

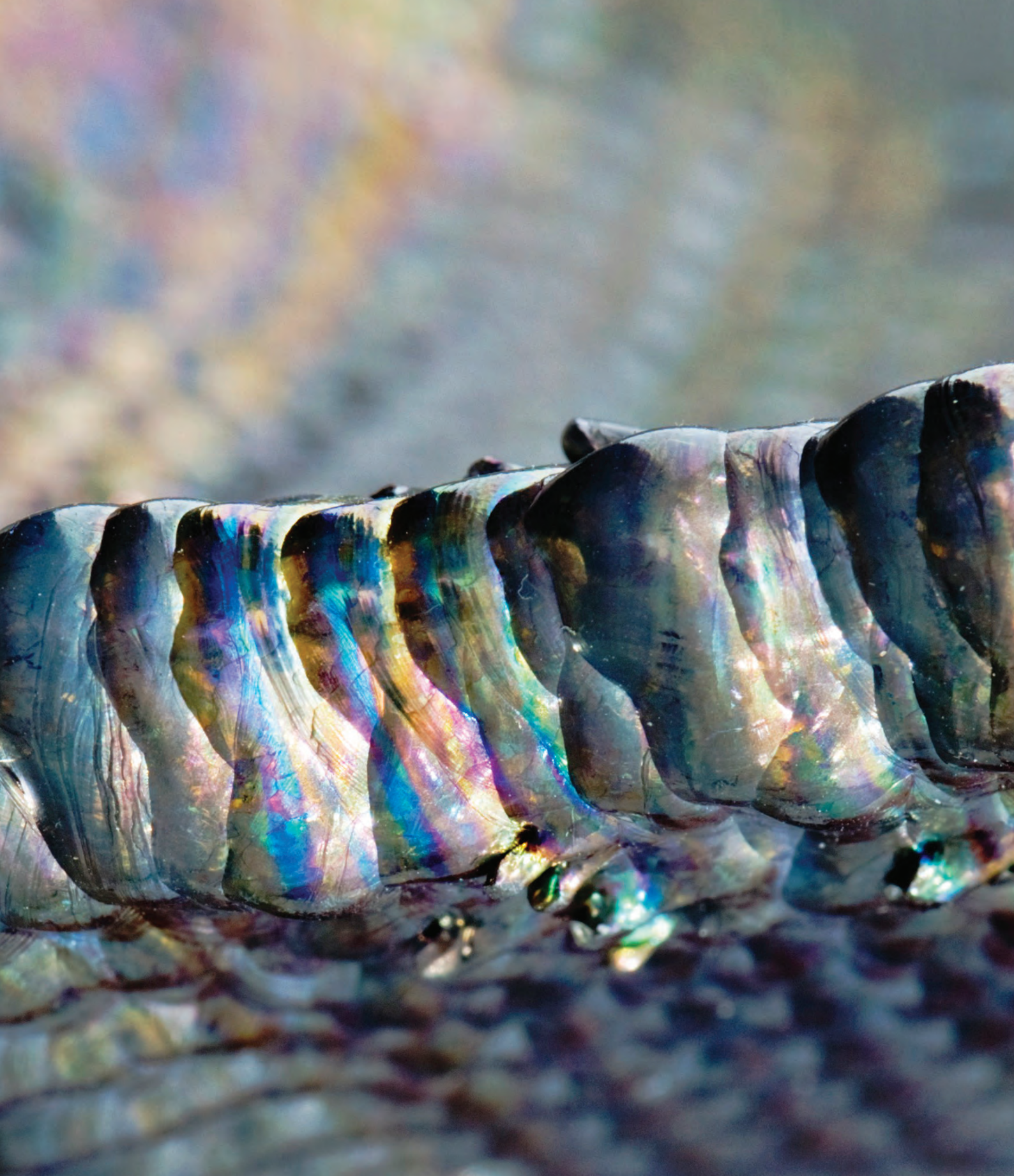
It all adds up.

Our year in review 2017



Lloyd's Register
Foundation





A detail of part of a complex fan blade fabricated using a wire and arc additive manufacturing process (WAAM), which deposits layers of metal from a wire in a technique derived from welding.

Optical interference patterns, as a result of surface oxides, produce the iridescent colours.

Photographed at Cranfield University, UK.

Credit: James King-Holmes/Science Photo Library

A journey from data to ambassadors

2016

July 2016

Grant: Our Lives in Data

The start of a 15 month long exhibition at the Science Museum about how big data is transforming the world around us. £250k. See page 22.

November 2016

Grant: Design for safety at sea

An exhibition by the Royal College of Art showcased the outcomes of the global safety challenge pilot. £20k. See page 22.

First workshop on data-centric engineering

The Alan Turing Institute hosted a week-long event bringing together researchers and industry to work on real data science problems posed by industry.

October 2016

First international conference

We held a two-day conference, 'Bringing safety to life' in London. See page 18.

Five year plan 2016-2021 published

The seven goals in our new five year plan articulate our focus and priorities. See page 5.

Roadmap for additive manufacturing published

The ultimate aim of this roadmap is the safe adoption of additive manufacturing to safety critical assets. See page 9.

Grant: Global safety challenges

Nesta's Challenge Prize Centre carried out activities to identify, prioritise and recommend solutions to address the greatest risks to safety related to the critical infrastructure on which society relies. £90k. See page 18.

December 2016

Grant: The Ri Christmas Lectures

We supported the Royal Institution's (Ri) lecture series on the theme of energy storage. £102k. See page 23.

Grant: Internet of Things (IoT) resilience

PETRAS, the UK research hub for cybersecurity of the internet of things, has initiated a broad spectrum of projects. £250k. See page 14.



2017

April 2017

Event: ICON Conference 2017

The conference provided an opportunity for the ICON network to come together to consider the grand challenges in nanotechnology. See page 10.

Networking: First 100A1 ceremony dinner

To mark the launch of the 100A1 Ambassador programme. See page 25.

February 2017

Grant: A smarter bridge

MX3D are leading a consortium to build the world's first 3-D printed steel bridge. £247k. See page 14.

March 2017

Independent evaluation: NPC

NPC completed an independent evaluation of our impact. See page 12.

Workshops: Robotics and autonomous systems

Workshops held to develop priority areas identified in our foresight review. See page 14.

Extended grant: IMLI, Malta

We extended our grant with the International Maritime Law Institute providing scholarship funding for three candidates per year within the Institute's Master of Laws (LL.M.) programme. £82k. See page 22.

January 2017

Grant: Maritime education in Greece

Funding for the Merchant Marine Academies Support Upgrade Plan of the SYN-ENOSIS Greek Shipowners Social Welfare Company. £900K.

Lead appointed for the data-centric engineering programme

Professor Mark Girolami FRSE was appointed to lead The Alan Turing Institute-Lloyd's Register Foundation £10 million programme into data-centric engineering. See page 11.

Grant: Global safety outlook

Polecat Intelligence Ltd. UK will deliver a foresight review based on expert engagement about the availability and nature of global safety data. £100k. See page 18.

It all adds up.

The Lloyd's Register Foundation is a charity that helps to protect life and property and support education, engineering-related research and public engagement.

Our vision is to be known worldwide as a leading supporter of research, training and education – relevant to the field of engineering – which makes a real difference in improving the safety of the critical infrastructure that is vital to modern society.

To support this, we promote scientific excellence and act as a catalyst working with others - **it all adds up to maximum impact.**



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2016/17 - a year in numbers

102

approaches for funding received (outline proposals and applications)

46%

of new awards were 'directive', led by the Foundation: 54% 'responsive', as a result of unsolicited approaches

£40m

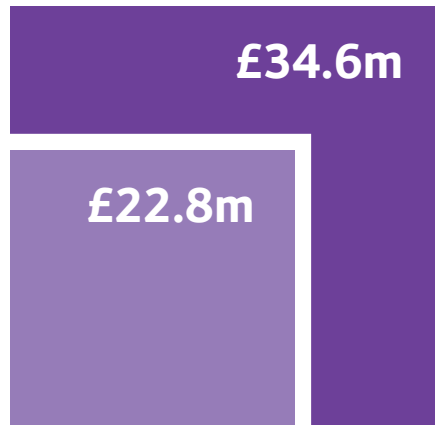
reinvested in the share capital of Lloyd's Register Group Ltd. to fund the acquisition of Acoura in the field of food safety assurance, in line with the Foundation's charitable purpose

21

grants awarded in year

Value of grants awarded

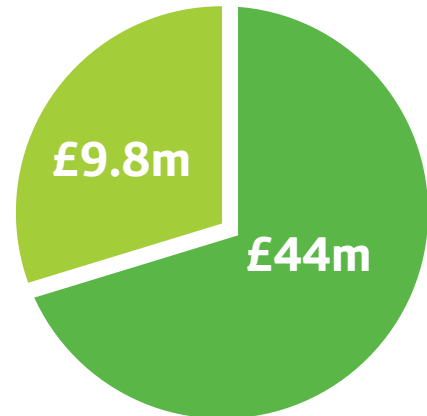
= **£22.8m**



■ 2015/16
■ 2016/17

Foundation income by source 2016/17

£53.8m

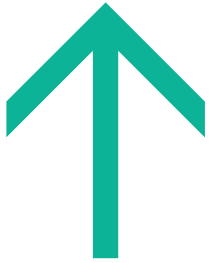


■ Trading group income
■ Listed investments

Funding by strategic theme

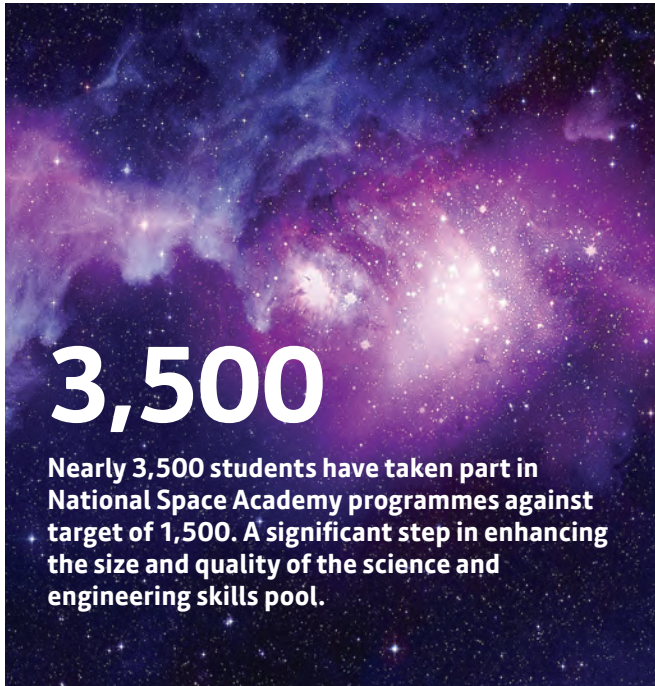
	Supporting excellent scientific research	Accelerating the application of research	Promoting safety and public understanding of risk	Advancement of skills and education
21 new awards £22.8m	4 awarded in year, value £10.2m	5 awarded in year, value £11.14m	2 awarded in year, value £0.19m	10 awarded in year, value £1.28m
Active grants portfolio at 30 June 2017 £100.36m	25 grants, value £61.49m	7 grants, value £21.2m	9 grants, value £11.65m	36 grants, value £6.02m

Adding up to maximum impact



23

Our grants reach 23 countries

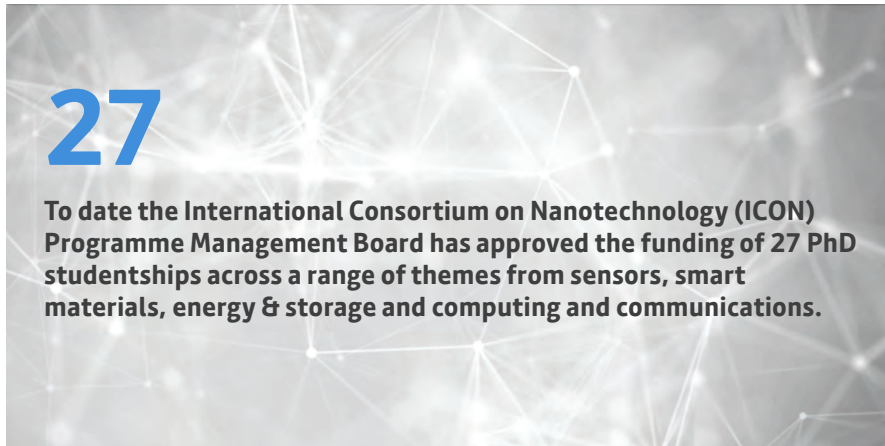


3,500

Nearly 3,500 students have taken part in National Space Academy programmes against target of 1,500. A significant step in enhancing the size and quality of the science and engineering skills pool.

**122
from
36**

Our research grants supported 122 PhD students of 36 nationalities.



27

To date the International Consortium on Nanotechnology (ICON) Programme Management Board has approved the funding of 27 PhD studentships across a range of themes from sensors, smart materials, energy & storage and computing and communications.

Foresight reviews

1,025

downloads

3,500

printed copies distributed

**1.3m
visitors**

Our Lives in Data at the Science Museum, London, attracted around 100k visitors per month during its 15-month run, putting the total number of visitors to the exhibition at about 1.3 million.

**1.7m
viewers**

Over 1.7 million viewers of the 2016 Royal Institution Christmas Lectures on BBC Four; and over 3.5 million interactions through broadcast, theatre attendees and social media.

Building outreach

459,666

total social media impressions

Chairman's statement

One charity + four strategic themes = benefit to society.



We are particularly proud of our achievements and impact this year.

Thomas Thune Andersen
Chairman, Lloyd's Register Foundation



We are particularly proud of the achievements and impact that the Lloyd's Register Foundation (the Foundation) has made this year. Now in our fourth full year, the 2014-2020 funding strategy that we set out at our formation continues to guide our grant giving and has delivered a strong set of charitable activities across our four strategic themes.

Those themes remain as important as ever. Fundamental scientific research is at the heart of what we do – we are committed to furthering society's understanding of the safety and environmental impact of new technologies. Our body of work in the areas of energy storage, nanotechnology, robotics and autonomous systems, additive manufacturing, data-centric engineering and blockchain technology, to name a few, is starting to make a real difference in improving the safety of the critical infrastructure on which society relies. The acceleration of that fundamental research into practical application is another priority and we are starting to see a number of our early grants deliver real impact.

Our fourth theme, promoting the advancement of skills and education, is particularly important for the Foundation. Inspiring and supporting the next generation of engineers and scientists,

especially those from under-represented and disadvantaged communities, is vital in meeting the challenges and opportunities of the fourth industrial revolution. It is probably the most exciting time since the first industrial revolution to embark on a career in science and engineering and I am encouraged to see young people wanting to make a difference to society through actively engaging in STEM subjects (science, technology, engineering and mathematics).

Importantly, our updated five-year plan has given the Foundation focus on seven goals: establishing a global safety evidence base; launching a global safety challenges project; portfolio growth; increased focus on skills, education and public understanding of risk; progressing the activities of the Heritage and Education Centre; efficiency and effectiveness; and working with the Lloyd's Register group as a whole for the benefit of society. These seven goals to achieve in five years articulate our focus and will be reviewed and refreshed annually to factor in experience and new opportunities.

The impact that the Foundation makes could not be possible without the contribution and funding from our Trading Group, Lloyd's Register Group Limited (LRG). Established in 1760 as a not-for-profit safety body, it has evolved into the 21st century model for social business – not only funding the Foundation through its profits, but also discharging some of the Foundation's charitable objectives through its work in assuring the safety of critical infrastructure worldwide.

The Foundation's income this year from the trading activities of the Lloyd's Register group (the Trading Group), was £44 million. Grant expenditure by the Foundation in the year was £22.8 million, bringing the value of the active grants portfolio to now just over £100 million. In addition this year, the Foundation reinvested £40 million in the share capital of LRG to fund acquisitions, including that of Acoura in the field of food safety assurance. This further strengthens our impact inline with the Foundation's charitable purpose, and exemplifies the ways in which the Foundation and LRG work together for a safer world.

This year has also seen a focus on charities' responsible investment policies. In addition to performance and governance, the Trustees

included social, environment and ethical considerations when selecting investment managers to oversee our investment portfolio. Both investment managers, Sarasin and Fidelity, are signatories to the United Nations Principles for Responsible Investment (UNPRI). UNPRI works to understand the investment implications of environmental, social and governance factors and supports its international network of investor signatories in incorporating these factors into their investment and ownership decisions. The Trustees are also considering ways to augment the Foundation's reporting on its charitable impact by including the social impacts of underlying investments within the Foundation's portfolio.

On behalf of the Foundation, I would like to thank my fellow Trustees for their ongoing support, time and expertise in guiding the Foundation. We also thank our Advisory Council members and the newly established 100A1 Ambassadors. They all give their time freely, and are hugely passionate about the Foundation's purpose and impact.

Finally, we would like to extend our warmest thanks to Professor Richard Clegg, Foundation Chief Executive, Michelle Davies, Secretary of the Foundation, and the Foundation staff. With only 17 dedicated employees, the Foundation is now truly making an impact, and we are very proud of their contribution.

Foundation Chief Executive's review

'Impact' sums up our year.



Everything we do is directed at making an impact in line with our charitable purpose.

Richard Clegg
Foundation Chief Executive



If I had to sum up 2016/17 in one word, it would be 'impact'. Everything we do, the grants we give and all the direct charitable work we undertake is directed at making an impact in line with our charitable purpose.

We are a relatively young charity, having been in full operation now for just under four years. In that time, we have built up an expanding grants portfolio in line with our published strategy. Some of these grants involve long-term commitments, with horizons extending to 10 years; aimed at building relevant capabilities that can tackle some of the major safety-related challenges facing society. With impact in mind we strive to ensure that everything we fund and undertake is end-user inspired, with a plausible pathway to application from the outset. In 2016/17 we have worked hard, both to extend the size of the grants portfolio and to leverage greater impact from it by promoting interactions and cross-working between our grant holders.

Before covering the new commitments we have entered into it is worthwhile reminding ourselves of the journey so far to provide context for our ongoing work.

We have previously reported on numerous large long-term grant clusters which, because of their long horizons, we manage in parallel to our current portfolio of live grants. Examples include grants to date in fields such as nanotechnology (led by Cambridge, Southampton and Manchester universities); resilience engineering (led by Arup); data-centric engineering (led by The Alan Turing Institute); structural integrity and systems performance (through the National Structural Integrity Research Centre led by TWI in the UK); and the public understanding of risk (in collaboration with the National University of Singapore). Based on our five-year plan, we forecast that our live grants portfolio will grow to around £150 million as the Foundation ramps up its activities.

Our charitable expenditure for 2016/17 in terms of grants awarded plus direct charitable activities was £23.5 million, equating to 43.7% of total incoming resources. We awarded a total of 21 grants in the year broadly split 50:50 in value terms between responsive and directive modes. I believe this demonstrates the Foundation's agility in identifying and investing in innovative ideas as they appear on the horizon. The major grants

included £10 million to a consortium with the UK Health and Safety Executive and the University of Manchester on extracting knowledge from the world's safety databases and a £10 million grant to the University of York to lead an international programme on robotics and autonomous systems (building on the foresight review we published in October 2016). We are also pleased to have sponsored the UK Royal Institution Christmas Lectures with a grant of £102,000 as part of our aim of inspiring the next generation into STEM subjects. The lectures, delivered by Professor Saiful Islam of the University of Bath, were broadcast by the BBC to an estimated total audience of over 1.7 million viewers on the subject of 'Fuelling the Future'.

As our grants portfolio and impact increases, resourcing remains a key challenge in terms of making sure that we have an in-house team of the right size and skills composition to efficiently and effectively manage the Foundation's workload. Therefore a key event for us this year has been the appointment of Dr Tim Slingsby as Director of Skills and Education. One of his first steps has been to successfully update our strategic priorities in the skills and education area, which were approved by the Foundation's Board

of Trustees in March 2017. This involves exciting plans for the future of the 257 year-old heritage collection, named Project Undaunted, which is conserving, cataloging and digitising the collection and putting it to work as a unique educational and historic resource. I look forward to reporting big strides in this area in subsequent annual reviews, and to developing the skills and education area so that it is on a par with the progress we have already made in the scientific research element of our strategy.

I mentioned in last year's review that our relationship with the Lloyd's Register group is a distinguishing feature of the Foundation in working together for a safer world. In addition to providing income, the Lloyd's Register group also provides us with an invaluable real-world perspective on industrial challenges facing the sectors we serve. We have worked hard in 2016/17 on maximising the synergies between the two branches of our organisation, helping to identify priority areas in which to invest where we can make a distinctive difference and accelerating the uptake and application of results. We look forward to continuously strengthening and leveraging this relationship.

In closing, I would like to return to the theme of impact. I want to thank the Foundation team for all the practical work they have done behind the scenes on developing our impact framework. This has helped us to define, for our purposes, what impact means and the metrics and indicators we will use. We have issued this as a guidance note for grant applicants via our online grants portal and shared it with the Foundation's Trustees; so that we all now share a common vocabulary and understanding. You will find that the content of this annual review is structured along the lines of our impact framework looking at outputs, outcomes and impact.

Finally, I want to thank our Advisory Council members as well as our 100A1 Ambassadors who we appointed this year. The success of the Foundation belongs to all of them, as well as our grants community and our colleagues and friends in the Lloyd's Register group.

Mission, vision, strategy

Our mission

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, on land and in the air.

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

Our vision

Our vision is to be known worldwide as a leading supporter of engineering-related research, training and education that makes a real difference in improving the safety of the critical infrastructure on which modern society relies. In support of this, we promote scientific excellence and act as a catalyst working with others to achieve maximum impact.

Strategic themes and objectives

1 Supporting excellent scientific research

- Striving for excellence and impact
- Promoting technology foresight
- Building world-class research teams

For 2016/17 activities and impact see page 8

2 Accelerating the application of research

- Accelerating technology uptake
- Informing standards and policy
- Facilitating the mobility of researchers

For 2016/17 activities and impact see page 12

3 Promoting safety and public understanding of risk

- Promoting the safety of life, property and the environment
- Enhancing public understanding of risk
- Maintaining and promoting a memory bank of safety and risk management developments

For 2016/17 activities and impact see page 16

4 Promoting advancement of skills and education

- Inspiring the next generation
- Enhancing the knowledge and skills of the workforce
- Widening access to disadvantaged and under-represented communities

For 2016/17 activities and impact see page 20



Scientific evidence drives our safety mission

Progress on what we set out to achieve

Last year we set out our plans for 2016/17. These included publishing several foresight reviews on global safety knowledge, analytics and data; robotics and autonomous systems; and energy storage. We said we would run a campaign to identify the major global challenges and opportunities for the safety of life and property and publish a roadmap on the safety of additive manufacturing, following the recommendations from the foresight review on structural integrity and systems performance.

We have made good progress against these plans. Professor David Lane launched the Foresight review of robotics and autonomous systems at the Foundation's

international conference in October 2016. More information on the next steps we have taken is given in the section looking at the theme of accelerating the application of research, see page 14.

The Foundation asked NESTA (the UK based National Endowment for Science, Technology and the Arts) to work with us in identifying global safety challenges. This campaign was also launched at the Foundation's conference in October 2016. Work on this and the review on global safety knowledge, analytics and data, has matured into activity now included under our third strategic theme, promoting safety and the public understanding of risk; see page 18.



Our foresight reviews show us where we can act distinctively.

Jan Przydatek
Associate Director of Programmes



Promoting scientific foresight

The foresight review process continues to be an excellent model for bringing together experts to explain a subject for the public and highlight the threats and opportunities associated with the topic.

We published two foresight reviews during the year and a consultation draft roadmap.

Foresight review of robotics and autonomous systems

The review explores how robotics and autonomous systems can enhance the safety of the world around us and what is needed to enable this to happen. It brings together not only views from those developing or wanting to use the technology; but also from those representing social, legal and regulatory perspectives.

Foresight review of energy storage

We are reliant on energy. To be able to use it where and when we need it we have to be able to store energy and release it when needed. Professor Nigel Brandon, Director of the Sustainable Gas Institute at Imperial College, led this review explaining what energy storage actually is, why it is needed, and the threats and opportunities associated with the technology.

Roadmap on additive manufacturing

There is growing interest in the application of additive manufacturing. In November 2016 we published a roadmap consultation document that outlined the key safety aspects that need to be addressed in order to assure the safe application of this technology. A final document on additive manufacturing that takes into consideration the feedback from the consultation is yet to be published, but we will issue an insight report on this in the coming year.



Case study: Data-centric engineering comes to life, see page 11

Highlights and new grants

First for ICON

The International Consortium on Nanotechnology (ICON) held its first conference in Athens in April 2017. The programme has now awarded 27 PhD grants with a truly global spread.

Paper for the world's most cited journal

Foundation grant holder, Professor Andre Geim, University of Manchester, has had a paper accepted into the journal Nature, the world's most cited scientific journal. The paper, 'Molecular transport through capillaries made with atomic scale precision', was published in September 2016.

Transport postgraduate wins Ulf Aberg Award

Milena Studic, whose PhD at the Lloyd's Register Foundation Transport Risk Management Centre, Imperial College, was funded by the Foundation, has been awarded the Ulf Aberg Award for best postgraduate project, Developing a framework for total apron safety management. This award is given by the Chartered Institute of Ergonomics and Human Factors, and is the first time a researcher in civil engineering has beaten the traditional human factors and ergonomics departments around the world.

Clean-tech award winner

Yolandi Schoeman, a Foundation-funded International Water Security Network MSc student and innovator, was placed as global runner up in the 2017 Global Clean-tech awards competition for her natural filter for domestic water treatment. The Baoberry technology, for which Yolandi was recognised, is related to the eco-engineered 'wetlands in a box' that she presented at the Foundation's conference in October 2016.

Insight into distributed ledger technologies

Many people are familiar with Bitcoin; the established digital currency which first became popular in 2009 as a system allowing safe financial transactions without the need for an intermediary. More and more applications of distributed ledger technologies have been developed. The report issued by the UK's Government Office for Science in 2015, Distributed ledger technology: beyond block chain, has steered attention towards the 'shared ledger' approach and its potential for further applications, both in government and the wider economy.

In January, the Foundation, in partnership with The Alan Turing Institute, organised a workshop on the engineering applications of blockchain technologies. This workshop was led by Gary Pogson of the Lloyd's Register group. Distributed ledger technologies may be used in engineering systems for a range of applications. The workshop examined the pros and cons of such applications to society, bringing together people across disciplines, industry sectors, government and academia to look at innovative applications and the implications of this new technology for engineering. Since the year end this has now been the subject of an insight report published in September 2017.

Design for safety

Building on the success of a design challenge grant, awarded to the Royal College of Art (RCA) for safer ways to transfer between ships at sea, we awarded a grant of £80,000 to the RCA to lead the development of a foresight review in design for safety. The review will examine how safety can be improved through design and we will publish this review in 2017. For more about the RCA designs for safe ship boarding, see page 22.

Environmentally friendly electronics

The Foundation supported its second RAEng/LRF postdoctoral research fellow. Rebecca Boston from University of Sheffield is conducting research on creating nature-inspired non-toxic environmentally friendly electronics. Following independent peer review, Rebecca was also awarded funding from ICON to support a PhD.

Data for safety

The UK's Health and Safety Executive (HSE) holds 40 years' worth of accident investigations, legal cases and statistics. We have awarded a £10 million grant to the HSE to help digitise this information and add similar datasets from around the world to create a unique global safety data asset. Data analytics will unlock the knowledge within this data asset and apply it for the purpose of enhancing safety.

Future plans

In 2017/18 we plan to:

- Consult on and publish a foresight review on design for safety
- Publish our insight reports on distributed ledger technologies and additive manufacturing
- Initiate programmes based upon the recommendations of completed foresight and insight reviews where appropriate



Case study:

Data-centric engineering comes to life

The next decade will see step changes in data-driven technology, impacting all aspects of engineering and industry.

The Alan Turing Institute-Lloyd's Register Foundation programme into data-centric engineering addresses the issues set out in our Foresight review of big data: towards data-centric engineering. This includes research challenges, its application, the need for new skills and issues around data standards.

The Foundation's £10 million grant to the Institute was finalised in July 2015. The impetus of the work was significantly enhanced in January 2017 when Professor Mark Girolami FRSE was appointed to lead the programme.

An internationally leading researcher in statistical sciences, Mark holds a chair in statistics at Imperial College London and brings to the programme significant experience of developing and applying advanced statistical and computational techniques to engineering challenges. He leads the research programme, defines core challenges and works with industry to deploy data-centric engineering techniques to real-world problems. A new team has been established at The Alan Turing Institute and partnerships developed with industry and academia.



More information on the data-centric engineering programme can be found at www.turing.ac.uk/research_projects/programme-data-centric-engineering

Core challenges

The programme will tackle three core challenges.

Resilient and robust infrastructures

There is widespread, growing availability of heterogeneous data arising from major complex infrastructure systems such as cities, railways, industrial plant, ships, road networks and supply chains. These systems are characterised by multiple human and technological interfaces and provide an opportunity to make a step-change in our ability to provide robust protocols for a wide variety of engineering design issues. The grand challenge underlying this goal is to develop algorithms with the capability of optimally blending data with models in a manner which takes into account uncertainty in both.

Monitoring safety of complex engineering systems

Safety is a critical concern in the design and operation of countless engineered systems, from aircraft engines and aerospace structures, to vehicle electrical systems and even software. Understanding and anticipating the impact of rare and high-consequence events in these systems is essential. Research and development activities are also tied to questions of health monitoring and predictive maintenance, wherein by learning the state and the failure propensity of a system, users can carefully target repairs, modify operational envelopes, and make quantitative assessments of risk.

Data-driven engineering design under uncertainty

There are fundamental questions at the intersection of data and optimisation:

- optimal design under uncertainty, with particular attention to the management of risk
- optimal experimental design, yielding efficient and targeted strategies for sensing and identifying the most valuable elements of large and heterogeneous data sets
- optimal data collection for design optimisation, closing the loop between the design of engineered systems and the acquisition of data to inform these designs

Advances in these areas will impact engineering design across the entire spectrum of target applications described above, from aerospace to energy systems and critical infrastructure.

Making society safer through science

Progress on what we set out to achieve

Last year's review outlined our plans to publish results from our external evaluation; develop and adopt new practices for improving and measuring our impact; develop new programmes to accelerate the impact of our work; and open up the first of the opportunities within the resilience engineering programme.

The findings from our external evaluation by New Philanthropy Capital (NPC) highlighted significant improvements that could be made to our processes. As a result of this we have developed an impact framework that is now applied to all our major grants, grant proposals and internal charitable activities. The impact framework describes work under the titles of objectives; outputs; outcomes; outcome indicators; and impacts. This framework cuts across all our activity but is most related to the theme of this section as it accelerates the uptake of the Foundation's funded research.

We are now reviewing our grants management process to create an environment where proposals clearly articulate their impact framework and how these will be achieved, monitored and reported. For more about our new framework see page 25.

Several new programmes to accelerate the impact of research are given overleaf. In addition the first opportunities for wider engagement in the Arup-led resilience engineering programme were opened up.

Resilience engineering programme first calls

The Arup-led resilience engineering programme was officially launched at the Foundation's conference in October 2016. The first in a series of thematic calls for research proposals, aimed at supporting the programme's agenda setting, was opened in January 2017. The studies will map the pathways from where engineering practice for resilience is today (baselining) and the key gaps. The studies will be drawn together to create a roadmap from current practice to where we want to be in 2021. The call attracted over 70 proposals.

The programme was designed to endure beyond the Foundation's initial five-year grant. With this in mind it has developed a brand identity to support its longer term sustainability. The programme will go forward under the name of Resilience Shift. This name will become more established in the coming year and will facilitate additional funding partners in due course.



Our researchers work alongside practitioners from industry to solve safety problems.

Ruth Bumphrey
Director of Research





Harvesting seaweed.
Case study: Safety at sea – producing food and energy from our oceans, see page 15

Strategic theme 2: Accelerating the application of research

Highlights and new grants

Role of automation in railways

The Lloyd's Register Foundation Transport Risk Management Centre at Imperial College will be modelling and assessing the factors that affect human performance in railway operations and maintenance related to the role of automation.

Internet of things project

The Foundation gave a £250,000 grant to the PETRAS consortium, a £10 million UK-based multi-industry consortium looking at safety and security in the internet of things. Our grant is supporting projects looking at security threats on industrial control systems; block chain applications for resilience in the smart energy sector; using the internet of things to understand dynamic risks in systems; and how manufacturers can strengthen their products against botnet attacks.

Safety of autonomous systems

Following the publication of our Foresight review in robotics and autonomous systems, we held an open call for expressions of interest to work with us on the priorities it identified. We received over 80 responses and held two workshops to help us define a future programme of work. The assurance of autonomous systems was chosen as the focus of the programme and a grant of £10 million to University of York will bring together those developing autonomous systems with those whose role it is to assure the safety of these, to develop a framework that tests and evolves routes to acceptance of these technologies.

Stability of fishing vessels

Statistics show that stability-related accidents account for 65% of fishing boat losses with associated loss of life. The Foundation is supporting Hook Marine to develop and test a real-time stability monitor that will operate in realistic sea conditions. Once in use in industry, this advance warning will reduce the hazards of flooding, capsizing and sinking.

First 3D printed steel bridge

The world's first 3D printed steel bridge is being built by MX3D in the Netherlands and will be installed for use across a canal in Amsterdam in 2018. The Foundation has awarded £246,500 to a consortium led by MX3D to enable the bridge to sense and interpret its own condition to ensure safety and make data publicly available for others to assist innovation.

Monitoring LNG tanks

A consortium led by the University of Southampton, with Imperial College and Transense, has been awarded £600,000 to apply Transense sensor technology for the monitoring of liquid natural gas (LNG) tanks. The sensors will allow permanent monitoring of these tanks, particular on ocean-going vessels, removing the hazards and challenges associated with manual inspections.

Future plans

in 2017/18 we plan to:

- Resilience Shift will hold international agenda setting workshops in 2017 and will publish its first outputs
- The Foundation will work together with its trading arm, the Lloyd's Register group, to maximise the value to society of the Foundation's funding by supporting routes to accelerated application of research
- The Foundation will establish a programme for close-to-market grant giving and award its first grants
- The first demonstrators will begin in the University of York-led assuring autonomy programme
- We will continuously improve our impact framework and learn from others in the sector



Case study: Safety at sea – producing food and energy from our oceans

SOMOS: Technical standards for safe production of food and feed from marine plants and safe use of ocean space

As we are using our oceans and seas more intensively, can different types of operation be sustainably integrated in order to safely use our sea space?

A partnership between the Foundation, Wageningen University & Research and TNO is investigating safety aspects of combined activities at sea. It focuses on seaweed, used not only for food, but also animal feed, bio-chemicals, energy and other valuable products, in combination with offshore renewable energy production.

The goal is to develop a meaningful safety assessment and safety control with five objectives:

- Demonstrate that multiple economic activities can take place at sea in a safe fashion
- Establish a method for assessing the safety of multiple economic activities at sea
- Identify tools which must be used to carry out the analyses and assessments required to ensure an acceptable safety level
- Provide a proof of principle, based on demonstrators, of safe use of sea for combined seaweed and energy production
- Create capacity in the marine and maritime community of policy makers, certifiers and operators and initiate a public debate on this issue of safety of multiple uses of marine space with all the stakeholders: politicians, financiers, businesses, operators, legal representatives and societal groups

Framework for a safety assessment

The project was set up to be multi-disciplinary, as economic, environmental, marine, social and food aspects of safety need to be addressed to develop a comprehensive framework for a safety assessment of this combination of activities at sea. The framework will help integrate different uses in a safe way by developing standards

and safe operational practices. In this way, the project will address the global challenges of producing food, energy and efficient use of our waters to cater for the needs of the world population of 2050.

The safety aspect in the project concerns six areas, including feed and food safety hazards of marine production, safety of people and property at sea, marine interactions, such as competition between alternative uses, and cumulative effects such as pollution. This will enhance the development of safety standards and regulations on food within the maritime field.

Find multi-use solutions

The project will deepen its understanding by means of a practical case study in which multi-use and safety aspects will be examined. The North Sea is one of the most crowded seas in the world, and as such, faces the challenge to find multi-use solutions. Different parties, such as government and industry, consider offshore production of seaweed a promising commercial activity where many offshore wind farms are built: a clear opportunity for multi-use.

Vincent Doumeizel, Vice President Food, Beverage & Sustainability of the Lloyd's Register group, will help steer the project as a member of its advisory board. He comments: "This is the first project targeted at the food sector to be funded by the Foundation, and I am honoured to be joining the advisory board. The current reliance on meat and soya has a significant impact on the environment and will become unsustainable as diets become richer. Marine plants could be a sustainable source of protein, fresh water and energy for the growing global population. It is exciting to be involved in research into viable alternatives."

The aim is to translate vision into practical solutions. The project will deliver a practical framework with standards and skills as well as a set of recommended practices. The framework will be developed in co-operation with relevant authorities, certifiers and operators to enhance education and skills development within this community, including engineers and scientists.

<https://www.wur.nl/en/project/SOMOS.htm>

Understanding + evidence + partnerships = informed decisions

Progress on what we set out to achieve

Our plans for 2016/17 included starting work on our global safety outlook project, aimed at ensuring that society has a trusted global evidence base for the safety of life and property; initiating a programme of identifying and addressing grand challenges to safety; establishing the future of our Heritage and Education Centre (HEC), involving putting to work the Lloyd's Register's group 257 years of maritime archives in pursuit of the public education element of our charitable purpose, and; working together with the Lloyd's Register group towards making the world a safer place.

Overall, we have made good progress in all these areas, as well as delivering on other exciting opportunities that arose in the year. We now consider that the work of the HEC is a better fit under our fourth strategic theme, promoting advancement of skills and education, as you can read on page 22. We did not make as much progress on the global safety outlook project as we had hoped at the outset; largely due to reprioritising resources onto attractive responsive mode applications that were submitted to us in the year. During 2016/17 our ratio of responsive to directive mode commitments was 50:50, a significant increase in the pattern compared to previous years. Although the global safety outlook project got off to a slower start than hoped, on a positive note it shows the flexibility and agility of the Foundation and its ability to engage in innovative and impactful new opportunities that present themselves. Next year we will redouble our efforts to get the global safety outlook project on track.



**We'll help society to
make better decisions
about safety.**

Richard Clegg
Foundation Chief Executive



**People possess mixed preconceptions, attitudes,
worries and anxieties towards risk.**
Case study: **Public understanding of risk**, see page 19.





Highlights and new grants

Foundation international conference

The first Foundation international conference, 'Bringing safety to life', was a great success. Held in London on 13-14 October 2016, it brought together more than 300 people from 14 countries across our grants community, industry, media and the public. There were 33 presentations, ranging from Foundation-funded apprentices to a Nobel Prize winner, as well as four high profile keynote speakers; Professor Sir Andre Geim; Professor Sir David Spiegelhalter; Professor Sir Mark Walport; and Lord Willetts. We are looking forward to building on its success and planning our next conference, scheduled for May 2018.

Videos of all the presentations are available to view online at <http://lrfoundation.org.uk/news/2016/2016-conference-videos.aspx>

Global safety challenges

The Foundation asked NESTA (the UK-based National Endowment for Science, Technology and the Arts) to work with us in identifying global safety challenges. This campaign was launched at the Foundation's conference in October 2016. Working with Nesta's Challenge Prize Centre a consultation exercise was carried out with wider society and our grants community to gain a perspective on the key global challenges that affect safety. The focus of the consultation was on those areas where safety may risk being compromised when people come into contact with critical infrastructure, or where the safety of critical infrastructure is itself threatened. We openly and freely published the output from the NESTA consultation work as an insight report; the first document of this type in our report series. <http://www.lrfoundation.org.uk/publications/insight-global-safety-challenges-download.aspx>

Foresight review on global safety knowledge, analytics and data

We are pleased that Professor Andrew Curran, chief scientist for the UK's HSE, working in partnership with Polecat Intelligence Ltd, has agreed to lead the scoping work for this foresight review. Its findings will be used as input to the due diligence for the global safety outlook project, which is aimed at producing a trusted and independent, authoritative source of world data and its interpretation when linked to the safety of life and property. We aim to publish the foresight review in 2017/18.

Promoting nuclear power on safety grounds

Professor Michael Fitzpatrick from Coventry University wrote an article for The Conversation titled, 'Nuclear power is set to get a lot safer (and cheaper) – here's why'. Published in April, this article was also picked up by The Independent newspaper. Coventry University is part of a Foundation-funded consortium, the International Joint Research Centre for the Safety of Nuclear Energy, led by Lancaster University. The Conversation, a news and analysis website, where every article is a collaboration between an academic expert and a journalist, receives a grant from the Foundation.

Michael is a member of our Advisory Board and one of our 100A1 Ambassadors (see page 25).



Speakers ranged from apprentices to a Nobel Prize winner all of them highlighting how the Foundation is turning strategy into action and making an impact in pursuit of our charitable purpose.

Future plans

In 2017/18 we plan to:

- Work with the National University of Singapore (NUS) to appoint the first Director for the Lloyd's Register Foundation Institute for the Public Understanding of Risk, and move from planning to operational delivery of the new Institute
- Publish our foresight review linked to the global safety outlook project
- Launch the next steps on our global safety challenges programme



When there is a poor public understanding of risk we make poor decisions, collectively and individually. We expend society's resources alleviating anxieties rather than saving risk.



Case study:

Public understanding of risk

The mission of the Foundation, which is to enhance the safety of life and property and to advance public education, begs the question of in whose eyes is the world a safer place as a result of the Foundation's work?

The answer is in the eyes of society; the general public. But the public is heterogeneous. People possess mixed preconceptions, attitudes and anxieties towards risk, some of them defying science. This matters because when there is poor public understanding of risk we make poor decisions, collectively and individually. We expend society's resources alleviating anxieties rather than saving risk.

In line with the Foundation's strategy, we launched a major grant of £10 million over five years in 2016, to establish the Lloyd's Register Foundation Institute for the Public Understanding of Risk (LRFI) with the National University of Singapore (NUS). Although based in Singapore, the new Institute will cover wider Asia, and build links internationally. NUS matched the Foundation's grant with £11 million of its own funding; 65% of the total funding is being placed in a permanent endowment fund to ensure the sustainability of the Institute and its key posts. The remainder of the funding is being allocated to research projects and public outreach activities.

The aim of the Institute is to promote good science, good debate and good evidence. The reason for collaborating with NUS is that the area of the public understanding of risk and communication of science is not as developed in Asia compared to the UK and USA.

The culture, attitude and role of science are also different in Asian society. As a result, the Institute is unique, and the first of its kind in Asia. It will undertake research and education and build connections with practical end-users, including policy makers, decision makers, and opinion formers in government; industry, regulators, the media, and the general public. It is going to be multi-disciplinary spanning engineering, statistics, sociology and psychology.

The LRFI will help build a better understanding of the socio-technological processes and factors affecting public opinion forming, and will produce new tools and approaches for uptake by the end-users.

The new institute was officially launched on 3 October 2016 at a ceremony at NUS with around 200 guests. This was followed by an expert panel meeting on 7-8 March 2017 in Princeton USA, leading to publication of the Foundation's seventh foresight review, the Foresight review on the public understanding of risk. NUS have also assembled an international search panel to find the first director for the Institute; this appointment should be announced later in 2017.



New priorities; impact through inspiration

Progress on what we set out to achieve

Our last annual review highlighted the intended appointment of our first Director of Skills and Education, and the aim to review the direction of travel of our skills and education activities. With that in mind, we outlined some indicative plans for the year, identifying those areas in which we anticipated making a distinctive contribution. These included funding of skills and STEM education to disadvantaged and under-represented communities; funding of technological skills training; practical innovation skills training (supporting our strategic theme to accelerate the uptake of research); establishing an alumni group of Foundation-funded beneficiaries; determining the future of our heritage collection; and working with world-renowned institutions, enhancing our own reputation as a known foundation.


A focus on achieving the successful appointment of the director, Dr Tim Slingsby, who joined the Foundation in September 2016, and subsequent review of our priorities in this area, has meant that there have been fewer new skills and education activities than originally envisaged. Nevertheless, our funding is leading to valuable outcomes and we are confident that we are now on track for distinctive, international impact.

Highlights from our charitable activities and new grants

Number of space students rocket

Our funding of the UK's National Space Academy (NSA) activity has coincided with a surge of interest in space science within schools. Last year the European Space Agency astronaut, Tim Peake, used NSA specifically-designed kit to record classroom physics and chemistry demonstrations as part of a project requested by the UK Space Agency. The lead person for developing, building, and flight qualifying the kit is funded by the Foundation. The resulting teacher guides and videos are freely available to teachers and the public via a website hosted by the NSA, www.astroacademy.org.uk.

As a result of our funding, more than 3,500 UK students have taken part in NSA programmes, against a target of 1,500. This is a significant step in enhancing the size and quality of the science and engineering skills pool. Our funding is also allowing international collaboration between the National Space Centre and the Sharjah Centre for Astronomy and Space Science in the United Arab Emirates, and towards the creation of teaching resources and exchange of effective teaching practice, such as that between the NSA, Cite de l'Espace in France and the Polish Academy of Sciences.

 We'll support the development of the engineering-related skills that are needed now and in the future.

Tim Slingsby
Director of Skills and Education



Fuelling the future. Case study: Royal Institution Christmas Lectures, see page 23

Strategic theme 4: Promoting advancement of skills and education

Highlights and new grants

Designs for safe ship boarding

In 2016 we awarded a grant to the Royal College of Art (RCA) for its Innovation Design Engineering students to work on a pilot global safety challenge; safe ship boarding using pilot ladders. Eight designed innovations, focused on reducing risk and saving lives on water, were displayed for the first time during a symposium and exhibition held at our offices. Wider consultation confirms that some of the ideas have potential for onward development and exploitation which we will follow up in 2017.

Saved – 270 lives at sea

Since 2007, nearly 3,000 new RNLI crew members have received essential sea survival and firefighting training as a result of our funding. The training resulted in positive changes in trainee skills, experience and confidence; between December 2015 and November 2016 crews from the stations that the Foundation supported rescued 5,626 people and saved 270 lives.

Alumni programme strengthens our engagement

Through our funding of scholarships, bursaries, apprenticeships and research, the Foundation has a multinational, multidisciplinary network of at least 1,000 early-career engineers. Our new alumni programme will strengthen our engagement with this network through training, events and networking and provide a resource for extending our influence and capturing longer-term outcomes of our funding. An example of the reach and understanding of impact we will gain through this programme is evident through our new grant to the International Maritime Law Institute, Malta (IMLI). This will continue to provide scholarships to government-nominated post-graduate students from developing economies. Once they have completed their studies these students return to positions of influence and enhance their country's capacity to participate in a meaningful manner in the harmonisation and unification of international maritime law - providing the security and stability to enhance the safety of life at sea.

Putting our archive to work

We are the custodians of the Lloyd's Register library and archive, covering 257 years of maritime history and technological innovation.

We have previously committed to rehouse, catalogue, conserve and digitise 10% of our 1.25 million historic ship plans and reports through Project Undaunted. Nearly 25,000 documents have already been catalogued and we aim to release the first batch of digitised documents before December 2017.

Through activities including the crowd-sourcing project HEC Needs You (which increased our knowledge of the 15 members of staff listed on the WW1 memorial at our London offices) we have seen a 102% increase in website hits. We will make more of our resources available through our website in 2017/18.

Our Lives in Data

We are the principal funders of the Our Lives in Data exhibition at the UK's Science Museum. The exhibition launched in July 2016 and is attracting approximately 100,000 visitors per month. This large international audience is now better equipped to understand some of the diverse ways data is being collected, analysed and used.

Born to Engineer

In the last review we highlighted the Born to Engineer campaign. The ERA Foundation's campaign aims to improve the diversity of engineers and inspire more young people into engineering careers. The video we funded features Lewis Wilde, a marine apprentice at Island RIBs benefitting from our grant to The Shipwrights Company Charitable Fund. The experience has been invaluable to Lewis; his enthusiasm for boatbuilding and commitment to career choice has been reinforced and he was invited to speak at the Lloyd's Register Foundation international conference. The video has had 40,000 views, and it will have had more views through partners such as UCAS and National STEM Learning Centre.

Updated priorities for skills and education

In March 2017, the Foundation Board of Trustees approved a paper that identified our new priorities for skills and education. These were built on our existing strategy, consultation with our network and the UK STEM Education Landscape report, funded by the Foundation and published by the Royal Academy of Engineering.

New priority	Description
Skills for safety	Developing safety skills and capacity in countries undergoing rapid development in infrastructure or new technologies for the first time, or ramping up from a small base, in order to help them select, licence and operate safely.
STEM education for unsupported communities	Focusing on disadvantaged or under-represented communities outside the UK with the greatest need and where there is limited funding from others. This might include refugees, those in poverty, or first nation people.
Skills for innovation and entrepreneurship	Developing skills in young engineers, on top of their technical training making them innovation ready. Driver is investing in people as well as ideas linked to our strategy of accelerating the application of research.
Skills for emerging technologies	Building on our foresight reviews, identifying skills required by current and future engineers, such as in data-centric engineering and resilience engineering.
Heritage and Education Centre (HEC)	Putting our archive to work and widening access to it as a unique educational and historical resource.
Alumni	Remaining connected with those inspired by our programmes. Tracking our beneficiaries allowing us to capture long-term outcomes and impact of our funding.



The quality of instruction was outstanding. I'm really proud of what we achieved and I'm certainly better prepared.

Robert Dawes, Fishguard RNLI

Future plans

In 2017/28 we plan to:

- Develop programmes using our updated skills and education priorities
- Have an increased international focus
- Connect skills and education activities with all parts of our mission
- Launch our alumni programme
- Begin the release of our digitised historical archive



Case study:

Royal Institution Christmas Lectures

Supercharged: fuelling the future, explored one of humankind's biggest challenges: how to generate and store energy.

We can meet our priorities for skills and education by supporting organisations that share our aims. This provides opportunities to extend our influence and reach, building a reputation for distinctive, high impact support of engineering education.

In 2016, we supported the Royal Institution's prestigious Christmas Lectures. They were presented by Professor Saiful Islam, University of Bath, who explored the subject of energy. Along the way, Saiful even broke the world-record for the most powerful battery made of lemons.

So far the 2016 lectures have achieved over 3.5 million interactions through broadcast, theatre attendees, and social media, including over 1.7 million viewers on BBC4. The lectures also generated 146 pieces of national and international coverage across print media, online and broadcast.

A Science in Schools Show, based on the 2016 Christmas lectures, has been available for UK schools since April 2017. The show will aim to reach 50 schools and over 7,000 students, inspiring the next generation of scientists.

Internationally, the lectures can be viewed online and the live presentations will travel to both Japan and Singapore in 2017, emphasising the Foundation's aim to advance public education and also further increasing Saiful's profile and his vastly increased potential to inspire the next generation of engineers and scientists.



Saiful is one of our 100A1 Ambassadors (see page 25).

The Christmas Lectures videos can be viewed at <http://richannel.org/christmas-lectures/2016/supercharged-fuelling-the-future>

Governance and management

Driving impact and excellence.



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

1 Thomas Thune Andersen Thomas Thune Andersen is the Chairman of the Lloyd's Register Foundation and Chairman of Lloyd's Register Group Limited. He is a member of the Foundation's Nominations Committee and the Lloyd's Register Group Limited Remuneration Committee.

Thomas, a former member of the executive board of the A.P. Moller-Maersk Group with more than 30 years tenure in its maritime and energy sectors, was appointed to the board of the former Lloyd's Register in June 2010. Thomas is Chairman of Dong Energy A/S, Vice Chairman of VKR Holding, the parent group of Velux, and Non-Executive Director of Petrofac and BW Offshore Limited.

2 Sir Brian Bender Brian retired from the Civil Service in 2009, having been a Permanent Secretary for nearly 10 years. His final position was at the Department for Business, having served previously at DEFRA. He is Chairman of the London

Metal Exchange, and a governor of Dulwich College and a non-executive director of Pool Reinsurance, among other posts. Brian chairs the Nominations Committee.

3 Ron Henderson Ron is a chartered accountant and former CFO of Network Rail and Balfour Beatty. In addition to other non-executive roles, he also served on the UK Auditing Practices Board. Ron chairs the Foundation's Audit, Risk and Investment Committee, is a non-executive director of Lloyd's Register Group Limited and chairs its Audit and Risk Committee.

4 Rosemary Martin Rosemary is Group General Counsel and Company Secretary of Vodafone Group and was previously CEO of the Practical Law Group. She is a member of the Financial Services Authority's Listing Group Advisory Committee and an independent non-executive of Ernst & Young. Rosemary represents the Foundation on the Lloyd's Register Group Limited Remuneration Committee.

5 Carol Sergeant CBE Carol has non-executive positions on the boards of Danske Bank AS and TP ICAP plc. She is also Chairman of the BSI Standards Strategy and Policy Committee, and a member of the Governing Council and Trustee of the Centre for the Study of Financial Innovation. She

has previously been Managing Director on the board of the FSA, Chairman of Public Concern at Work, and Chief Risk Officer at Lloyds Banking Group, having begun her career at the Bank of England.

6 Lambros Varnavides Lambros is the former Managing Director and Global Head of Shipping at The Royal Bank of Scotland. He chairs the Baltic Exchange and its Charity Committee. He is a court assistant to the Worshipful Company of Shipwrights and chairs its Finance Committee. He is also a Younger Brother of Trinity House Corporation. Lambros was appointed Senior Independent Trustee of the Lloyd's Register Foundation in September 2015 and chairs the Grants Committee.

Governance structure

The Board is currently made up of six Trustees who are also the members and directors of the Foundation for Companies Act 2006 purposes. The Board considers Foundation policies, receives committee reports and recommendations, approves annual budgets, reviews the performance of the trading arm, and guides the Foundation Chief Executive.

The Board is supported by three committees, which have delegated authority on certain matters (Grants; Audit, Risk and Investment;

and Nominations). Trustees and other non-executives sit on these committees.

The Foundation Chief Executive, Richard Clegg, is responsible to the Board for the operation of the Foundation. For the future, there are likely to be factors inside and outside the Foundation's control that are relevant to achieving our objectives. In the case of the management of risks, these are monitored by the Board of Trustees and the Audit, Risk and Investment Committee. Risks are identified and assessed and controls are reviewed throughout the year. We have worked hard to build up an appropriate governance structure that is consistent with our charitable vision. Under this structure, there is a clear separation between the Foundation's charitable activities and the profit-making activities of the Lloyd's Register group.

Organisational structure

The Foundation has a total of 16 dedicated staff. A service level agreement exists between the Foundation and its trading arm, Lloyd's Register Group Limited, for the provision of specialist business support in areas including finance, HR, communications, legal and IT. The Foundation pays for these services at an agreed market rate.

Grant making policy

The Foundation has a formal governance structure for grant decision making. The Foundation can receive grant proposals and at any time. All proposals applications are reviewed initially at our monthly grant applications meetings.

Applications up to and including £250k are approved by the Foundation Chief Executive. Applications from £250k - £500k can be approved by the chair of the Grants Committee and that can happen either side of the grant application meetings. Applications over £500k must first go to the Grants Committee then to our Board of Trustees, which meets quarterly. Final decisions on these applications are made by the Trustees.

Details of available funding and the online application process are published on our website and notified on social media. Grant holders are required to submit staged reports as part of the process to track delivery against the agreed grant objectives, as well as to monitor the impact and public benefit being generated.

The Advisory Council

The Advisory Council continues to assist the Foundation on delivering its charitable aims by providing independent expert advice, support and constructive challenge in areas including developing general strategy and plans, identifying new funding opportunities and emerging priorities, maximising impact, plus suggesting other bodies to work with. The Advisory Council meets twice a year.

For details of the members of the Advisory Board see www.lrfoundation.org.uk/about-us/advisory-council

100A1 Ambassadors

The Lloyd's Register Foundation launched the 100A1 Ambassadors programme in early 2017. As a global charity committed to enhancing the safety of life and property and advancing public education, its aim through the ambassador programme is to build an international network of friends, stakeholders and beneficiaries who are willing to promote the mission of the Foundation and its causes. For details of our 100A1 Ambassadors see www.lrfoundation.org.uk/about-us/100a1-ambassadors

360Giving

We are committed to being as transparent as possible so the Foundation is pleased to be one of the growing number of significant UK grant-givers to share grants data through the 360Giving standard. 360Giving supports organisations to publish their grants data in an open, standardised way and helps people to understand and use the data to support decision-making and learning across the charitable giving sector. For more information see www.lrfoundation.org.uk/programmes/360giving-data

Total footprint of our impact

We have always said that impact and excellence are the two key criteria driving our grant giving. Impact is about translating the outcome of that work into benefit to society in line with our charitable purpose, and excellence is about doing relevant work of high quality.

We realise that we can create impact not just from our grants but in other ways too. In particular, we recognise as a Foundation that we make other investments that can have the potential to deliver a social return. These include financial investments such as applied to management of our endowment

fund, programme related investments applied to some of our grants where we aim to accelerate the exploitation of arising intellectual property, and social return investments such as our mixed motive shareholding of Lloyd's Register Group Limited. In 2017/18 we will be developing our understanding and practices in this area as part of our aim to optimise the total footprint of our impact.

During 2016/17 we developed and applied an impact framework and also commissioned an independent evaluation of our grants impact to date. All of this is being fed back into processes, strengthening our systems and helping us become a more efficient and effective foundation, benchmarked against others in the sector.

The framework the Foundation will use will be based on defining outputs, outcomes and impact. In terms of timescales, outputs are likely to be short term (arising during the lifetime of a project or grant), whereas outcomes are more medium term, and impacts are even longer term and might not be apparent until many years after the grant has expired. We have updated our online grant application forms, reporting forms and guidance documents in line with our new framework.



We realise that we can create impact not just from our grants but in other ways too.



Lloyd's Register
Foundation

Get in touch

Please visit www.lrfoundation.org.uk
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