increase the size of the research pot which in turn will increase the impact and sustainability of research teams.

The Foundation would prefer, ideally, to concentrate its funding in areas where there is little or no alternative funding, so that it can make a real difference to society. The trustees have commissioned a trial study to identify where 'white space' might exist within one of the themes it has chosen. If this methodology works, it can be used to identify 'white space' within all of its themes.

The trustees are now making the final touches to the strategy and, once agreed, they will be able to allocate financial resources to new programmes following this new approach. One key provision is for the creation of the post of Foundation Managing Director to lead the development and implementation of the new strategy against best practice standards. The research themes are outlined below.

HUMAN AND SOCIAL FACTORS



Aim:

To enhance safety performance, design and regulation through understanding of the human dimension

Examples:

- Human factors in design
- Applied ergonomics
- Human-system interface
- Social sciences
- Culture
- Design for operability and maintainability
- Root cause analysis
- Regulation and standards

EMERGENT TECHNOLOGIES



Aim:

To further the application of emerging technologies through systematically examining and fully understanding the risks and safety benefits they represent

Examples:

- Human health, toxicology, epidemiology
- Environmental impact
- Whole life cycle assessment
- Metrology
- Standards
- Nanotechnology, big data, artificial intelligence, space

PUBLIC ENGAGEMENT

SKILLS AND EDUCATION

ACTIVITIES 2012/13

A YEAR OF CONSOLIDATION

The Foundation's activities for funding research and education are well established; it is continuing and building on the work of LRET. In an important move to add to its resources during the year, the Foundation agreed to take over the Lloyd's Register Library, which offers library and research resources to the public and is operated by the Information Centre.

In 2012/13, the Foundation continued the five former LRET grant programmes, which operate on a worldwide basis:

- funding research and development programmes and the creation of centres of excellence at universities worldwide (research)
- funding organisations that inform young people about science, engineering and technology, that encourage them to get involved and inspire them to focus on careers in these fields (pre-university)
- providing scholarships for undergraduate or post-graduate students (university)
- supporting professional institutes and other charities to advance training and professional development (vocational)
- funding programmes which enhance safety on land, in the sea and in the air (safety of life).

A closer look at our activities in 2012/13 under these five categories and on public education and research can be found on the following pages. The Foundation will continue to fund the existing recipients under these programmes for the remainder of their agreements.

The Foundation developed and expanded a small grants programme, formerly operated by LRET. This was for pre-university and vocational schemes which support our objectives and gave us the flexibility to respond quickly to suitable small-scale projects. During the year, we awarded £9,500 under this scheme.

MONITORING THE PROGRAMMES

We need to be sure that we are meeting our objectives through our funding programmes and to be able to show the public benefit of our activity. We ask those applying for funding to show clearly how their projects will benefit the community and align with our objectives. We enter into a formal legal agreement for every programme we support and all recipients of grants have to agree to the Foundation's terms and conditions, which includes our right to audit how our monies are being spent. We require regular reports so we can exercise appropriate oversight and all proposals must include an assessment of how the success or otherwise of the project is measured and how it contributes to society.

We help protect life and property and advance engineering education and research...

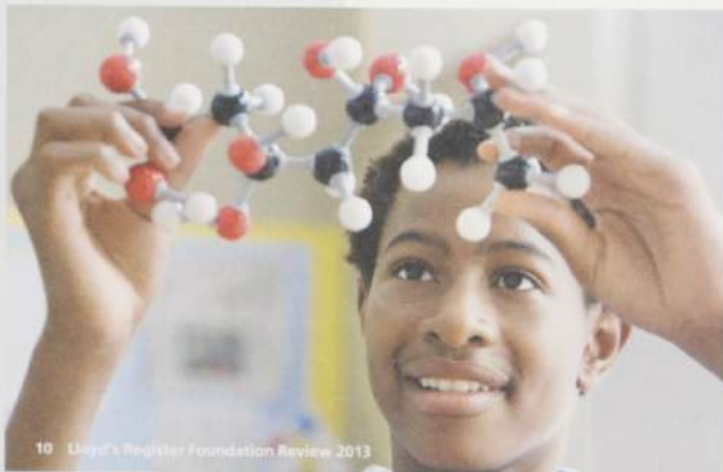
FINDING ANSWERS FOR TOMORROW'S ISSUES

Find out more about our activities in the research category on page 12.



INSPIRING THE NEXT GENERATION

For more about our pre-university education funded activities, see page 14.



LIFE MATTERS

Find out more about our safety of life funded activities on page 19.



ENHANCING PUBLIC UNDERSTANDING IN MARINE AND ENGINEERING SCIENCE AND HISTORY

Find out more about our public education activities on page 20.



HELPING THOSE IN WORK TO ENHANCE THEIR KNOWLEDGE AND SKILLS

Read more about our support for vocational training and professional development on page 18.



...because life matters.



NURTURING EXCEPTIONAL SCHOLARS

Find out more about our university education activities on page 17.

FINDING ANSWERS FOR TOMORROW'S ISSUES

The Foundation's research support is usually in the form of grants to small consortia of universities to support existing or new centres of excellence. This may include specific support for individual academic posts and research staff, but not capital works or major equipment.

Our support, our largest category of funding, is for fundamental research rather than for specific-term projects or product development and is focused on the areas of transportation, science, engineering and technology. The aim is to deliver real and long-lasting benefit to society. Research findings must be made available in the public domain.

We actively encourage international collaboration. The Foundation has inherited a network of research centres of excellence funded by LRET. Six years ago, there were just four and now there are over 40, with a wide geographical spread.

We require particularly detailed reports from our research centres to monitor activity, quality and finances, ensuring that our terms and conditions are met, according to our formal agreement. We are also in touch informally and meet regularly to keep up to date and sometimes to consider opportunities for further collaboration or dissemination.

SETTING THE RESEARCH AGENDA

In 2011, LRET adopted a proactive approach for the 2012/13 funding by identifying research priorities for applicants to address. The third research workshop in September 2012 brought together our research centres, other academics and industry and they collaborated to identify broad themes which present pressing global challenges. From these themes the trustees agreed on four fields: non-carbon energy sources and energy distribution; understanding environmental changes and environmental improvement measures; exploitation of harsh environments; and water and food supply sustainability. Selected universities were invited to submit proposals for the pursuit of fundamental research with the potential to deliver solutions to these challenges; to encourage wider collaboration the call included universities not so far involved in our activities.

The Foundation approved four new programmes in January 2013, one in each field, with funding worth £7.7 million. Each will last five years and all involve small international consortia. The approved programmes are due to start in September 2013:

- LRF Research Centre for Arctic Shipping and Operations (Aalto University, Finland, leading a consortium with Memorial University, Canada; Norwegian University of Science and Technology, Norway; and University of Helsinki, Finland)
- LRF International Institute for Transport and Environment (Dalian University of Technology, China, leading a consortium with University College London, UK; Cornell University, USA; and University of Florida, USA)

LRF RESEARCH WORKSHOP

From 15-18 April 2013, we held a Research Workshop in South Korea hosted by Seoul National University. Some 50 delegates from LRF-funded centres, a small number of other universities and industry, benefited from an intense programme of knowledge sharing and focused discussion about emerging research themes. This networking event is also invaluable to the Foundation in helping us set the specific research themes for the next year.

"I have always been a fan of the LRF Centres meeting as it's the only time when I get to see what the other centres are doing and go away with concrete means of co-operation. It is good this time to see that, in addition to railways, there seems to be scope for applying our research to the maritime sector."

DR ARNAB MAJUMDAR

Director, LRF Transport Risk Management Centre,
Imperial College London

"It was such a pleasure to attend the Workshop. ... I learned as much about HOW to organise similar big projects as I did about WHAT sorts of projects are going on. I know that we have more work to do to try to bring our research programme closer to this largely engineering-orientated community, particularly with respect to data and modelling, but this will come with time. Thanks for all your work in introducing my consortium to the broader LRF community."

DR CHAD STADDON

Director, LRF International Water Security Network,
University of West of England, Bristol

- International Joint Research Centre for the Safety of Nuclear Energy (Lancaster University, UK, leading a consortium with The Open University, UK; Harbin Engineering University, China; and the University of Tennessee, USA)
- LRF International Water Security Network (University of the West of England, UK, leading a consortium with Monash University, South Africa; and AQUASEC IA Centre of Excellence on Water Security, University of Arizona, USA).

The trustees have decided to adopt a thematic approach to future research applications, preferring in general to identify and target research to universities or groups of universities which are world leaders within the fields identified by the Foundation.

DISSEMINATION OF KNOWLEDGE

All our grants are given on the basis that the research findings will be made available to the wider community and the public. However, the Foundation may decide to own any intellectual property which is produced in order to use this to generate further funds for its charitable purposes. The LRF Research Workshop is one of the means we have adopted to disseminate information, as is the series of research collegia, both highlighted on these pages.

All of our research centres publish academic papers, participate in international conferences and seminars, and exploit their academic networks to make known their findings; many publish papers on their websites.

A growing number of centres host an annual lecture on a related topic by a leading expert. During the year, lectures were held at the National University of Singapore, Imperial College London, University of Aberdeen, University of Twente (the Netherlands), University of Western Australia and Shanghai Jiao Tong University. The centres make the lecture content available afterwards in various ways, including videos on their websites.

Our commitment to funding fundamental research programmes will result in long-term benefits to society.

FUTURE PLANS

New research funding will again be proactive, by inviting selected universities around the globe to submit proposals to develop and execute a fundamental research programme, related to the four new strategic themes listed on pages 8 and 9, that will benefit the public at large. To develop the dissemination process, we plan to enrich links on our website to the research findings of our funded programmes. We will be increasing the number of public lectures delivered by our research centres.

The Foundation will continue to fund the multi-year commitments that it has taken over from LRET. Recipients of funding into the future are: Cardiff University, UK; City University London, UK (leading a consortium including Loughborough University, UK; and Technical University of Delft, the Netherlands); Dalhousie University, Canada (leading a consortium including National Oceanography Centre, UK; University of Melbourne, Australia; and University of Sao Paulo, Brazil); Imperial College London, UK; International Joint Research Centre for the Safety of Nuclear Energy; Lancaster University, UK; LRF International Institute for Transport and Environment; LRF International Water Security Network; LRF Research Centre for Arctic Shipping and Operations; Open University, UK with The Welding Institute, UK; Pusan National University, South Korea; National Technical University of Athens, Greece; National University of Singapore; Seoul National University, South Korea;

University College London, UK (leading a consortium including Harbin Engineering University, China; and Shanghai Jiao Tong University, China); University of Aberdeen, UK; University of Nottingham, UK; University of Southampton, UK; University of Twente, the Netherlands (leading a consortium including Technical University of Delft, the Netherlands; and Technical University of Eindhoven, the Netherlands); University of Western Australia.

RESEARCH COLLEGIUM 2013: COASTAL ECO-CITIES

Through our research collegia we bring together academia and industry with the aim of fostering the participants' skills and abilities and developing a professional network of young scholars, while also helping to tackle a topical environmental issue. The Foundation began work on the third in a series of research collegia almost as soon as the last one ended in September 2012. These events are hosted by the University of Southampton, UK, and the Research Collegium 2013 took place from July to September 2013. The theme was coastal eco-cities.

We selected 25 PhD scholars from our funded centres, other universities and industry, representing 16 countries and 20 nationalities. Over eight weeks, they collaborated in small, mixed-discipline groups. Each group produced an academic publication and presented a body of research which could form the basis of future industrial and academic investigation.

The themes of the two previous LRET-funded collegia were sea-bed exploitation and carbon capture and storage in ocean space. The nine research papers from 2011 and 2012 have been published and are available on the University's website. More important perhaps than the findings themselves is the development of individual skills and confidence, and an active community of some 70 PhD and post-doctoral scholars.

"The 2012 Collegium was a genuinely remarkable experience in my career and something I will always cherish. I presented our work again at the Bureau of Meteorology here in Melbourne. It was well received, and incidentally, as an unexpected benefit, it has helped my presentation skills. I am still apprehensive when presenting in person, but to have the opportunity to present the same work three times, once in Southampton and twice here, gives one more confidence and I am very happy with my last talk and looking forward to the next."

WARREN FLENTJE

Research Associate, University of Melbourne,
Collegium participant 2012

INSPIRING THE NEXT GENERATION

We aim to help schoolchildren engage with science, engineering and technology and understand how they contribute to solving many of the critical issues facing the world. We use our funding to help promote understanding of careers in science, engineering and technology to young people, their parents and teachers. We fund national or international programmes, supporting organisations that reach large numbers of children at school level.

During the year, we approved new funding worth £195,000 for The Engineering Link Group in Queensland, Australia, to support expansion of its programmes, both geographically and in content.

To monitor the progress of each programme, all recipients send formal reports to the Foundation. Where possible, we present our prizes at award ceremonies and visit when activities take place to receive feedback from participants, seeing at first hand the enthusiasm and excitement the schemes generate with potential engineers of the future.

FUTURE PLANS

Although many of our current programmes are UK-based, we are interested in identifying good schemes worldwide. All of the schemes currently funded by the Foundation are listed on our website and we plan to add links to the websites of all schemes that we fund.

Recipients of funding into the next year and beyond are: Arkwright Scholarships Trust, UK; CSIRO, Australia; Engineering Development Trust, UK; HELMEPA, Greece; Royal Observatory Greenwich, UK; Scottish Council for Development and Industry, UK; Smallpeice Trust, UK; ss Great Britain Trust, UK; The Engineering Link Group, Australia.

YOUNG ENGINEERS & SCIENCE CLUBS

The Scottish Council for Development and Industry (SCDI) has pioneered the development of Young Engineers & Science Clubs Scotland (YESCS), a network of over 700 clubs with a membership of more than 12,000 girls and boys. The purpose of the programme is to engage young people in practical, exciting, hands-on science and engineering activities.

Seeing the success of the clubs, in 2011/12 we became lead sponsor with a three-year programme of funding. The number of clubs and the reputation of YESCS continue to grow. New initiatives achieved with our funding include an annual lecture, the LRF Eco-ferries School Challenge, new awards and prizes, such as LRF Explorer Reward Experience for the Club of the Year. A website has been set up at www.yescotland.co.uk.

"Thank you for a very valuable and extremely enjoyable tour around Glasgow. We were enthralled by the sheer amount of different places, products and people from the different aspects of engineering. This amazing experience introduced us to many facets of engineering and will motivate us to keep studying STEM subjects throughout our school career and beyond."

MEMBERS OF CLUB OF THE YEAR 2013

[Alness Academy](#)

SCIENCE BY EMAIL

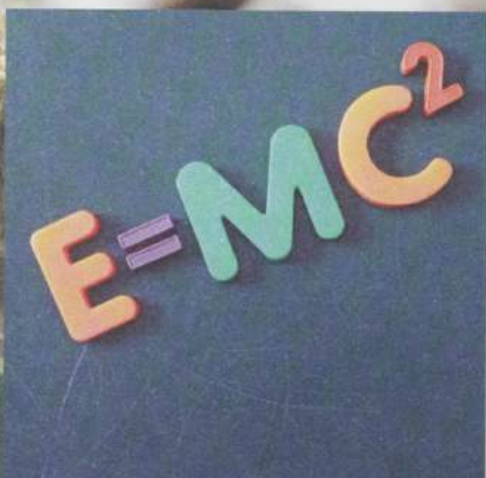
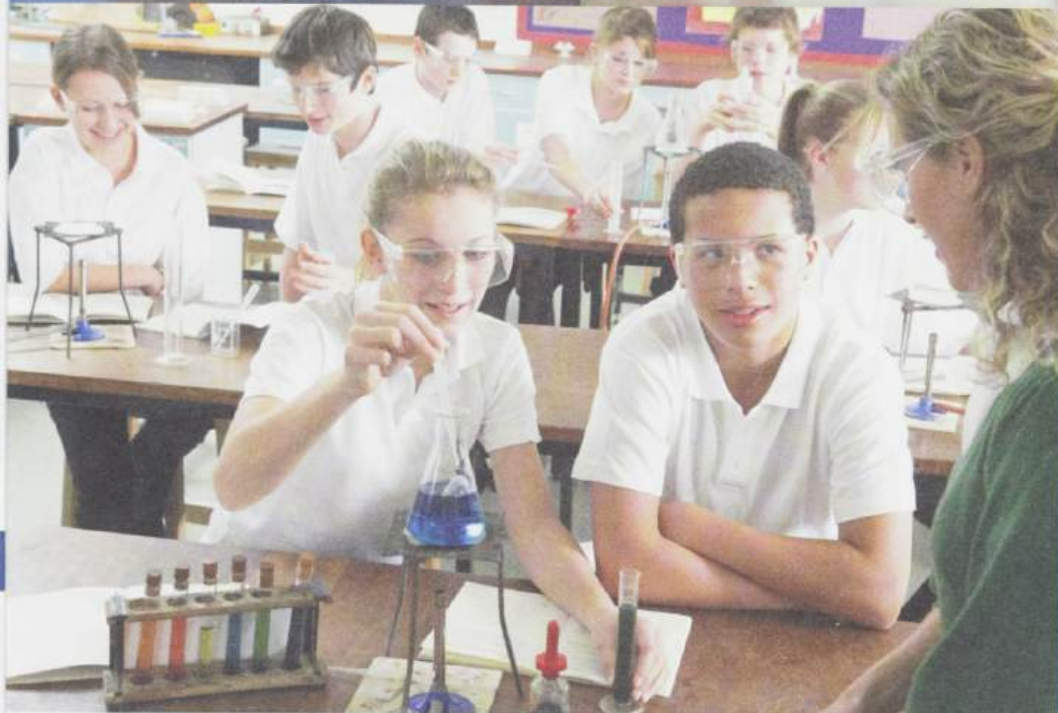
The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is Australia's national science agency, fulfilling its role in education and outreach through CSIRO Education. Science by Email (SbE) communicates the value of science to children aged 9-13, and their parents and teachers through topical science news, facts, and safe and easy experiments, encouraging hands-on learning. Links point to deeper research and new findings.

We recognise the particular value of online tools in reaching remoter regions of Australia. CSIRO's report in April 2013, after our first year of funding, shows a monthly subscription rate of over 200. Content ranges across physical, chemical, earth and biological sciences, psychology, engineering and technology.

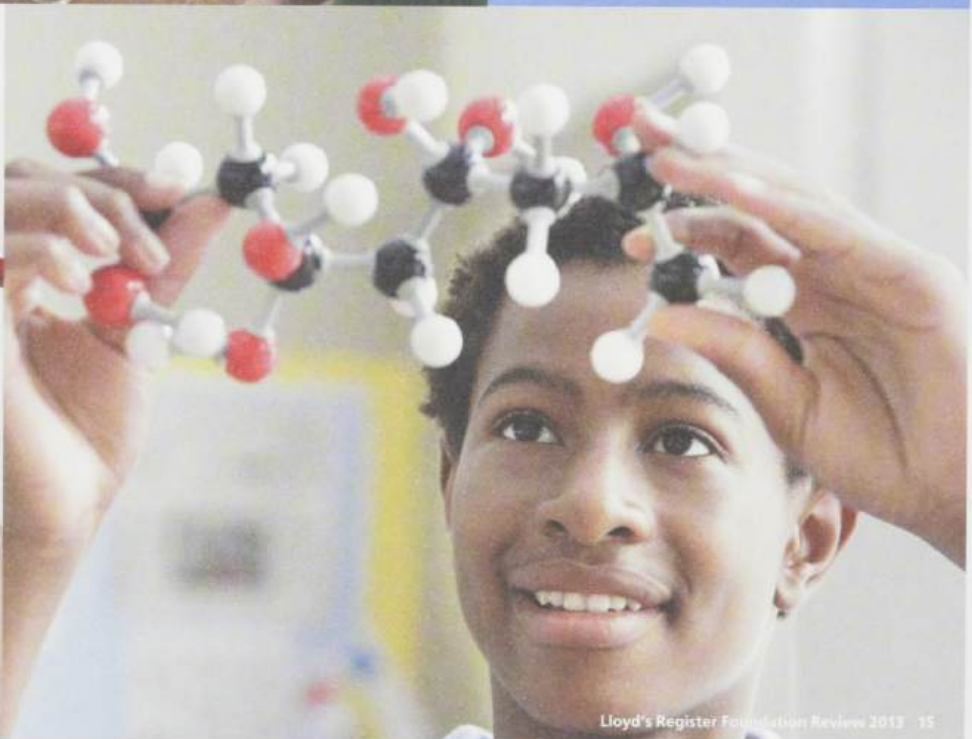
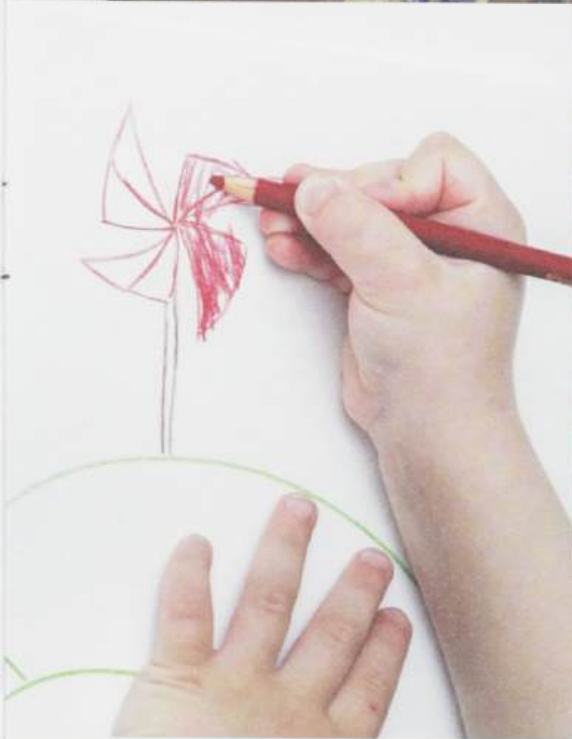
"CSIRO and LRF share a common aim of promoting science awareness amongst school-aged students, their teachers and carers. The generous sponsorship by LRF this year has supported the continued production of Science by Email to the highest standards, and at no cost to well over 41,000 readers. It has been a great experience partnering with LRF. As our first international sponsor, LRF has inspired a greater focus on global science content, attracting readers from all over the world."

KATE LIST

Editor of Science by Email, CSIRO



Engaging young minds
with science, engineering
and technology.





We hope our scholars will be future leaders
in their field of expertise.



NURTURING EXCEPTIONAL SCHOLARS

In this category we concentrate support on the provision of scholarships and bursaries to students of exceptional ability at first degree or masters level in engineering, science and technology. Our aim is to support students who have the potential to become leaders in their chosen field.

Awards made through the universities who administer the schemes on our behalf but the Foundation is involved in the selection process. Scholarships are typically awarded for high grade achievements in the first undergraduate year or a first class honours degree. Our agreement sets out the terms of the scholarships including definition of the applicable courses, the maximum award level, and specific conditions and the period of the awards.

We ask students to demonstrate their commitment and performance, based upon assessments and results. We ask them to send an email, at least twice a semester, with updates on their academic achievements, activities and extra-curricular activities. Every six months we ask the students to send formal reports including their plans and goals for the future. We try to meet as many of our scholars as possible. Through these channels we can offer support to the students. As well as these formal and informal reports from the students, the Foundation requires an annual report from the university on each scholar's progress.

During the past year, we have increased our support in this category and now fund scholarships in several new countries and for a wider range of science and engineering disciplines.

FUTURE PLANS

We encourage students to keep in touch after their scholarship ends. We plan to build a worldwide community of Foundation scholars, including through social media channels, to help us to track their progress and to create a network where they develop working relationships. The Research Collegium already helps to foster future collaboration and building this community will develop this further.

Recipients of funding into the future include: Arkwright Scholarships Trust, UK; Bremerhaven University, Germany; Dalian University of Technology, China; Harbin Engineering University, China; Dalian Maritime University, China; EMSHIP, Belgium; Huazhong University of Science & Technology, China; International Maritime Law Institute, Malta; Jiangsu University of Science & Technology, China; Kazakh-British Technical University, Kazakhstan; Nanyang Technological University, Singapore; National Technical University of Athens, Greece; Rice University, USA; SET Awards, UK; Shanghai Jiao Tong University, China; Shanghai Maritime University, China; Singapore Maritime Foundation; Stevens Institute of Technology, USA; Tolani Maritime Institute, India; Union of Greek Shipowners, Greece; University College London, UK; University of Edinburgh, UK; University of Glasgow, UK; University of Strathclyde, UK; World Maritime University, Sweden; Wuhan University of Science & Technology, China.

KAZAKH BRITISH TECHNICAL UNIVERSITY, KAZAKHSTAN

We are funding 12 scholarships for undergraduates in petroleum engineering or chemical engineering, over three years. The first scholarships were awarded in 2012. Nine of the scholars, chosen on academic merit and leadership ability, are women. All are enthusiastic and committed to their studies in the energy sector which is very important in the region. Fourth year scholars have had internships in the Karakuduk oil field, while second and third years have taken part in national competitions.

"I'm really proud of being an LRF scholar. I will do all my best in order to achieve my aims and aspiration and I'm convinced that this scholarship is really necessary financial support for my studying and education."

MARIYAM BAYAZOVA

Fourth year scholar

"Hello! I'm Sagynkul Yerimbekova, LRF scholarship recipient. I am a second year student of chemical engineering. Recently, on November 3, we participated in the intellectual game, ChemIntel, which was held in Kazakh-British Technical University. There were 19 teams of Almaty universities. Having passed three rounds, we were awarded the cup, the diploma of the first degree and valuable prizes. The game was very intense and interesting. We tested our strength, showing our knowledge in chemistry and petrochemistry. I really want to become the best specialist of oil processing and petrochemical industries."

SAGYNKUL YERKIMBEKOVA

LRF scholarship recipient

HELPING THOSE IN WORK TO ENHANCE THEIR KNOWLEDGE AND SKILLS

We support educational and training establishments and institutions that provide vocational training and professional development. The programme is focused on enhancing the level of knowledge and understanding of the target group for the benefit of the public through education or training, in the fields of transportation, science, engineering and technology.

In the professional development field, our funding is aimed at providing high-quality lectures and courses, fulfilling the need for continuing professional development and for specific educational effort in the above subjects. Support is extended to major public educational facilities and initiatives. The aim of the programme must be to provide an educational resource of wide accessibility to fulfil a perceived need.

During the year, we approved funding worth nearly £55,000 over three years for a new initiative by The Welding Institute, UK. Our support will further develop The Welding Apprentice Group Training Scheme pilot in the East of England to secure SME investment in apprenticeships, and collaboration with training colleges to ensure the right skills are taught. LRF sponsorship will produce up to 10 accredited welding technicians, meeting industry needs and contributing to the success of engineering in England.

The establishments send formal annual reports each year. We participate in events and make personal visits to our programmes for regular updates on progress.

FUTURE PLANS

Recipients of funding into the future include: Maritime London Officer Cadet Scholarships, UK; Royal Academy of Engineering, UK; Royal Institution of Naval Architects, UK; The Foundation for Science and Technology, UK; University of Edinburgh, UK; World Maritime University, Sweden; The Welding Institute, UK.

NATIONAL SKILLS ACADEMY FOR RAILWAY ENGINEERING

We are in our third and final year of funding the post of Head of Training and Skills at National Skills Academy for Railway Engineering (NSARE) in the UK. Our involvement in development skills specific to railway engineering began in 2009. Appreciating a real need to establish a national skills academy for this sector, LRET made a financial contribution to the Railway Industry Association in 2010. The initiative was backed by industry and government. NSARE was launched in December 2010.

NSARE's successes to date include work with Derby College on professional skills training; the takeover and development of the Railway Training Accreditation Scheme; and a national skills directory and national competency database and skills passport. By the year ending December 2012, 2,000 apprentices had started in the rail industry. NSARE also works with another Foundation beneficiary, the Smallpeice Trust, on introducing railway engineering to school students through residential courses. A major piece of work on skills forecasting culminated in a publication in early 2013. Now NSARE is one of the leading national skills academies in the UK.



LIFE MATTERS

In 2012, we introduced a category of support aimed at organisations carrying out programmes which enhance safety on land, in the sea and in the air. This is closely allied to the vocational training category. The programmes are focused on enhancing the effective management or regulation of safety in its widest sense, in the application of transportation, science, engineering and technology. Mainly, to date, we have funded schemes of organisations actively involved with ensuring the safety of life and property.

Recipients send formal annual reports each year. As with all our programmes, we keep in personal contact throughout the year and, where possible, attend events.

During the year, we approved funding worth £60,000 to continue supporting the Confidential Hazardous Incident Reporting Programme (CHIRP) for Maritime for a further three years. CHIRP Maritime provides a system in which mariners worldwide can report near misses or safety issues in complete confidence. It then follows up the matter with the company concerned – or the authorities – without disclosing the identity of the reporter, with the explicit aim of improving maritime safety.

FUTURE PLANS

Recipients of funding into the future include: Confidential Hazardous Incident Reporting Programme (CHIRP), UK; Nautical Institute, UK; Royal National Lifeboat Institution, UK.

ROYAL NATIONAL LIFEBOAT INSTITUTION

LRET had an association with the UK's Royal National Lifeboat Institution (RNLI) for five years and now we support the sea survival and fire fighting elements of the training for volunteer crews as part of a five-year programme funding, which began in 2011. With over 4,500 volunteer crew members across the British Isles, the RNLI needs to ensure that their knowledge and skills are up to date and regularly refreshed, so that they stay safe and can save the lives of others at sea. Training is carried out at RNLI's dedicated training college in Poole, Dorset. Over 280 crew members are trained each year, fully funded by the Foundation.

"As well as being the Lifeboat Training Manager at the RNLI College, I am also a coxswain at Poole Lifeboat Station and I can see the impact this course has on the new volunteer crew members. It is clear that they gain knowledge and skills, but also have confidence in their own ability after receiving quality training at the college. Thank you for your support."

GLEN MALLEN

Lifeboat Training Manager



ENHANCING PUBLIC UNDERSTANDING IN MARINE AND ENGINEERING SCIENCE AND HISTORY

In February 2013, the Foundation agreed to take over ownership of the assets of the Lloyd's Register Library and archive from Lloyd's Register Group Limited as part of its public education objective. This collection is operated by a specialist Information Centre.

The Information Centre based in London is one of the finest archives of its kind, holding material concerning 253 years of marine and engineering science and history. Its aim is to enhance public understanding in these areas, encourage and support current research and to assist with research concerning the history and development of the Group globally.

The library includes the historic collection of the Institute of Marine Engineering, Science and Technology (IMarEST) and now contains in excess of 54,000 items. It is one of the great resources still available for current and historic information concerning maritime history, marine engineering, naval architecture, offshore engineering and ocean technology, offering resources freely to those undertaking research.

RESEARCH RESOURCES

The archive collection, built up over many decades, provides a unique resource and insight into the development of classification and the wider marine and engineering industry. The centre is open to the public in office hours and receives queries from business, students, academia, institutions and members of the general public. Resources are often used to support TV documentaries and authors, helping to widen maritime engineering and scientific knowledge.

The work involves cataloguing, preserving, scanning and expanding the archive and library collections to ensure that the material is available and future proof. The centre is currently upgrading the online library catalogue to improve global accessibility and to ensure it holds details of all the research funded by the Foundation.

Another resource being prepared for researchers is an enhanced database which individually lists all of the ships as recorded in the Register Book for 1764-66. A project to preserve and digitise the world fleet statistics has been completed and the next stage in the plan is to add these statistical resources to the website. Further digitisation of Register Books that are not currently available is under investigation.

ADVANCING EDUCATION

The centre combines historical research with current information to produce articles, briefing notes, presentations and factsheets for public benefit. The Information Centre also hosts the annual Proctor Memorial Lecture.

The centre takes part in educational visits from many European universities, providing education and information on Lloyd's Register's research and development and the business in which it works, to encourage careers in engineering and the marine field. Its services are a fusion of the past and present, expanding knowledge of the value of Lloyd's Register's unique history for the public benefit, while helping to educate, encourage and inspire the future generation of industry experts.

Universities, colleges and institutes that visit each year for training lectures include: Erasmus University, Rotterdam (law students); Ghent University (Maritime Institute – Master in Maritime Sciences); HSBA Hamburg School of Business Administration; Instituto Marítimo



Espanol, Madrid; Staatliche Handelsschule Berliner Tor, Hamburg (German shipbrokers); Texas A & M University at Galveston; University of Barcelona (Masters in Shipping Administration); University of Cadiz; University of Deusto (Bilbao); Valenciaport Fundaci3n; and Yokohama National University.

The centre also gives tours, lectures and hosts visits for research groups, government groups, charities and other organisations. Groups visiting the Information Centre have included: delegations from shipyards, institutes and rail groups from China, Korea, Japan and Taiwan; government ministers from China, Korea and Taiwan (ambassador); maritime authorities; summer interns, graduates and work experience students; Arkwright Scholarship; Bristol University; China Classification Society; City of London Tourist Guides; Energy and Environment Workshop; Guildhall Library; IHS-Fairplay; Institute of Chartered Shipbrokers; Institute of Marine Engineering, Science & Technology (IMarEST); Korea Maritime Institute; LRET Research Collegium; LRET Scholars; Matsumoto Shuko High School (Japan); Sailors' Society; Singapore Foundation Scholars; University of Edinburgh MEng and Masters in Fire Safety Engineering; Young Engineers; and Wigmore Hall.

FUTURE PLANS

The archive and library provides a potentially rich source for mapping and analysing patterns of seaborne trade, the development of ship-building, and advances in marine and engineering research from the 18th century. Prospective research could draw on a range of disciplinary approaches, enabling better understanding of how world shipping changed in response to different external influences. The team has a plan to further expand digital access to records that have received positive feedback from the public, students and academics.

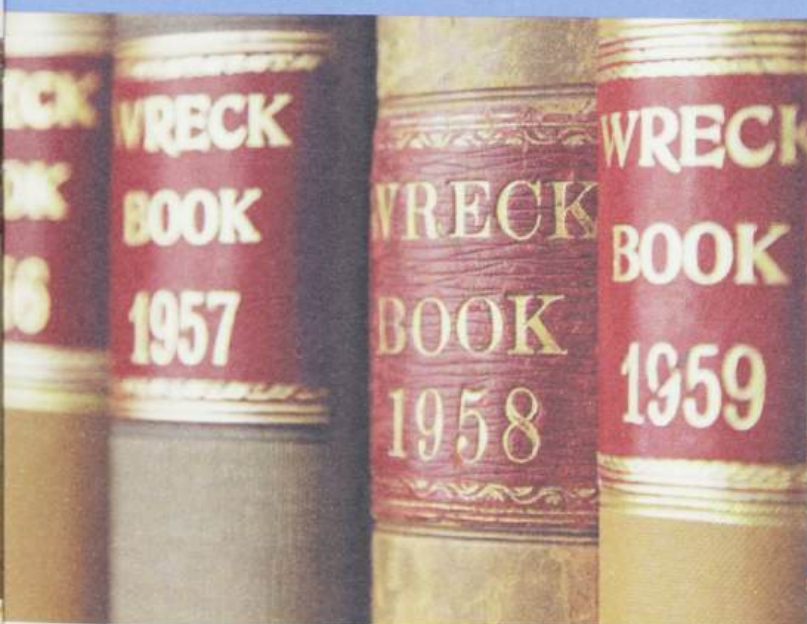
The centre is working on collaborative opportunities with the Southampton Marine and Maritime Institute (SMMI), University of Southampton, on projects involving the Faculty of Humanities, in particular the History Department. Future scope for projects that utilise the diverse and unique archive and library collections could involve many disciplines across the university, particularly in politics, management, economics and geography. Students can already make full use of the wealth of archival and library resources, as well as benefiting from the experience and expertise of the Information Centre staff and discussions are under way, on research projects to support PhD dissertations.

The staff of the Information Centre are presently researching for a paper on the history of the Safety of Life at Sea (SOLAS) Convention.

The centre has already worked with the Naval Maritime Libraries and Archives Group, the International Council of Archives, the Maritime Information Association, British Commission for Maritime History, Society for Nautical Research, and the City Archives Group. Its aim is to broaden interaction with other associations, libraries, museums and archives globally. This will be a mutually beneficial programme to enhance the exchange of knowledge and to open up collaborative research opportunities. Activities could include joint conferences and seminars, a series of research visits, exchange of specialist collection catalogue data, and creating a clearer network of information providers in the specialist engineering and maritime research field.

The centre's database development programme seeks to widen access to our resources by enhancing the search functionality and making new material accessible globally.

Enhancing public understanding and research.





Lloyd's Register
Foundation

Life matters

Innovation drawn from our heritage

We are changing our logo. In moving forward we have taken inspiration from our heritage. Since 1884 our surveyors have stamped the letters 'LR' into steel as proof of approval and we have drawn on this stamp to arrive at our new logo.

Lloyd's Register has undergone significant change and growth. Our new identity reflects our commitment to independence, technical excellence and customer service. And the new logo is a device that can link together all the members in our organisation.

Lloyd's Register Foundation

T +44 (0)20 7709 9166
F +44 (0)20 7488 4796
E lret@lr.org

71 Fenchurch Street
London
EC3M 4BS
UK

Copyright ©Lloyd's Register Foundation, 2013.

Lloyd's Register Foundation (Reg. No. 1145988) is a Charity registered in England and Wales, and owner of the Lloyd's Register group.

Registered Office: 71 Fenchurch Street, London, EC3M 4BS, United Kingdom.

Produced by Lloyd's Register Group Communications
Designed by **CONRAN DESIGN GROUP**
Printed by Pureprint

