

# Reaching new heights for a safer world.



Lloyd's  
Register



# Safety is core to everything we do, for our colleagues, for our customers and for society.

In a world of increasing complexity – overloaded with data and opinion – we know that our clients need more than technology to succeed.

They need an experienced hand. A partner to listen, cut through the noise and focus on what really matters to them and their customers. Our engineers and technical experts are dedicated to assurance. That means a commitment to embracing new technology and a deep-rooted desire to drive increased safety standards, more dynamic risk management and better performance. For almost 260 years we have worked in partnership with our public and private sector clients, understanding their needs and using our expertise to deliver solutions that add value and protect reputations.

Group turnover

**£893m**

2017/18: £864m

Average headcount

**7,117**

2017/18: 6,809

Given to Lloyd's Register Foundation in the past four years

**£64.2m**

Reduction in high potential incidents (HIPOs) since 2016

**56%**

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I'd like to thank my colleagues for providing the high levels of advice and support our customers expect. I'm proud to lead such a great company, working with so many talented colleagues around the world.

**Alastair Marsh**  
Chief Executive Officer,  
Lloyd's Register Group Limited

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# Working together for a safer world.

## Who we are

Lloyd's Register (LR) is a global professional services organisation specialising in engineering and technology solutions that improve the safety and performance of complex, critical infrastructure and supply chains.

Our technical expertise is supported by over 259 years of heritage from our beginnings as a marine classification society. We now operate across multiple industry sectors in over 75 countries employing over 7,100 permanent employees.

The profits we generate fund our shareholder, the Lloyd's Register Foundation (the Foundation), a charity which has at its heart a mission to enhance the safety of life and property. All of this helps us stand by the purpose that drives us every single day: Working together for a safer world.

**Organisation**  
LR has three business streams each providing a portfolio of professional services, ranging from compliance and assurance to optimising performance. In addition we offer digital products, cybersecurity and training. Our training is designed to meet the knowledge and skills development of our customer's workforce; part of our commitment to improving the safety and performance of companies worldwide. On environment and sustainability, our services help organisations meet regulatory requirements and go further by implementing voluntary improvements that can have significant business and environmental benefits.

**Sectors**  
We support over 77,000 customers who operate with complex and critical infrastructure across the global supply chain, predominantly in the maritime, oil and gas, nuclear, renewables, food and beverages, manufacturing, financial services and medical sectors.

**Customers**  
We have loyal and long-standing relationships with our customers and continue to develop our partnerships.



## Marine & Offshore

We are a leading international provider of classification, compliance and consultancy services to the marine and offshore industries, helping our customers design, construct and operate their assets to the highest levels of safety and performance.

## Turnover

**£427.7m**

Up from £408.4m last year

## Energy

We are a leading independent provider of digitally enabled engineering and technical professional services across the energy value chain. We have expertise across the sector, including oil and gas, nuclear power, offshore wind, onshore wind, solar, wave and tidal and energy storage.

## Turnover

**£143.5m**

Up from £140.3m last year



## Our values

- We care about each other, our customers and the environment.
- We share our expertise with each other, with our customers and with all of our stakeholders.
- We do the right thing in every situation.

See pages 16 to 17 for Strategy



## Business Assurance & Inspection Services (BA&IS)

LR's Business Assurance (BA) division specialises in management systems compliance and expert advice across a broad spectrum of standards, schemes and improvement services to include training and customised assurance. Our Inspection Services (IS) division certifies safety critical industrial equipment according to recognised codes, standards and regulations. Nettitude, LR's award-winning cybersecurity services organisation, is also a part of the BA&IS business stream.

## Turnover

**£321.6m**

Up from £315.0m last year

## Our commitment to sustainability

Our future depends on the critical decisions we all make today. Our commitment is steadfast and our journey ongoing. Look out for the Sustainability Development Goal (SDG) icons throughout our Annual Review.



# 259 years of experience.

Colleagues worldwide



**7,100**  
in over  
**75**  
countries

Working across

**886**  
sectors in over

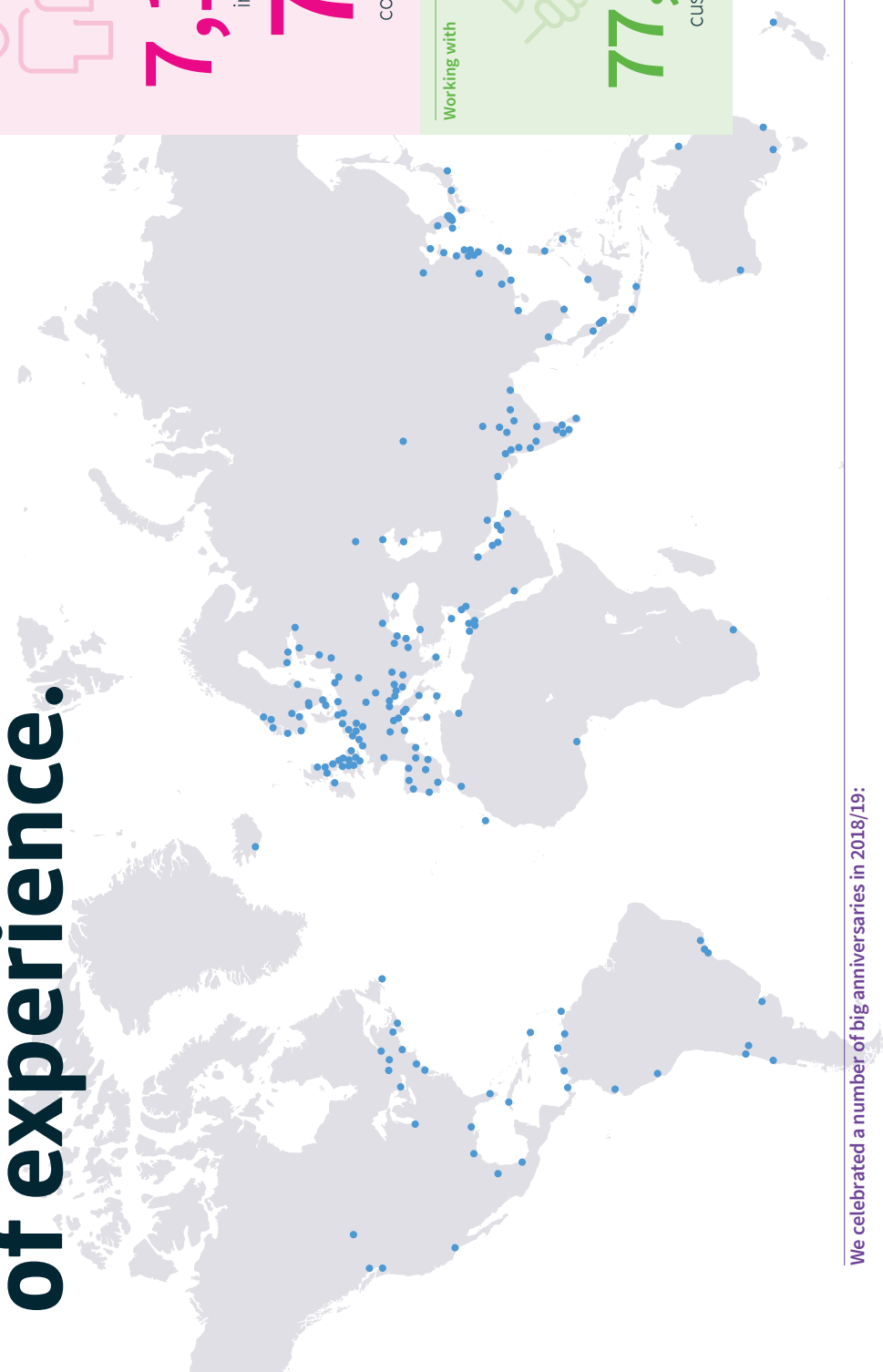


**173**  
countries

Working with



**77,000**  
customers



We celebrated a number of big anniversaries in 2018/19:

| 2018   | 2019   |
|--|--|
| <b>110 years</b><br>Trinidad and Tobago<br>(est. 1908) | <b>60 years</b><br>Bahrain<br>(est. 1959)      |
| <b>100 years</b><br>South Korea<br>(est. 1918)         | <b>150 years</b><br>Belgium<br>(est. 1869)     |
| <b>140 years</b><br>Singapore<br>(est. 1878)           | <b>150 years</b><br>Netherlands<br>(est. 1868) |

# Safety and profit with purpose.

**Throughout change and volatility, our purpose remains resolute – working together for a safer world.**



**Thomas Thune Andersen**  
Chairman

Despite a challenging market environment during the financial year, our business remained stable. Our global, marine and offshore new construction orderbook was higher than expected, although the longer term outlook is less optimistic, and we continue to see volatility in the energy sector.

We have transformed our operating model and have made investments in digital across all sectors, progressed to support our customers and created new opportunities for business growth. The focus on cost and operational efficiency will continue to improve our competitive advantage and the return to the Foundation.

## Safety and culture

Throughout change and volatility, our purpose remains resolute – working together for a safer world. LR's expertise across safety, security and sustainability, combined with the work of the Foundation, is focussed on making a positive impact on society within a purpose-driven business model for the 21st century.

Safety underpins all that we do and remains a priority for the Board, executive team and colleagues. We are pleased to record another year of improvement in our health and safety record including a further reduction in the rate of recordable and lost time incidents. Every incident is however a reminder of the challenges we face to achieve our aspiration of zero harm. This year, the introduction of data insights into our analysis brought new learnings to the team improving our safety training and I am delighted that we are sharing best practice with our customers around the world.

Strong collaboration between our consultancy and data innovation teams and the Foundation has helped us to become even more active in the Hilo Maritime Risk Management venture, an independent joint industry initiative founded by Shell, Maersk and LR. Hilo is using data, complex models and deep risk management consultancy expertise to improve safety in global shipping.

The Board is increasing its focus on diversity and inclusion and I am pleased to report progress towards the closing of the gender pay gap and the deployment of LR's new Diversity and Inclusion Programme across all leadership teams this year.

## Sustainability

In the two years since LR became a signatory to the United Nations Global Compact, the guardian of the UN Sustainable Development Goals and the world's largest corporate responsibility initiative, I am delighted to witness the progress being made. This includes the launch of the UNGC's Ocean Opportunities, Global Goals report on the role of business for a healthy, productive and well-governed ocean and our signatory to its Sustainable Ocean Principles covering climate change, ocean health and productivity, governance and engagement, and data and transparency. Our emphasis on ocean sustainability is reinforced in our work supporting customers to prepare to meet the obligations of the IMO's 2050 greenhouse gas (GHG) reduction target with further work on zero-emission vessels in partnership with the Global Maritime Forum.

## Board changes

I would like to thank my fellow Board members for their support, enthusiasm and commitment to strong governance throughout the year.

I would also like to extend my deep thanks to Ron Henderson who retired from the Board in December 2018 after 10 years of service to LR. His contribution has been tremendous including his Chairmanship of the Audit and Risk Committee and serving on the Pension Trustee Investment Board.

I take great pleasure in welcoming Ishbel Macpherson as a non-executive Director of the Lloyd's Register Group Limited Board and Chair of the Audit and Risk Committee. Ishbel has spent over 20 years in corporate finance in the City of London and since leaving the City has become an experienced non-executive Director.

Finally, on behalf of the Board, I would like to thank our Group Chief Executive Alastair Marsh, his executive team, and all our dedicated LR colleagues around the world, for navigating LR through such a challenging yet exciting year. We have great confidence in the ability of LR's exceptional people to continue the transformation of our unique organisation to meet the needs of tomorrow.

**Thomas Thune Andersen**  
Chairman, Lloyd's Register Group Limited



**LR's expertise, combined with the work of the Foundation, is focussed on making a positive impact on society within a purpose-driven business model for the 21st century.**



# Transforming our business.

**Four years ago, we launched a new strategy to transform our business. We looked to become more integrated, technology-enabled and agile, to increase our customer focus, to invest in our exceptional people and to increase our ability to influence the world around us.**



**Alastair Marsh**  
Chief Executive Officer



**Investing in our people is a key pillar of our strategy, not only to maintain our high standards of technical expertise and service delivery, but also to achieve our commercial goals in an evolving marketplace.**

Geopolitical and economic uncertainty impacted our core markets during this period, and throughout we managed to balance operational efficiency, cost effectiveness with investing for our future.

This year, despite the strong headwinds, we delivered modest growth, though our margin remained low reflecting the level of investment for the future and a difficult energy market. The scale of our change programme has been significant and we are now entering a period of consolidation and optimisation. To meet the needs of our customers we have prioritised investment in our products and services, specifically digitisation.

I am confident that the investment we have made to transform our business will set us up for success in the future, though I recognise that markets remain somewhat uncertain.

## Investing in our talent

Safety remains our number one priority and we employ best practice to improve our record and look after our colleagues, customers' employees and others. At year end we finalised our first three year Health and Safety improvement programme and achieved a 36% reduction in Lost Time Incident Rates (incidents per 200,000 hours worked). Over 35,000 hours of safety training was undertaken with a major global focus on *Working Over Water*.

Investing in our people is a key pillar of our strategy, not only to maintain our high standards of technical expertise and service delivery, but also to achieve our commercial goals in an evolving marketplace. We continue to develop the LR Academy, which provides colleagues across the world with 24/7 access to a curriculum of selected programmes across leadership and professional specialisms. Our core leadership and management programmes have been relaunched with new content reflecting our changing strategy and culture, making use of virtual channels for learning and peer coaching.

The deployment of our culture change programme, *Be the Change*, was completed this year, with over 6,000 colleagues participating through workshops delivered by a team of internal facilitators. This is generating an enduring and positive impact on language and behaviours across LR and planning is underway for the next phase of the programme.

The launch of our new global platform for measuring and understanding colleague engagement and views has equipped the leadership team to understand better the impact of change across LR.



Our Diversity and Inclusion (D&I) Programme is on track, with all leadership teams participating in workshops intended to help us understand unconscious bias and thereby increase our focus on D&I within the business.

## Customer first

We continually strive towards the vision of "making it easier for customers to work with us, everywhere, every time" and all colleagues are completing customer experience training through the LR Academy.

Maintaining our leadership in the global marine new construction order-book and increasing our overall fleet size is testament to our strong client relationships and their regard for our technical expertise and service delivery quality.

This year we delivered a pilot project using the customer journey mapping methodology in our B&B&S business which provided evidence of our customer experience at an individual level and through Net Promoter Scores.

We continue to partner with our customers to accelerate innovation and provide support for major issues, with examples being:

- The first autonomous navigation system on an ocean-going vessel, moving the industry towards the safe, efficient deployment of autonomous navigation systems.
- A ground-breaking co-operation project with Hyundai Heavy Industries to explore the value of blockchain when applied to ship building.
- The first ever approval of a digital twin health management system for marine applications, working with GE. This is the first step towards a truly digitalised classification service to help our customers use data to understand asset health over time.
- Providing significant support to ship owners preparing for compliance with the 0.5% global sulphur cap on fuel content to meet International Maritime Organisation (IMO) requirements from 1 January 2020.
- Two blockchain pilot projects focussed on asset and material traceability within the supply chain.
- Development of a brand new quality standard for additive manufacturing and first certification for an Oil & Gas major.

### Influencing our world

Our external affairs network continued to expand as we looked to share our specialist knowledge, increase our influence and build partnerships with governments, regulators and influential bodies to fulfil our purpose of "working together for a safer world". Relationships with the Department for International Trade deepened both in the UK and with British Embassy support in our core and developing markets.

In partnership with the UK's University Maritime Advisory Services (UMAS), a series of studies on low carbon transitions pathways were published for engine development, vessel design and operational implications relating to IMO ambitions. We also contributed to the work of the Global Maritime Forum (GMF) on zero-emissions vessels and the formulation of the Poseidon Principles, a pioneering set of principles that will integrate climate considerations into lending decisions in line with IMO's Greenhouse Gas (GHG) strategy.

LR is a signatory member of the United Nations Global Compact (UNGC) and we remain committed to embedding its 10 principles spanning human rights, labour, the environment and anti-corruption into our strategies and operations, as well as supporting the UN Sustainable Development Goals. Additionally, we are a founding member of the UNGCC's Action Platform for Sustainable Ocean Business and contributed to its recent 'Ocean Opportunities, Global Goals' report. We were early signatories to the Sustainable Ocean Principles, formally launched at the United National General Assembly in September 2019.

### Integrated operating model

Over the past three years we have made significant investments in our enterprise architecture, simplifying and standardising the back office, providing new tools and systems for our colleagues to improve their operational efficiency whilst also delivering an enhanced experience for our customers.

A new Enterprise Resource Planning (ERP) solution encompassing people and finance systems has been at its heart, aligning processes across all our businesses with automation and simplifying workflow from order to cash. We have now completed the global rollout, implementing in over 75 countries over two years, deploying across the four final areas – Americas, North Europe, North Asia and South Asia – this year.



### Challenging markets

Our core markets of marine and oil and gas were impacted by geopolitical and economic uncertainty, including trade sanctions and evolving global supply chains. In common with other regulatory bodies operating in the UK and European Union, we had to review our status to continue supporting customers with their certifications against an uncertain Brexit outcome.

In maritime, whilst the downturn was not as severe as some were forecasting, the short-term outlook remains very volatile, influenced significantly by geo-political sanctions and a growing proportion of vessels leaving the supply market for modifications in shipyards, as preparations for the 1st January 2020 Global Sulphur limit on fuel oil accelerate. The Clarkson's index for Global Contracting Forecasts has an expectation that there will be a rise driven primarily by tankers and gas ships. Cruise ship demand is forecast to keep growing, and while offshore vessel activity is expected to remain slow, some rig re-activation is expected, and the production niche is expected to see some upturn.

Turbulence continued in the energy market as demand moved ahead of supply. Demand is rising year-on-year in India, though there is only modest demand recovery in the Middle East and there is increased risk in European economies should there be a disorderly Brexit.

The markets for our certification business continued to see low single digit growth reflecting demand for the main international standards ISO9001 and ISO14001, with the final impact of the New Standards Transition being seen this year. The market for our customised assurance business, particularly in food, continued to grow as did the cyber market.



### Digital innovation

We are working in close collaboration with our customers, subject matter experts and an increasing number of technology partners to develop our innovation portfolio. This approach continued to gain momentum during the year with exciting new initiatives such as:

- Our asset performance and risk management product strategy with a £15m future sales pipeline for our flagship AllAssets™ product. The roadmap includes new differentiated propositions such as LR SafetyScanner™ and Maintenance Analytics.
- Establishing digital product capabilities relevant to the maritime and shipping sectors including Cloud Fleet Manager, where sales have grown significantly.
- Innovative data-driven service delivery achieved through bringing together our core business services and our digital product portfolio, as well as co-creation with customers.
- Building a network of over 400 start-ups and technology companies keen to solve critical safety and risk issues with the LR Safety Accelerator.
- Working closely with BP on the development of the SecondSight application pilot, bringing digital innovation to the verification and assurance services overseen by the critical blow out preventer systems on deep water drilling units.



### Group turnover

↑ **£892.8m**

Up £29.1m on previous year

### Financial results

Turnover of £892.8 million increased £29.1 million or 3.4% compared to financial year 2017/18 (2018: £863.7 million) at actual exchange rates. Turnover at prior year exchange rates was £895.0 million.

Operating profit before exceptional costs was £29.7 million, (2018: £15.8 million), £13.9 million higher than the previous year, due to the impact of increased revenue in Marine & Offshore, partially offset by the continuing challenges in the energy and inspection markets, plus the impact of the end of New Standards Transition on Business Assurance & Inspection Services margins.

Exceptional costs of £20.2 million included £11.0 million relating to system implementations, primarily the ERP programme and £6.2 million relating to business restructuring, including the Energy reshaping. Statutory operating profit, after exceptional costs, was £9.5 million (2018: £6.7 million).

Net assets for the Group at 30 June 2019 were £528.7 million (30 June 2018: £538.9 million), a decrease of £10.2 million, primarily reflecting movements in the valuation of our pension schemes. Net current assets have increased £10.8 million due to increased levels of accrued income.

The cash outflow of £15.2 million is a £39.1 million improvement on the prior year mainly due to the £39.3 million of cash outflows for acquisitions in the prior year.

## Business Streams' performance



**Our total share of the world fleet in service has increased to 16.3%, equating to 7,088 ships – our biggest increase in three years.**

### Marine & Offshore

The Marine & Offshore business generated turnover of £427.7 million (2018: £408.4 million), with the increase on the prior year reflecting strong performance in new construction.

The performance of the business should be seen in the context of a continued weak maritime new construction market and soft offshore market.

Our strong market performance means we have secured a leading position in new orders with 27.1% gross tonnage market share in Q4 – well ahead of the competition. This means we are still top of the global order book for new construction in terms of gross tonnage with a market share of 21.5%. In addition to leading the new construction gross tonnage, our total share of the world fleet in service has also increased to 16.3%, equating to 7,088 ships and 221.6 mGT under LR Class, which is our biggest increase in three years. Our consulting business and offshore operations performed well and continued to grow year on year.

### Marine & Offshore turnover

↑ **£427.7m**

Up £19.3m on previous year



### Energy

The Energy business generated turnover of £143.5 million (2018: £140.3 million). Although revenues were slightly up on the previous year, the market activity and pricing levels failed to recover from what has proved to be the longest global downturn in the oil and gas sector in many decades.

Following a challenging first quarter, it became apparent that pricing and market levels would not return as originally assumed. An extensive portfolio review was then launched to assess the global business performance and market potential across all the existing offering, also taking into account the structural change in client buying patterns and supply chain requirements across the energy value chain since the start of the downturn in 2014.

During the third quarter, a new leadership team was formed in the energy business and a new organisational structure was established, reducing our overhead cost base and retrenching from markets and geographies where services have become commoditised. The portfolio review also identified new

Longer term, the continuing demand for energy, initially hydrocarbons but increasingly renewables, also supports our growth plans.

### Energy turnover

↑ **£143.5m**

Up £3.2m on previous year





### Business Assurance & Inspection Services (BA&IS)

The BA&IS business generated turnover of £321.6 million (2018: £315.0m), a year-on-year revenue increase of 2.1%. Growth in customised assurance programmes across the food and industrial sectors, and certification to cybersecurity and health and safety standards, helped to offset a significant decline in ISO 9001 certification revenue as the transition to the new standard was completed in September 2018.

Our world continues to evolve and it is vital for our customers that we evolve with it to continue to meet their changing needs. Innovation is core to our offer of new, commercially-viable solutions that deliver real impact. More than 20,000 customers across the world are now using our client portal to manage their certification online, while our dedicated online food, beverage and hospitality portal provides companies in those sectors with tools to drive real-time assurance across their supply chains.

In Inspection Services, we are using drone technology and remote inspection capabilities, which have disrupted the market significantly, to provide customers with ways to reduce the time, travel and expense of traditional inspection services. We continue to develop partnerships to address the need for companies to comply with increasing regulation and consumer demands. One example of this is a joint industry project we spearheaded in collaboration with TWI Ltd to determine a pathway to certify Additive Manufactured industrial parts.

Training and improvement services remain an integral part of our business. In the last year we delivered thousands of face to face training courses worldwide to companies and individuals and we successfully launched our new e-learning platform in the UK. This will be rolled out globally and the portfolio of online courses expanded during 19/20.

Nettitude, our cybersecurity business which opened an office in Singapore in July to serve the Asian markets, made a significant contribution in its first full year of ownership. Revenues were up 26% year on year and we see opportunity to accelerate this growth through the provision of a full suite of threat-led cybersecurity services to other sectors where LR has an established market position.

We expect continued growth in customised assurance services as organisations seek to manage risk in complex global supply chains, particularly in the food and industrial sectors. Since the introduction of the international standard ISO 45001 in March 2018, we have seen many businesses move to this new standard as they look to demonstrate to their stakeholders that occupational health and safety sits at the heart of their organisation. We remain focussed on becoming the leading provider of certification services for health and safety standards.

### BA&IS turnover

**£321.6m**

Up £6.6m on previous year



More than 20,000 customers across the world are now using our client portal to manage their certification online.

### Future outlook

With our ability to combine deep technical expertise and industry knowledge, we exist to assure a better future for our customers, their customers and the world. Challenging the way in which we do things and embracing change, focussing on our markets and customers and celebrating innovation is fundamental to our ongoing success.

Some of the difficult decisions we've taken over the past couple of years have allowed us to strengthen our current business whilst increasing further our resilience. We believe the steps we have taken leave us well placed to maximise the benefits of the investments we have made.

Our aim is to become more widely recognised as an authority on compliance, assurance and performance, and to be more actively sought after for our opinion by governments, regulators and influential bodies, while seeking to continuously fulfil our purpose to make the world a safer place.

For and on behalf of the Board

**Alastair Marsh**

Chief Executive Officer, Lloyd's Register Group Limited



# Enhanced innovation and customer focus.

Our strategy is to help our customers operate their businesses and assets safely and profitably while optimising our return to the Foundation in order to fulfil our purpose to make the world a safer place.



## Our strategic priorities

- Strengthen our core business in traditional markets
- Grow in adjacent markets and sectors
- Extend our value proposition from compliance to assurance and performance optimisation
- Build digital innovation for asset performance and risk management
- Transform the LR operating model to optimise commercial effectiveness and operational efficiency
- Increase customer centricity
- Invest in our people and culture

## What makes us unique

- **Deep technical and industry knowledge**  
We're an expert in not only understanding the potential in cutting-edge ideas, but applying this pragmatically in ways which guarantee impact today and in the long-term.
- **Dedication to assurance**  
We explore every problem thoroughly with exact, analytical precision. We leave no stone unturned and no questions unanswered, to draw accurate conclusions.
- **Independence**  
We're committed to doing things the right way to reach the highest standards and best outcomes for all, giving our customers confidence in our decisions every time.
- **Understanding and empathy**  
We take time to understand the needs and unique circumstances of our customers and their businesses, to act with judgement, integrity, sensitivity and care.
- **Social business**  
We have evolved into the 21st century model for social business – not only funding the Foundation through our profits, but also discharging some of the Foundation's charitable objectives through our work in assuring the safety of critical infrastructure worldwide.

## Our stakeholders

- **Shareholder**  
Our shareholder, the Foundation, has at its heart a mission to enhance the safety of life and property through its strategic themes of: supporting excellent scientific research; accelerating the application of research; promoting safety and public understanding of risk; and promoting advancement of skills and education. Successfully and effectively meeting our customers' needs generates the capital to reinforce this mission.
- **Organisation**  
Our structure has three business streams each providing a portfolio of professional services progressing from compliance to providing assurance to optimising performance.
- **Sectors**  
We support over 77,000 customers who operate with complex and critical infrastructure across the global supply chain, predominantly in the maritime, energy, food and beverages, manufacturing, financial services and medical sectors.
- **Customers**  
We have loyal and long-standing relationships with the majority of our customers and continue to develop our partnerships.

## Insights

|   |   |
|---|---|
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# Using emerging technology to drive the evolution of safety.



**We urgently need new technology and thinking because the ways that people lose their lives today are the same ways people were dying on the job 30 to 40 years ago.**

**James Pomeroy**  
Group Health, Safety,  
Environment and Security  
(HSES) Director at LR



## Technologies of the fourth industrial age have the potential to transform safety, opening up new ways to save lives, prevent injuries and protect assets.

Every year, 2.8 million people around the world die because of workplace accidents or work-related diseases. Every day, over 6,000 people do not return home from work, and a further 860,000 are injured on the job. Apart from the emotional impact on loved ones, there is a significant economic burden. The International Labour Organisation (ILO) estimates that 4% of global GDP (\$2.8 trillion) is lost due to the costs of poor occupational health and safety (OHS).

### There is an urgent need for new approaches

In many developed economies, OHS performance has plateaued. James Pomeroy, Group HSES Director at LR, is not surprised: “How society thinks about risk and the methods used to keep people safe has not changed in decades, yet long held theories – such as the way to avoid serious accidents by focusing on minor incidents – are increasingly being challenged. While the number of minor injuries has fallen in almost all developed economies, the number of serious and fatal injuries has plateaued and is even increasing in some countries. We urgently need new technology and thinking because the ways that people lose their lives today are the same ways people were dying on the job 30 to 40 years ago.”

There is a burning need to rethink how we approach OHS and, importantly, to change attitudes towards safety risks. Dr Ruth Bounphrey, Director of Research and Strategic Programmes at the Foundation explains: “There should be a sense of outrage at the levels of fatalities and life-changing injuries. They are unacceptable and we should collectively aspire to achieve zero harm. This is the only way that we will drive the development of fresh approaches.”

### Applying technology and data analytics

The technologies and data of the fourth industrial age offer new ways to keep people safe, and James Pomeroy sees a role for these in two primary areas. Firstly, evidential thinking: “We need to understand what the data is telling us, conduct pilot studies and increase research to understand what we know and – importantly – don’t know. The second aspect centres on how we apply technology. There simply hasn’t been a technological transformation in safety like we have seen in other areas. Indeed some organisations still use primitive control measures to keep people safe, such as paper-based processes. We also see lots of untapped sources of data, such as incident reports and inspection records, almost all of which cannot be analysed

because they are not digital. In safety, we have lots of information, but lack real insight to improve performance. There is a need for more data-driven understanding and technology – such as fatigue monitoring or drone inspections – to be deployed to reduce risk.”

### Understanding human factors

Many accidents originate from human behaviour, therefore an improved understanding of human factors and psychology is key to keeping people safe. For example, it’s staggering to think that a quarter of deaths in confined spaces involve people attempting to rescue others. There is a need to understand the limitations of people’s physical abilities, how humans behave in different environments, as well as personal risks related to fatigue or stress. Local cultures, standards and economics also play a part. Senior Principal Human Factors Consultant, Jo Stokes, outlines the breadth of LR’s work: “We bring together expertise from ergonomics, psychology, physiology, sociology, anthropometrics and biomechanics to enhance health, safety, usability, performance and user experience. For example, we identify at an early stage in the workplace design who will be on the ship bridge, their roles, the systems and controls they need to reach and in what sequence, who they will need to talk to and how to minimise errors.” As safety systems become more complex and interconnected, the immediacy and consequences of human errors will be much greater. Assets, such as vessels and refineries are becoming larger and more complex, and these will affect how people respond in an emergency. The application of human factors will help us better understand and counter potential errors within design, while also planning for emergencies.

However, instilling a zero harm culture is not a quick process. There need to be policies, procedures and supporting systems in place, as well as organisational factors around values and beliefs. Jo adds: “Applying our proven culture model that sets out the elements that need to work well, we identify areas for improvement. For example, there is an optimal level of responsibility and workload to avoid complacency or – at the other extreme – errors stemming from stress or fatigue.”

**Joining the dots between research and practice**  
LR is uniquely able to leverage the research and insights of the Foundation, the only global charity dedicated to safety. Dr Ruth Boumphrey, points to the immense value in bringing together research with practice and evidence from real-world problems. "LR is the ultimate safety laboratory; evidential data is fed to the Foundation, and the Foundation's research informs LR's work. The results can be eye-opening." For example, the insight provided by the Foundation's Foresight review of robotics and autonomous systems contributed to LR's guidance for Unmanned Aircraft Systems certification.



**As safety systems become more complex and interconnected, the immediacy and consequences of human errors will be much greater.**

**Jo Stokes**  
Senior Principal Human Factors Consultant at LR



**LR is the ultimate safety laboratory; evidential data is fed to the Foundation, and the Foundation's research informs LR's work. The results can be eye opening.**

**Dr Ruth Boumphrey**  
Director of Research and Strategic Programmes at the Foundation

As a charity, the Foundation is able to focus on problems that are hidden or not talked about and take a long-term view on future challenges. Society has a history of learning from catastrophic events such as Deepwater Horizon and Challenger, yet large numbers of people die at work every day in less high profile ways.

The Foundation's purpose is to engineer a safer world and it works with Non-Governmental Organisations (NGOs) to speak out and find solutions – It could be something as simple as providing fishermen with phone apps so they can have appropriate weather forecasts.

James Pomeroy also highlights the demographic angle to safety: in some countries, half of the population is aged under 25, so there is a relatively small pool of experienced people from whom to transfer knowledge. Conversely, in many developed markets, work patterns are shifting as people work to a later age or as part of the gig economy, which raises questions about training, equipment and policies, as well as how to empower these people to speak up about their own safety.

As James summarises: "The pace of industrial growth is dizzying, particularly in South East Asia and Africa, and developments are happening in three to four years that previously would have taken 50 years. There is a real need to think differently. We need to be curious, courageous and harness expertise from different disciplines. Together, LR and the Foundation are uniquely able to bring to bear the deep expertise developed over their 260 year history, and to draw on specialist knowledge from academia and beyond."



CASE STUDY

**LR develops new AI solution to reduce injuries to customers and employees.**

**The challenge**

Separate tools and systems for managing Health, Safety and Environmental (HSE) issues have been developed over the years. These are now being integrated to provide organisations with the assurance that critical HSE risks are effectively recorded and managed.

Most organisations are currently at a transitional level, moving from a traditional, paper based HSE process to a digitalised HSE data capture system. However, many now require more enhanced systems to not only capture data in a digital format but to also draw meaningful insights from the data.



**We are continually looking to improve our safety environment in all locations across the UK. Based on initial trials with LR, we anticipate that LR SafetyScanner™ will help us create an even safer environment for our customers and employees.**

**Darren Read**  
Fire, Health & Safety  
Manager, Mitchells &  
Butlers

**The solution**

Developed by our digital innovation practice, LR Aurora, LR SafetyScanner™ uses unique Artificial Intelligence (AI) and Natural Language Processing (NLP) technologies to quickly and easily collect raw accident description data from multiple formats, transforming it into meaningful insights that highlight areas of high HSE risk.



**Two years in the making, we have harnessed cutting edge digital technology and data science to develop LR SafetyScanner™. Winning business has shown that it appeals to customers across very different sectors, including maritime, oil and gas and hospitality. I am truly thankful to the hidden champions from across all of our business streams that collaborated to make this a reality.**

**Ran Merkazy**  
VP, Product & Service  
Innovation at LR

**The result**

LR partnered with the Environment, Health and Safety team at Mitchells & Butlers (MAB), one of the largest operators of restaurants, pubs and bars in the UK, to deploy LR SafetyScanner™ to reduce injuries to customers and employees across MAB's 1,700 outlets throughout the UK.

These data insights can be cross-referenced with claims data to highlight trending incident patterns and areas of claims risk. This allows a clearer view of performance over time to more effectively identify areas of improvement. This information will help MAB reduce the risk of accidents or incidents in the future and create safer locations for both employees and customers.

**Leading edge**

Integrated digital HSE system with applied predictive analytics and AI.

Latest technology leverage to unlock insights and create value for the business. This is an ongoing journey.

**Transitional**

Digitised HSE data capture systems.

Data is digitised but not integrated to offer decisions making insights.

**Traditional**

Paper based HSE processes and systems.

Data exists but not in a format that is usable.





**CASE STUDY**

**Minimising safety risk through the use of drones.**

**The challenge**

It can be challenging for our surveyors to work in confined spaces and hazardous locations. Equally, our clients are keen to avoid the costly disruptions associated with surveys and inspections.

Adani Ports and Special Economic Zone Ltd (APSEZ) is India's largest private port operator and an end-to-end logistics provider. The organisation owns 10 strategically located ports and terminals, which represent 24% of India's port capacity. The availability of the port cranes is essential to the entire port operation. Periodically, these port cranes are subjected to inspection to identify areas that require maintenance, repair, or replacement. Conventional closed-up visual inspection poses operation risk and can also be time consuming.

**The solution**

Using drones for remote inspection is an effective solution that provides a win-win for both client and surveyor. To realise this opportunity, LR has introduced the use of Unmanned Aircraft System (UAS), more commonly known as drones, as part of our portfolio.

For APSEZ, a proof-of-concept project was set up to explore the feasibility of using drones to complement conventional closed-up visual inspection of the port cranes. The project was broken into two stages:

- Stage 1 – Unmanned Aircraft System (UAS) service provider suitability and capability assessment using LR's guidance notes.
- Stage 2 – Drone data capture and data interpretation by an experienced and qualified LR inspector.

LR's guidance notes were developed to provide a framework to allow for the assessment and selection of a qualified service provider. The guidance notes allow LR to systematically assess a service provider through desktop review, office audit, and capability assessment. Upon successful selection of the suitable vendor, LR worked with the vendor to select the most suitable UAS and camera by taking into consideration different aspects including operation risk and camera resolution.

After a rigorous selection and preparation process, the project team, consisting of LR port crane in-service inspection specialists, the selected UAS service provider, and a member of our innovation team, attended the site to perform the inspection.

**The result**

The project proved that:

- Existing enterprise grade UAS can be used to assist port crane in-service inspection as the image and video qualities are suitable for preliminary engineering judgement to be made.
- The use of UAS is useful for areas which are difficult to access such as the forestay, backstay, underneath of back reach, underneath of boom, and A-frame-to-stays connections.

# Building a better tomorrow, today.

We always stay true to our purpose and use the UN Sustainable Development Goals (SDGs) as a framework to measure how we contribute to a safer and more sustainable world.



LR has a long-standing reputation for providing technical expertise and assurance to ensure businesses are safe, secure and sustainable. Our activity aligns with the UN SDGs, however we are focussed on the following eight goals:



We are committed to working with customers for resource-efficient, responsible and traceable supply chains and our profits are used to fund research into innovative sustainable food solutions.



We recognise health in all its forms as a human right and we are committed to focussing on both health and well-being and the safety of our people and their families. We proactively promote healthy behaviours that in turn support good mental health and resilience.



We believe in diversity and inclusion at all levels within the organisation, and acknowledge the influence we can have at a systemic level within the engineering profession to redress the balance and make sure opportunity and reward is equal.



We recognise that radical innovation is needed to stay within the climate boundaries of the Paris Agreement, and are committed to helping the necessary transition from hydrocarbons to clean energy and working towards global carbon reduction targets.



We are committed to getting our people home safely to their families every day. We provide safe working environments and work to improve public safety using our influence to enhance safety standards wherever we are in the world.



We are committed to making supply chains more transparent and resource-efficient, providing real-time assurance and data-driven recommendations to drive efficiencies through reduced water usage, energy efficiencies and lean manufacturing.

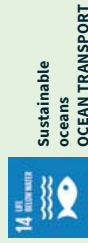


We are dedicated to working with our clients to transition from fossil fuels to renewable sources of energy and jointly tackling the global challenge of climate change, steering our collective transformation to no carbon operating models.



Our efforts are focussed on helping to achieve the International Maritime Organisation's (IMO) target to decarbonise shipping by 2050. We are partnering with senior leaders in the maritime, energy, infrastructure and finance sectors in the Getting to Zero Coalition.

In 2018/19, we focussed our efforts primarily on three SDGs aligned to the UN's Action Platform for Sustainable Ocean Business. Please read below for our progress so far:



**We achieve this by:**

- Over 20,000 safety inspections on ocean-going vessels a year.
- Assessing fisheries on every continent and in 40 countries to the MSC Fisheries Standard.
- Zero-emission vessels research and publications to help understand the pathways to decarbonisation.
- Ship recycling facility assurance and transparency initiative (SRTI) to improve human and environmental health.
- Collaboration with Sustainable Shipping Initiative (SSI) and the Global Maritime Forum (GMF).



**We achieve this by:**

- Supporting the production of energy with zero or low-carbon emissions, including on/offshore wind, wave, nuclear, solar and energy storage.
- Risk management, engineering dynamics, and independent certification and verification services for offshore wind projects.
- Helping to develop and prove new low-carbon technologies using a Technology Qualification approach.



**We achieve this by:**

- Offering visibility and insight to our customers that enable them to develop safe, sustainable and transparent supply chains.
- Helping to improve efficiency and reduce costs of supply-chains, whilst maintaining compliance and being socially responsible.
- Assessing ISO standards and GHG reporting in particular – ISO14001 / 14064 / 45001 / 50001.
- We are a globally listed Sedex Members Ethical Trade Audit (SMETA) provider delivering responsible sourcing audits worldwide.

**What we have achieved in 2018/19:**

- Founding member of the UN's Action Platform for Sustainable Oceans Business, collaborating on development of the 'Principles of Sustainable Oceans Business'.
- Founding member of the Poseidon Principles to integrate climate considerations into lending decisions.

As a signatory to the United Nations Global Compact principles we report annually via a Communications on Progress (COP) and are developing a framework and a methodology to track and assess our progress in 2019/20 as we continue to embed the SDGs and prioritise contribution.

**What we have achieved in 2018/19**

- Supported almost 1,000 projects that have a total generating capacity of 54 GW, more than the typical peak electricity demand for the UK.
- Clean Energy strategy in development.

**What we have achieved in 2018/19**

- Providing assurance to 30% of top 150 retailers and producers.
- In the last 12 months – 50,000 audits, trained 100,000 internal auditors and food safety professionals.

# Oceans: a key battleground in the fight against climate change.

LR has a long heritage of working with the oceans, dating back to our founding as a marine classification society in 1760. Today, our oceans have become a key battleground in the fight against climate change, as we seek to reverse the negative impacts on biodiversity, ecosystem health, critical habitats and coastal communities, and improve the sustainability of all ocean industries.

A recent report from the Intergovernmental Panel on Climate Change (IPCC) found that oceans have absorbed 93 per cent of the heat trapped by human-generated CO<sub>2</sub> emissions, and the UN predicts that this ocean acidification will cause serious consequences for marine life by the end of the century. Improving the health, cleanliness and productivity of the world's oceans is not just vital because they provide 50 per cent of the world's oxygen, or because three billion people's livelihoods depend on them, but because more sustainable oceans have been identified as a vital part of the solution for stopping climate change.

New work by the World Resources Institute (WRI) found that oceans could deliver up to 21% of the annual greenhouse gas (GHG) emissions cuts that the world needs by 2050 if a number of key opportunities for action are taken.

LR is already helping to deliver on these actions, according to Suzanne Johnson, Vice President, Corporate and External Affairs at LR: "A majority of our clients operate in the ocean transport, ocean food and ocean energy sectors. We view the ocean as a massive resource for sustainable development. Using our deep expertise and experience and enabled by innovative and novel technologies, our work to drive improvements in safety, resilience, assurance and sustainability across the oceans is already delivering against the WRI's actions to cut GHG emissions.

"We are partnering with highly influential organisations and institutions that are developing and supporting solutions for better ocean health and wealth. We are a founding member of the UN Global Compact Ocean Action Platform, on the Advisory Council of the Global Maritime Forum (GMF) and work with the Friends of Ocean Action."

**Ocean transport**

According to Katharine Palmer, Global Sustainability Manager, Marine & Offshore at LR: "Fully decarbonising the shipping sector is one of the world's biggest challenges; it has the potential to be the most disruptive transition that shipping has had to deal with."

LR is prioritising decarbonisation within the shipping and maritime sector, transitioning to a safe and more sustainable approach for the design, construction, operation and recycling of ships. Katharine explains: "We are partnering with a number of senior leaders in the maritime, energy, infrastructure and finance sectors in the Getting to Zero Coalition, which has the ambition of having commercially viable zero emissions vessels operating along deep sea routes by 2030."

LR is also playing its part to support the Sustainable Shipping Initiative's (SSI) vision for better social, environmental and economic impacts by 2040. This includes encouraging a system change so that sustainable performance is rewarded by the industry, which will encourage large-scale uptake of innovation, technology, design and operational efficiencies.



**Robust assurance verification means you can visibly demonstrate that your business meets the safety, quality, social and environmental compliance requirements of both manufacturers and the public.**

**Polly Burns**  
LR Fisheries Manager

**Ocean food**

Aquaculture is the fastest-growing food-producing sector in the world. As Polly Burns, LR Fisheries Manager explains: "Consumers are increasingly looking for sustainable choices for seafood and fish farms now provide almost as much of our seafood as commercial wild fisheries."

"Robust assurance verification means you can visibly demonstrate that your business meets the safety, quality, social and environmental compliance requirements of both manufacturers and the public."

LR delivers assurance against Aquaculture Stewardship Council (ASC) and Marine Stewardship Council (MSC) certification, a signpost to retailers and consumers that producers are minimising the environmental and social impact of their activities, while meeting industry best practice. We are working to advance current practices in aquaculture, combining the in-depth knowledge and technical expertise of our marine, offshore and food specialist teams.



**Ocean energy**

With the energy transition in full swing, we are helping to remove the barriers to scaling up ocean-based energy sources, primarily offshore wind and supporting investment in new, innovative sources such as floating solar photovoltaics, wave and tidal power.

“Our clean energy strategy and commitment to offshore wind development is helping to improve the efficiency of both the production and use of energy,” says Tristan Chapman, LR’s Senior VP Renewables and Innovation.

“Our extensive sector knowledge, experience and networks are providing customers with a clear understanding of the offshore wind market, the regulatory regime and the business opportunity.”

Driven by developments in technology, the cost and risk of installation for offshore wind farms is lowering and offshore wind is subsequently getting cheaper, recently becoming cheaper than the wholesale price of energy in the UK for the first time. We are bringing cutting edge thinking to solve the issue of connecting the renewable energy generated with the rest of the grid.

The US is less mature in its offshore wind journey, and has huge ambitions to grow in the northeast of the country. LR is working closely with a large number of customers to create the necessary supply chain and building infrastructure to support sustainable offshore wind development and unlock the potential of this market.

LR is using its deep domain expertise to contribute to the shift towards hybrid energy solutions, including helping oil and gas operators to decarbonise their upstream production facilities and developing new ways to use existing infrastructure in order to reduce the huge cost and impact of decommissioning.

**Leading the Blue Revolution**

While land-based agriculture has been successfully industrialised over the past 10,000 years, the same has not been done for the ocean. Though 70 per cent of our planet is covered by the oceans, they contribute just five per cent of our food. Work to grow that figure has been termed the Blue Revolution.

LR’s contribution to the Blue Revolution includes developing a concept for ‘multi-use of the marine space offshore’, using existing wind farms and co-locating them with aquaculture food sources to industrialise food production at sea. This will help to ease the burden of population growth while simultaneously optimising the cost of offshore renewable energy production.

Suzanne is in no doubt about the huge opportunity for growth and development that the Blue Revolution provides. “Plant life, seaweed, shellfish and fish should all be considered viable alternatives to land-based protein sources. The WRI estimates that if just two per cent of the oceans – an area roughly the size of Australia – was dedicated to growing and producing seaweed as a food source, it would produce enough proteins for 12 billion people, with no need of animal or vegetal proteins,” she says.



**Our extensive sector knowledge, experience and networks are providing customers with a clear understanding of the offshore wind market, the regulatory regime and the business opportunity.**

**Tristan Chapman**  
Senior VP Renewables and Innovation, Energy at LR

“Aquaculture does not need land, nor freshwater, nor fertilisers. Sustainable production practices, including moving away from fish-based foods towards those based on plant products, are required along with environmentally sensitive developments which minimise impacts on coastal ecosystems.

“There are major challenges to overcome, such as ensuring the safety of the infrastructure and employees in areas that are hard to reach and monitor. The need to produce more food for burgeoning populations in a sustainable way more than justifies these efforts.”



**The WRI estimates that if just two per cent of the oceans – an area roughly the size of Australia – was dedicated to growing and producing seaweed as a food source, it would produce enough proteins for 12 billion people, with no need of animal or vegetal proteins.**

**Suzanne Johnson**  
Vice President, Corporate and External Affairs at LR



**We remain fully committed to investing in changing this very real and very difficult problem for the shipping industry, thus providing owners with a destination for recycling their vessels in a safe and sustainable manner.**

**Naeem Masani**  
YSI Recycling



**CASE STUDY**

**Recycling ships, safely and securely. First fully compliant recycling facility in India.**

**The challenge**

Dismantling ships is one of the most dangerous professions in the world, both for workers and the environment, with high levels of fatalities, injuries and work-related illnesses stemming mainly from hazardous materials on board.

The Hong Kong Convention for Safe and Environmentally Sound Recycling of Ships (HSC) and the EU Ship Recycling Regulation (EU SRR) now provide a framework to ensure that end of life ships are dismantled safely with minimum impact to human health and the environment.

**The solution**

In Alang we worked with our customer, YS Investments (YSI), to achieve a first in India: a Ship Recycling Facility that is fully compliant with the HSC and the EU SRR. Because of our guidance and ‘firm but fair’ approach carried out under LR’s Audit During Recycling (ADR) scheme, YSI renovated the whole facility to improve safety and environmental impact.

We are also the only class society involved in the Ship Recycling Transparency Initiative which aims to incentivise responsible ship recycling practices by the simple act of companies being transparent about their approach to recycling.

**The result**

By using LR’s guidance, YSI made all its beach areas impermeable to avoid leaching of pollutants into land and water at the intertidal zone, built dormitories and health facilities for its workers, brought in cranes and lifting equipment to safely move large sections of ship, and they invested in training to effect the changes required of their management system and processes. After obtaining the Certificate towards Hong Kong Convention, YSI has responsibly recycled more than 40,000 Metric Tonnes of end-of-life vessels.

**We’ve achieved**

Between 2015 and 2019 we have worked with:



We are also the class society involved in the Ship Recycling Transparency Initiative which aims to incentivise responsible ship recycling practices.



**Facilities**



**Owners**



**Where we want to be**

**30%**  
of ship recycling globally under LR’s certified recycling



The IMO's target means ZEVs need to enter the world's fleet in 2030 and time is extremely tight to develop the necessary zero-carbon fuels and associated technologies to make this happen.



CASE STUDY

**Decarbonisation of shipping – zero-emission vessels (ZEVs) and Poseidon Principles.**

**The challenge**

Shipping accounts for 2.3% of global CO<sub>2</sub> emissions and in line with the temperature goals of the Paris Agreement, the International Maritime Organization (IMO) has set a target for shipping to achieve an absolute reduction in greenhouse gases (GHG) of at least 50% by 2050; this equates to around 85% reduction in carbon intensity.

Ships are highly capital-intensive assets with typical operating lives of 20-30 years, longer for some ship types. The IMO's target means ZEVs need to enter the world's fleet in 2030 and time is extremely tight to develop the necessary zero-carbon fuels and associated technologies to make this happen.



Fully decarbonising the shipping sector is one of the world's biggest challenges; it has the potential to be the most disruptive transition that shipping has had to deal with.

**Katharine Palmer**  
Global Sustainability  
Manager, Marine &  
Offshore at LR

**The solution**

While there are energy efficiency improvements available now to help move us towards this goal, they will not be enough to achieve it fully. A transition from fossil fuel-based operating models is essential and, the longer we leave it, the more disruptive it will be.

This is why we have, in collaboration with University Maritime Advisory Services (UMAS), published a series of reports on zero-emissions, looking at fuel and technology trends for the marine industry, identifying milestones for the safety, technical, social, economic and environmental aspects of the potential ZEVs.

**The result**

Aimed at developing new knowledge and tools that can contribute to policy debate, we have shared this cutting-edge research to encourage a broader understanding of global issues that affect the marine industry and their impact e.g. Low Carbon Pathways 2050 and ZEVs 2030 reports.

We are also supporting incentivisation and innovation across the industry as the sole classification society involved in the Poseidon Principles, an initiative led by a group of the major banks designed to encourage lending decisions that promote global decarbonisation of shipping. The 11 founding signatories represent a bank loan portfolio of approximately \$100 bn and around 20% of global ship finance.

# How LR's approach to Industry 4.0 is building trust and resilience in supply chains.



**Evaluating new technology and producing guidance on how to apply it safely is what we have always done, across all of the sectors we work in.**

**Phillipa Chariton**  
Marketing Director,  
BA&S at LR



**We are helping some of the world's largest food and hospitality businesses to extract value from their data and address threats to their in-house food safety, health and safety, sustainability and supply chain standards. We do this by delivering bespoke solutions combining technology, data analytics and deep technical expertise.**

As it has developed, Industry 4.0 technology has enabled businesses to gather an ever-increasing amount of data. However, the challenge has been in deciphering the potential lessons hidden within the numbers. Leveraging big data effectively to gain insights that can lead to safety, quality and productivity improvements requires both broad industry knowledge and the ability to customise solutions to an individual customer's exact needs.

A large component of Industry 4.0 seeks to use always-on sensors embedded in machines to transmit real-time data to networked IT systems. In turn, these systems apply machine learning and artificial intelligence algorithms to analyse and gain insights from the data and adjust automatically.

In response, LR is working to assure and qualify these new Industry 4.0 ecosystems. It is analysing how they are changing industries, making sure those changes are safe and understanding how we can use that data to support compliance. This is the journey to 'Assurance 4.0'. As LR's BA&S Marketing Director, Philippa Chariton, points out: "Evaluating new technology and producing guidance on how to apply it safely is what we have always done, across all of the sectors we work in."

### How LR is delivering Assurance 4.0

LR is working with brands to build trust and resilience in their supply chains through customised assurance, going beyond simple certification. Customised assurance means delivering solutions that are specifically designed to meet a customer's immediate needs, future targets and risk reduction plans, whilst always pushing them to look further ahead and be ready for the next challenge.

Stuart Kelly, Global Head of Commercial in BA&S's Customised Assurance division, explains: "We listen to our customers and challenge their thinking to identify and agree clear needs. We then create bespoke programmes and solutions that move at the client's desired pace. We use the results and insight gained to recommend changes that will further drive assurance and brand integrity. We understand that one size does not fit all and believe in building long-term partnerships based on trust and results."

LR's solutions are enabling businesses to translate their data into meaningful and risk mitigating actions and audit programmes, all supported by insight-led technical account management and underpinned by real-time data from its customer portals and dashboards. Investing in technology and digital innovation is key to creating solutions that can match both the pace of Industry 4.0 development and evolving consumer requirements. However, this has to be matched by a high level of technical expertise and industry experience.

"The similarities between different sectors allows us to pool resources and learning," Stuart explains. "We work to provide aggregated risk views for customers and act as their expert support who can spot and predict issues or suggest optimisation through our view across so many systems and industries."

### Assurance within the food sector

Though quality, origin and contamination are problems in many sectors, there are a wide range of additional challenges and complexities when delivering assurance for the food sector. As the wider public becomes more aware of the importance of ethical sourcing, human rights and the risk of food fraud and substitution, the trust of the consumer is vital.

Plastic reduction and elimination and waste reduction are key areas of focus as we come under increasing pressure to feed the world's growing population with limited resources. Real-time monitoring and the use of AI to predict and alert to potential risks before they occur is another goal for the food sector, when preventing a product recall can potentially save millions in costs, time, waste and brand reputational damage.

Though audit and certification will still have a huge part to play in the food sector, the leaders of tomorrow will be looking for increasingly innovative digital solutions, such as 24/7 monitoring of critical information using different interventions such as remote auditing of key risks, micro learning and risk modelling.



### Cybersecurity

With the rapid spread of Internet of Things (IoT) platforms and other sensors, the world is increasingly dependent on interconnected operating technology. This technology was once entirely separated from the internet and was neither designed nor installed with cybersecurity in mind. As it moves online, it inevitably becomes exposed to cyber threats.

Faced with the growing need for information and operational technology security, LR acquired cybersecurity specialists: Nettitude in 2018. Nettitude focuses on delivering threat-led services for our customers, helping organisations to understand vulnerabilities across their people, process, data and technology assets. By delivering sophisticated attack simulations, Nettitude also supports organisations in maturing their detection and response capability.

Rowland Johnson, CEO of Nettitude, explains: "The greatest challenge is the rate of expansion of new technology, with old models of cybersecurity having to rapidly evolve to keep up with the increasing number of devices, applications and data. The explosion of data stored in the cloud, which is also being made available to customers and the wider supply chain, means the attack surface that was once well defined is now amorphous in nature."

With new IoT devices being launched every day, organisations' reliance on data presents new and unparalleled risks to organisations across the globe. Much like Assurance 4.0, Rowland adds "We are using our expertise in cybersecurity to develop new and innovative approaches that harness machine learning to address the vulnerabilities in people, process, data and technology."

### CASE STUDY

## Using real world threat intelligence to protect against cyber attacks.

### The challenge

The world we live in is adapting and becoming more reliant on technology and data. While this brings many positives to our personal and professional lives, it also leads us to a time of unprecedented risk.

There is a lack of understanding across businesses of how a cyber attack could affect their critical business systems operationally and financially and failure to manage cyber risks leaves organisations open to attacks and costly data breaches.

### The solution

Following the acquisition of award-winning cybersecurity specialists Nettitude, LR now offers a wide portfolio of cybersecurity assurance services designed to help customers identify, protect, detect, respond and recover from cyber threats. An example of where Nettitude can help is using the Red Teaming assurance test which builds on penetration testing by having a much wider scope and remit both in terms of attack surfaces looked at and in the level on controls that are tested. Over a period of 10 weeks we can run a scenario-based simulation against critical systems for any client. This is based on in-depth investigations, realistic simulations and detailed analysis of the customers' ability to defend, detect and respond to three cyber scenarios.

### The result

As the Red Teaming test is built on real world threat intelligence, the scenarios are simulated and then detection and response rate evaluated. This delivers pragmatic and realistic insights to key stakeholders to help them focus on remediation effort, maturity and improvement planning to help protect their business.



LR has assessed fisheries on every continent and in 40 countries to the Marine Stewardship Council (MSC) Fisheries Standard and together with the ASC standard has certified more than 100 species of seafood.



CASE STUDY

**Ensuring sustainable seafood choices.**

**The challenge**

The world's oceans are under increasing pressure from threats such as climate change and overfishing, whilst consumers are increasingly looking for sustainable choices for seafood. A rapidly growing requirement for sustainable protein is driving demand that is increasingly being met by aquaculture fish farms which now provide us with almost as much of our seafood as commercial wild caught fisheries.

The need to mitigate the environmental impacts of fishing and aquaculture are increasingly in the public consciousness. This combined with the globalisation of food chains and suppliers mean that the complexity and potential risks of the seafood product business have increased.

For seafood producers, it is important to meet the safety, quality and social compliance requirements of manufacturers and indeed the consumer who wants to know that the seafood they eat is safe and sustainably sourced.

**The solution**

It's therefore essential that the sector implements systems to ensure it continues to meet not just consumption requirements, but also environmental and social criteria. Shining examples of best practice are the Aquaculture Stewardship Council's (ASC) farm fish standard, the leading standard for the farmed seafood sector, and the Marine Stewardship Council (MSC) fisheries standard.

LR delivers assurance against ASC and MSC certification, a signpost to retailers and consumers that producers are minimising the environmental and social impact of their activities, while meeting industry best practice. Robust assurance is the common thread that links the challenges facing organisations today and helps build a sustainable future for us all.

**The result**

Through rigorous and thorough assessments, we have helped to drive sustainability changes across many global fisheries ensuring fish populations are productive and healthy, that impacts on other species and habitats are minimised to ensure a healthy ecosystem, and that fisheries are effectively managed through ongoing environmental and legal changes.



# Industrial Internet of Things (IIOT) is driving new ways of managing performance and risk.



Operators are calling for expert engineering solutions that provide comprehensive, accurate and up-to-the-minute information on asset and plant performance.

**Dr. Neil Arthur**  
Technical Director,  
Digital at LR

## Recent advances in IIoT, machine connectivity, big data and cloud technology have created some promising new ways to assure asset integrity and provide a holistic, real-time understanding of operating assets to optimise production and operating costs, while minimising risk.

Safe and reliable operations are both moral and business imperatives. Balancing performance and cost with risk is challenging in a dynamic environment; businesses need to be confident that threats to safety, productivity and the environment have been mitigated, while maximising output. Yet recent events, such as the Philadelphia refinery explosion and the Baytown plant fire in the US, are evidence that more needs to be done to avoid catastrophic incidents.

The greatest fear for operators is not knowing the areas of exposure to risk, and therefore not being able to address them. As LR Technical Director Digital, Dr. Neil Arthur, says: "Organisations have huge repositories of structured and unstructured data, but many struggle to access the richness of insight that can be gleaned from their historical maintenance records and process readings. Operators are calling for expert engineering solutions that provide comprehensive, accurate and up-to-the-minute information on asset and plant performance, along with assurance that risks have been identified and can be addressed through preventative maintenance actions."

In heavy process industries such as oil and gas, power, chemical and petrochemicals, as well as in the maritime sector, planned maintenance has traditionally been undertaken at fixed intervals. But periodic inspections may be too early or too late to identify problems. Time and money may be spent on non-critical assets, while other components are not tested frequently enough. It can also be difficult to take account of the operating environment or circumstances affecting operators, such as fatigue.

### Industry 4.0: a dynamic approach to asset performance and risk management

Recent advances in IIoT, machine connectivity, big data and cloud technology have created new opportunities and some promising new ways to assure asset integrity and provide a holistic, real-time understanding of operating assets to optimise production and operating costs, while minimising risk. These include predictive analytics, quantitative maintenance optimisation and digital twins.

**Predictive analytics** and risk modelling have the potential to take asset performance and maintenance to new levels through the extraction and analysis of valuable information from previously unmanageable pools of historical and real time data. Artificial intelligence (AI) and machine learning (ML) can further enhance this capability to deliver unprecedented insights into the true state of assets.

**Quantitative maintenance optimisation** allows modulation of maintenance activity in response to the changing reliability, economic and safety performance of assets. A 'live' model of the facility is developed, and planned maintenance activity scaled in response to changes in the prevailing technical and commercial environment. LR Technical Director Energy, DJ Schuld points to substantial gains from adopting this approach. "Many of our customers have seen a net reduction of 30% or more in planned maintenance through adopting these techniques."

Automating this approach through AI and ML will allow large-scale maintenance optimisation and performance benchmarking at pace. DJ sees particular value in benchmarking when the causes of risks are unclear. "Typically 35% of risks in a facility are unknown, with root cause analysis of limited value on account of the operational complexity. In situations such as this, benchmarking across organisations and sectors can be of significant value, and with our long history and the breadth and depth of our expertise, LR is uniquely placed to develop the data libraries required."

**Digital twin models** have the potential to transform the performance of assets by using new risk and reliability methodologies; failure data libraries, modelling tools and advanced analytics to process huge amounts of inspection, maintenance and other data. Digital twins enable users to test alternative prescriptive strategies by doing what-if tests in the digital model and then deploying the strategy once proven to the asset's physical twin. LR has extensive experience in digital twins and recently launched its Digital Compliance capability, providing an assurance and approval framework for Digital Health Management system providers and operators applying digital twin technology.



The real value lies in bringing together technology and human intellect to interrogate and extract value from vast data sets, to generate actionable insights that pinpoint risk and enhance asset performance – improving our understanding of the past and present to predict and inform the future.

**Dr Maurizio Piliu**  
VP Digital Innovation  
at LR

A key enabler to increased adoption of these approaches are the rapid advances made in sensor technology, with costs falling at a staggering pace and ever simpler installation. As sensors become more pervasive, remote monitoring and the automated analysis of data will become the norm. VP of Digital Innovation at LR, Dr. Maurizio Piliu is clear that technology and data are only part of the solution. “The real value lies in bringing together technology and human intellect to interrogate and extract value from vast data sets, to generate actionable insights that pinpoint risk and enhance asset performance – improving our understanding of the past and present to predict and inform the future.”

**Adapting business models from other sectors**

Aside from the advances made in sensors and data analytics, adoption of business models from other sectors can be a game changer in helping organisations to reduce risk. Maurizio says: “For example, deploying drones is an increasingly common way to avoid exposing humans to potential harm, and we are seeing development of Uber-like platforms for drone inspections that match client requirements with suitable providers.”

Semi-autonomous drones that will be capable of relaying camera inspection data and the associated 3D models to businesses such as LR, which are expert in analysing the information, are under development.

**Working in partnership**

In an environment of ever increasing scrutiny of performance and risk, as new technologies and approaches are developed, the importance of collaboration and open innovation is also increasingly apparent. As Maurizio puts it, “One of LR’s core strengths is the ability to turn data into knowledge into value, and we have exceptional insights into sectors and customers around the world. We are uniquely positioned to be able to work with customers in an impartial way to select best-in-class technologies, and to develop solutions to extract insights.”

An example of collaboration with external cutting-edge technology partners is the LR Safety Accelerator, a partnership between the Foundation and LR. The Safety Accelerator was set up to help large companies with some of the toughest safety and risk problems: identify potential solutions from among some of the world’s brightest entrepreneurs and technology start-ups.

**Adopting the right approach for customers**

Industries – and individual organisations within them – are moving at different speeds. Some are leapfrogging solutions to adopt the latest technologies, while others prefer to extract value from investments they made ten to fifteen years ago, and are reluctant to invest in new approaches.

As Neil Arthur concludes, “Whatever a customer’s asset management strategy, our unique ability to bring together deep expertise developed over our long history across sectors and regions with solutions at the forefront of the field makes us a trusted partner to support customers, whatever their needs.”



**CASE STUDY**

**LR delivers world’s first Safety Accelerator.**

**The challenge**

Maritime and offshore, energy and supply chain industries are some of the most dangerous in the world, posing risks to workers, property and the environment. While safety improvements have been made, a gap exists for new approaches, to drive down accidents in these sectors.

**The solution**

Recognising this need for change, the LR Safety Accelerator was launched in 2018, by LR and the Foundation, run in partnership with Plug and Play, the largest global innovation platform and most active venture capital fund in Silicon Valley. The programme connects start-ups and customers to work together developing highly innovative digital solutions to improve safety and reduce risk.

Working in collaboration with LR customers to identify tough safety and risk challenges, the Safety Accelerator then expertly sources innovative start-ups capable of solving these challenges. After a rigorous selection process, successful startups pilot their solution with the customer in a three-month live environment.

**The result**

The programme has facilitated 10 ‘safetech’ pilot projects to address safety and risk challenges in collaboration with LR customers including Kotug, Pacific International Lines, Omexom, Scorpio, Shell, Benuo, Wallenius Wilhelmsen, Bernhard Schulte Shipmanagement and HSE’s Discovering Safety Programme, and is currently running its fifth round of challenges with DCP Midstream, Phillips 66 and PepsiCo. 400 start-ups from all over the world have applied to solve the challenges, with 40 finalists pitching in front of customers and LR experts.



**400 start-ups from all over the world have applied to solve the challenges, with 40 finalists pitching in front of customers and LR experts.**



Many of our customers have seen a net reduction of 30% or more in planned maintenance through adopting these techniques.

**DJ Schuld**  
Technical Director Energy  
at LR



Optimised centrifugal pump maintenance, with an estimated annual saving of 400,000 Norwegian Krone.

**CASE STUDY**

**Aker BP: Using data intelligently to cut planned maintenance in half.**

**The challenge**

Aker BP is a well-established exploration and production company, with activities on the Norwegian Continental Shelf (NCS). Measured in production, our client is one of Europe's largest independent oil companies, employing a workforce of around 1,300 people.

As an energy leader, the company was keen to see how it could make the most of its real-time equipment data to safely reduce maintenance workloads and spending. Aker BP asked us to run a pilot project using the Skarv floating production, storage and offloading (FPSO) unit it operated as the test asset. The pilot focussed on two core maintenance areas – the FPSO's centrifugal pumps and its fire and gas detectors – covering a total maintenance history of 60 months. The objective was to quickly demonstrate the business benefits of our recommended approach, combining our data and engineering expertise with our LR AllAssets™ Maintenance Optimisation software solution.

**The solution**

The close, collaborative approach made full use of our client's existing data sets for the Skarv FPSO and LR AllAssets™ Maintenance Optimisation solution.

- The project was broken into three main stages:
- Gathering asset information from our client, including maintenance history, maintenance procedures and criticality ranking of every item of equipment under investigation
  - Analysing and reviewing the information using different strategies and methods for each equipment or device type
  - Optimising test intervals using LR AllAssets™ Maintenance Optimisation software and expertise, with supporting maintenance findings, insights and recommendations

Using our sophisticated, risk-based algorithms, and extensive engineering knowledge across reliability and maintenance optimisation, we then analysed the data to determine the most effective maintenance strategies.

**The result**

The project delivered almost immediate results and return on investment for Aker BP, with several major benefits:

- Full maintenance cost transparency
- Optimised centrifugal pump maintenance, with an estimated annual saving of 400,000 Norwegian Krone
- Reduced the annual maintenance hours/cost for fire and gas detectors by more than 50% by optimising test intervals and reducing inspection activities
- Maintenance activities refocussed in key areas for improved production availability



# A purpose-driven workplace.



Working together for a safer world lies at the heart of why we exist and what we strive to achieve.

We care about each other, our customers and the environment. We share our expertise, and we do the right thing, even if it means making difficult decisions. Our *Stop Work Authority*, which empowers everyone at LR to stop work if they feel that there are unacceptable health, safety or security risks, is just one example of this.

We are wholly owned by the Foundation, formed in 2012, and as the commercial trading arm our work funds this unique global charity. Working jointly, we have invested in public safety research and have funded vital projects in fields such as deep learning, AI and marine construction.

We know that how we deliver is as important as what we deliver. Our values underpin our culture, help shape our spirit, attitude and they are what guides us.

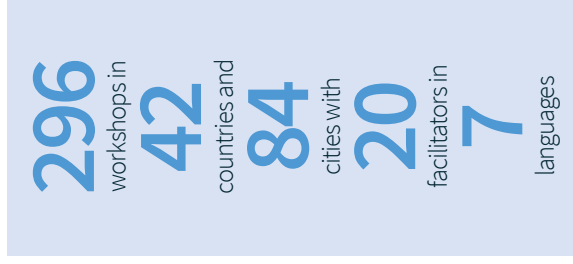


### Improving our culture

Our values inspire us to respect each other and the wider communities we work in. Our *Be the Change* programme is an initiative designed to make sure that LR's global culture is as progressive and inclusive as possible. As a supplier, we know we need to be easy to do business with – as focussed on our customers' commercial drivers as we are on their technical needs. As colleagues we know how important a truly diverse and inclusive team is and we're learning to be more open-minded, collaborative and appreciative of each other's perspectives to create a sense of belonging and with it a high-performing and innovative culture.

### Be the Change

More than 6,000 colleagues attended *Be the Change* between 2016 and 2019



### Diversity and Inclusion (D&I)

There are no shortcuts to creating a diverse business, but a genuinely inclusive business automatically becomes diverse over time. By putting into practice our D&I strategy and three year-plan, we aim to demonstrate through actions and transparent metrics that we're committed to creating an inclusive culture based on our vision:

- At LR, we believe that we deliver better and more sustainable results when different perspectives shape our thinking.
- Our global teams, and increasingly our leadership, should reflect the communities we operate in and the global marketplace we serve.
- LR is dedicated to being an inclusive place to work, where everyone can make a difference and give their best.

Based on current performance we know that we are at the start of this journey. We are committed in reaching the following targets in 2020.

| Outcome                                       | Measure   | Current    | Target            |
|---|---|------------|-------------------|
| Increase women in leadership roles            | Proportion of female leaders (grade 4a and above) | 21% female | 25% female (2020) |
| LR leadership reflecting our global footprint | Proportion of non-British senior leaders          | 51%        | 60% (2020)        |



**Competence creates winning safety culture**

At LR we are acutely aware of the importance of safety no matter where we are, but this is particularly true in potentially hazardous situations. In response to a series of high potential incidents, LR created a dedicated training programme to improve the competency of our personnel to safely undertake high-risk activities.

There are 10 LifeSavers modules, each of which relates to a high-risk activity that field-based colleagues face. These activities include working at height, entering confined spaces or boat transfers. Each LifeSaver provides clear guidance on the minimum requirements. They simplify each requirement by breaking down high-risk activities into a series of behaviours and actions that are easy to understand.

**LifeSavers Modules**

1. Trained and competent for work
2. Risk-Assessment and Stop Work Authority
3. Confined Space Entry
4. Fall Prevention
5. Stored Energy
6. Pressure Testing
7. Driving
8. Working Over Water
9. Safe Body Positioning
10. Emergency Preparedness

Because no training programme was provided for these risks, we had to create a new dedicated syllabus and then source global providers. Over a 10-month period we identified and visited 24 technical training schools to review their capability and willingness to partner with us to develop a bespoke training course.

Eight training centres were approved and appointed in each region of world, all of which could deliver a consistent training course. This ensured that regardless of the location of our employees, any local legal standards or the individual's level of competency, they would have a consistent learning experience.



**We've worked hard to develop our safety culture and it's great to see our safety efforts being recognised by a customer and particularly an organisation as safety conscious as Shell.**

**James Pomeroy**  
Group HSES Director

**LifeSavers has been recognised by a major operator for the second year running.**

Shell runs safety awards for its suppliers each year. In 2018, we co-won the Maritime Partners in Safety Award, in recognition of the impact our LifeSavers have had.

We've gone one step further this year, winning Shell's Best Behavioural Safety Initiative award at the 2019 Safety HSSE Contractor Awards. The judges were impressed with our practical training initiative and our entry with the theme, 'Competence Creates Culture'.

Our submission talked about the importance of procedures, technical competency and acting safely in creating the right behavioural culture. It also detailed how we developed our training programme in response to feedback from surveyors, which said they felt their competence would significantly improve with practical experience of potentially high-risk tasks – such as entering confined spaces and working at height – in a 'safe environment'.

Since launching the training programme in 2016 – which aligns with our LifeSavers and continues to be rolled out around the world – we've seen a 56% reduction in related incidents. Feedback from colleagues who have taken part, told us that 90% had changed the way the work and 93% felt better equipped to deal with hazardous situations as a result.



**93%**

increase in employee confidence



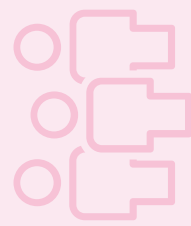
**56%**

reduction in HPOs (since the programme was initiated in 2016)



**90%**

change in employee behaviours



**2000**

employees to be trained worldwide by 2020

**Environmental programmes and emissions**

Our Green Shares behavioural change campaign was launched on World Environment Day 2018 focusing on the simple personal actions, or micro-habits, we can all take to make a difference to reduce our personal environmental footprints.

We used short and engaging videos, 'eco-talk' discussion generator material and visual content to run the year-long campaign focussing on four themes: reducing waste and recycling, energy efficiency, water conservation and low impact travel. The campaign concluded on World Environment Day 2019 with a global micro-habits competition where eco-themed prizes were awarded to the winners.

Our first focus was on finding ways to reduce, re-use and recycle the waste we all create. We explored the issue of single-use plastics, discussed their alternatives, and shared tips on how we can all ensure as little as possible of our waste ends up in landfill.

Next, we looked at ways to be more efficient with the energy we use. We provided tips to save energy - from simply switching off and unplugging the appliances we don't need, to thinking about how we heat and cool our environment, both at work and at home.

Our third theme was water conservation. We don't consume much water at LR, but there are still many things we can do to look after this precious and finite resource and our third focus area shared plenty of tips on how to do just that.

And finally, travel, LR's biggest source of carbon emissions and integral to the way we deliver customer services. For our last theme in our campaign, we considered ways to reduce the impacts from travel, asking that we challenge ourselves if we do really need to travel, whether it's by air or any other mode of transport. The simplest way to do our bit is to travel less and to travel smarter.

**LR greenhouse gas emissions:**

| GHG Emissions   | GHG 2017-18 | GHG 2018-19 | Change |
|---|-------------|-------------|--------|
| Energy efficiency (MWh / £m turnover)                                     | 26.4        | 23.2        | 12% ↓  |
| <b>Scope 1</b><br>Natural gas consumption GHG (tCO <sub>2</sub> e)        | 1,275       | 1,375       | 8% ↑   |
| <b>Scope 2</b><br>Purchased energy GHG (tCO <sub>2</sub> e)               | 7,007       | 4,997       | 29% ↓  |
| <b>Scope 3</b><br>Employee business travel – Air GHG (tCO <sub>2</sub> e) | 16,013      | 20,353      | 27% ↑  |
| Employee business travel – Car  | 4,731       | 3,275       | 31% ↓  |
| Water   | -           | 59          | -      |
| Total tCO <sub>2</sub> e  | 29,026      | 30,059      | 4% ↑   |



**Anti-bribery, corruption and fraud**

Our Code of Ethics contains a detailed Anti-Bribery and Corruption (ABC) policy and procedure, referencing our corporate Gift & Hospitality Register and our whistleblowing policy, *Speaking Out*. Its role is to ensure that everyone who works for or with a member of LR understands that unlawful or unethical business practices will not be tolerated.

Our ABC policy provides detailed advice and instructions on what is acceptable and what is not in terms of corporate entertainment. Instances of malpractice are required to be reported in accordance with the whistleblowing procedures.

Other LR ABC controls that have been put in place also include:

- Compliance online training and awareness programmes.
- All key suppliers have been issued LR standard contract forms to help ensure compliant ABC practice aligned with LR's policy.
- Regular auditing of LR's Gifts & Hospitality Register has been introduced and is conducted by the Technical Assurance & Quality team on a quarterly basis – a report is provided to the Ethics Committee.
- Due diligence procedures and have been developed and implemented by area business teams prior to the engagement of agents.
- An agency agreement template has been developed with controls to mitigate ABC risks.

To further enhance our approach to ethical and responsible business, an Anti-facilitation of Tax Evasion policy approved by the Ethics & Compliance Committee has been added to LR's Code of Ethics.

A dedicated ethics mailbox for reporting matters of concern is monitored daily and matters notified through our whistleblowing *Speaking Out* procedure.

**Responsible sourcing**

We have extended our environmental, ethical and social responsibility standards to our suppliers by deploying LR's Responsible Sourcing Policy (RSP). This defines the minimum standards that we ask our suppliers to respect and to adhere to when conducting business with LR.

These are not new requirements but rather a formalisation and explicit statement of our shared commitments to high standards of environmental, ethical and social responsibility performance within the supply chain. Acknowledgement of the RSP is a pre-requisite for major contracts for supply and in 2018/19 78% of our key contracts (>£100k spend) have signed LR's RSP or have equivalent arrangements in place.

# Our people.

**Whether it's global scope, world-class projects, or our strong sense of purpose, there are so many compelling reasons to join us and build a long-lasting career at LR.**



**Meet Amelia**  
**Business Innovation Architect**  
**Southampton**

Amelia Stead is Business Innovation Architect for Marine & Offshore (M&O) and based in Southampton, UK. She has been at LR for five years.

**Why did you join LR and why stay?**

LR's fundamental purpose initially appealed to me. With limited experience straight after completing my degree, I wasn't sure which type of role I wanted. The LR graduate scheme offered me the opportunity to spend time in different parts of the business to apply my engineering knowledge and develop my skills, with the benefit of learning about the energy and marine industries on a global scale. The variety of work at LR means that there are always opportunities to keep learning, whether that means specialising in one particular area or getting broader experience of our customers and industries.

**Describe a typical day at LR?**

My role is focussed at the front end of the innovation pipeline and how we are going to develop our innovation strategy for M&O. This means working with technical experts and the sales community to work with customers to really understand which areas we should be looking at. In terms of a typical day it might be organising innovation sessions at technical or external events engaging with customers about innovation, to prioritising which innovation activity we should be focussing on and finding customers to pilot projects with.

**What is your key highlight of 2018/19?**

At the M&O conference last summer we did our first innovation show for all the global sales leaders. We turned a room in a hotel into a dedicated interactive innovation space. It had taken time to set up a new team, establish ourselves and to develop projects we could show. It was a really proud moment to bring everything together into one room.



**Meet Henk**  
**Senior Geologist**  
**Aberdeen**

Henk Kombrink is a Senior Geologist based in Aberdeen. He has been at LR for five years.

**Why did you join LR and why stay?**

My role entails working on projects for customers who are seeking to narrow down on sites where to drill for oil or gas, inject CO<sub>2</sub> or produce geothermal energy. Collating data from the subsurface and coming up with a reconstruction of how things look deep below our feet is the best way to describe what I do on a daily basis. I joined LR because working in a dynamic environment where you interact with customers and never know what's round the corner attracted me. My drive is to create value for our customers and I feel very supported in doing so. I stayed because of the nature of the project work suits me very well, and working on projects is what we do most of the time! For instance, over the past three years I have been working on a big geological mapping project for the UK Government for which the results were made publicly available. A great way of seeing your work being used and available for the geological community.

**Proudest moment at LR?**

A colleague and I worked on a proposal for the Oil and Gas Authority (OGA). They are in charge of oil and gas licenses in the North Sea. We have done work for them for many years. This proposal was for a three year project that was quite important to win and would keep a number of us busy for a few years – it was quite critical. It was a three week manic exercise to get the proposal up to shape and we won it! That was a great achievement and we had the confidence from management to work on it and to submit it in the state we felt happy with it, and it was good to see that was appreciated.

**What is your key highlight of 2018/19?**

This summer we finished the project we won and in accordance with the expectations set by the OGA, on time and also on budget. A big team of us have worked on it over the years and it was quite a milestone to finish it. The client was happy and we had good feedback from them. Looking back over the last year this was probably the biggest thing to accomplish.



**Meet Michael**  
**Financial Planning and Analysis Manager**  
**Dubai**

Michael Roach is a Financial Planning and Analysis Manager for the Business Assurance stream for the South Asia, Middle East, Africa (SAMEA) region, based in Dubai. He has been at LR for a year.

**Why did you join LR and why stay?**

What attracted me to the company initially is that it is quite unique in its space, it's quite rare that you can have your expertise in a company that is owned by a charity, it feels like you are contributing towards a better world. I have the largest geographical area compared to my counterparts. It means different time zones, mentalities and cultures which is really interesting. Dubai is a cultural melting pot and I would challenge any other office to find as many cultures and languages in one area. Everyone from the Philippines to India, we have the English here, some Europeans, Dutch, Australians. You come across so many different nationalities that you never would have in previous walks of life.

The culture of trust is a really big attraction for me. I can make my own decisions and more importantly make mistakes! I can learn from them which has been really important for my growth. The appetite for knowledge here is great – it is a place where people develop people. It is a place where you don't just develop professionally, you develop personally as well.

**Describe a typical day at LR?**

It depends what time of the month! Normally it's a quick brief chat with the Area Operations Manager on what's been going on, we sometimes have an agenda on the hot topics we need to cover. After that it is further discussion with the service delivery and key operational teams to see how they are progressing on things like invoicing, accrued income. It is rare that one week to another is the same as there are always different issues to resolve so it keeps the role relatively fresh.



**Meet Gi-Hoon**  
**New Construction Business Support Manager**  
**South Korea/London**

Gi-Hoon Choi is a new construction business support manager in our Marine & Offshore business and has been at LR for 12 years. He supports our clients who are interested in building new constructions in North Asia. Usually based in South Korea, he is currently on secondment in London.

**Why did you join LR and why stay?**

I joined LR from another class society, and thought joining would give me more opportunities and experience because LR has so much history and technical expertise. Since I have been here, I have gained more experience and have been provided with many opportunities that have allowed me to progress from a Senior Surveyor to what I do now. I also value my colleagues who are really supportive. When I moved to London they helped me adjust to life here when I had never been here before, and I really appreciate that.

**Describe a typical day at LR?**

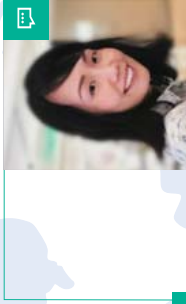
Most days I work with Korean clients or ship builders in London to maintain the relationship, as well as searching for new business opportunities. Sometimes clients need my technical expertise, at other times I am looking at different projects. Every day is busy!

**Proudest moment at LR?**

When I was a surveyor I was working on a particularly difficult project with a demanding client. During the construction there were many difficulties but I made every effort to solve all of the problems. When I completed the project the client decided to award my efforts, and I was really proud because I was recognised for the extra effort I had made to help resolve the issues.

**What is your key highlight of 2018/19?**

When I came to London for the first time, I did not have a good relationship with the clients here because they did not know me. It was initially very difficult to establish a relationship with them because they didn't perceive LR to be a partner, they saw us as a sub-contractor so they were not very friendly. However I kept approaching them and after six or so months, we now have really good relationships. I feel very proud of this achievement.



**Meet Jasmine**  
**Customer Experience and Performance Manager**  
**Singapore**

Jasmine Chen is a Customer Experience and Performance Manager in our Inspection Services team based in Singapore. She has been at LR for 15 years.

**Why did you join LR and why stay?**

My background is in marine and transportation. My professor really loved LR and kept promoting it, from talking about LR being the first classification society in the world, to defining standards and codes and improving safety.

When I was looking for an internship job I reached out to LR in China and Shanghai. The internship wasn't just the basic jobs, I was given a brilliant mentor who guided and mentored me, teaching me all about LR.

I head up two departments: customer experience and performance. I have had a lot of opportunities in terms of development and training and the biggest thing I feel is that I am totally trusted in my role.

**Proudest moment at LR?**

The biggest challenge I had when I first started was that it didn't feel open to people who had a non-technical background. They wanted everyone to understand the technical things and recruited people who had that understanding. The business was slowly starting to change and realised that non-technical backgrounds were really important. I was one of the first people to sit in a dedicated sales team. Although people were really friendly I did feel frustrated that people assumed that what I was doing wouldn't work – I had a choice, I could leave or prove it would work. I chose the latter and I am really proud that I proved them wrong.

**What is your key highlight of 2018/19?**

A really big moment for me was after being in sales for 11 years, I was given the opportunity to do innovation and project management for inspection services. I was then given the chance to move to Singapore in a new role which was completely outside my comfort zone. It has been a challenge, going into an area I don't know well but has really helped me to grow in terms of strategic thinking.

**Joanna Mycroft**  
**Senior Surveyor**  
**Sydney**

Joanna Mycroft is a Senior Surveyor, based in Sydney. She has been at LR for nine years.

**Why did you join LR and why stay?**

I never thought I would be in commercial shipping, I always thought I would be a yacht designer. I actually interviewed for a different position, and at the end of the interview got to talking about my honours thesis from university. At this point I was asked if I would be interested in coming back to interview for a different position the following week! I realised then that I didn't get the first job – but I was lucky enough to get the second one. It has been such a varied career in nine short years, from starting off in the 'rules and procedures publishing team', to now being based in a surveying team in Australia.

Mostly, it is the great colleagues I have. They are so willing to share their knowledge and help me to learn and progress. They inspire me every day. There are so many opportunities here to explore – so much room to learn – that I haven't wanted to leave yet. I have worked for the company on two different sides of the world. Every day is different and it is impossible to get bored. Finally, knowing that I work for a greater cause – the Foundation – is something that drives me every day.

**Describe a typical day at LR?**

I am one of very few people with a split role. Three days a week I am a shipboard surveyor and for the other two days I am a structural plan approval and project manager.

As a surveyor, I would be heading down to the ships, meeting the crew, doing whatever survey is necessary and completing related paperwork. If it is my structural plan appraisal job it is checking emails, reviewing the drawings, stamping them, calling customers to discuss any issues and then sending off the information for someone else to take the next step.

**Proudest moment at LR?**

When I do plan approval the boats could be built anywhere – Thailand, Spain, Americas, anywhere. When the surveyor on site posts a photo of the boat launched I always get a thrill of excitement.



## OUR BOARD

# Governing and directing our activities.

The Board of Directors and management leadership team work together to govern and direct our activities.

### Key

- Group Remuneration Committee
- Group Audit & Risk Committee
- Foundation's Nominations Committee

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| <p><b>Thomas Thune Andersen</b><br/>Chairman</p> <p>Thomas 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 Ørsted A/S, Vice Chairman of VWR Holding, the parent group of Velux and a Non-Executive Director of IMI plc and BW Group Limited. He is member of the World Economic Forum Chairman's Council.</p> | <p><b>Alastair Marsh</b><br/>Chief Executive Officer</p> <p>Alastair joined the Board in 2007 and was appointed Group Chief Executive in October 2015. He joined the Board as CFO and following a period of significant growth has now instigated Lloyd's Register's digital transformation strategy. Prior to joining Lloyd's Register he held senior finance positions at Superscape Group plc, Easynet Group plc, Laporte plc and NCR Corporation. Alastair is a chartered accountant with a degree from Edinburgh University. Alastair is also a Trustee of the Board and Chair of the Audit Committee of the Royal Museums Greenwich.</p> | <p><b>Mary Waldner</b><br/>Chief Financial Officer</p> <p>Mary joined Lloyd's Register in March 2016, having previously been Group Finance Director at Ultra Electronics plc. Before this Mary was Director, Group Finance at QinetiQ Group plc and Group Financial Controller at 3i Group plc. From 1998 to 2008, she held a number of senior roles at British Airways plc. She is also a Non-Executive Director and Chair of the Audit Committee at Oxford Instruments plc. Mary holds an MA in Physics from Oxford University.</p> | <p><b>Ellis Armstrong</b><br/>Non-Executive Director</p> <p>Ellis had an extensive career in the upstream oil and gas industry where he spent over 30 years with BP. He now has a portfolio of Non-Executive Board roles. In addition to Lloyd's Register, he is on the Board of Frontena Energy. He has a BSc and PhD in Civil Engineering and a Master's degree in Business Administration.</p> | <p><b>Caroline Firstbrook</b><br/>Non-Executive Director</p> <p>Caroline, a Canadian with a degree in electrical engineering and an MBA from Harvard, has worked for a number of professional services firms, and is currently COO at Clifford Chance LLP, a major law firm. She has a background in consultancy, particularly the development of corporate strategy, including managing 1,000 strategy professionals while at Accenture.</p> | <p><b>Chris Finlayson</b><br/>Non-Executive Director, Chairman of Lloyd's Register Group Ltd Remuneration Committee</p> <p>Chris is Chairman of Sicar Point Energy, a Director of Heigh LNG and a Non-Executive Director of Swire Pacific Offshore and TGS-NOPEC Geophysical Company ASA. Formerly, he was Chief Executive of BG Group, Chairman of Interoil Corp., and an Executive Vice President and Managing Director with Royal Dutch Shell. Chris is a geologist, physicist and petroleum engineer with nearly 40 years' technical and commercial experience in the oil and gas industry.</p> | <p><b>Michael F Lykiardopulo</b><br/>Senior Independent Director</p> <p>Michael was appointed Senior Independent Director on 26 May 2016. Michael is Managing Director of Lykiardopulo and Co. Ltd and is responsible for the commercial management of a fleet of oil tankers and bulk carriers. He is a qualified barrister.</p> <p>Michael was part of the Lloyd's Register Board which helped formulate the plans for the 2012 restructure and he served as a Trustee to help oversee the initial development of the Lloyd's Register Foundation. He is presently also Chairman of the Hellenic War Risks Association as well as serving as Vice Chairman of The Gard Insurance, Mutual and a Director of the UK Freight Demurrage and Defence Association.</p> | <p><b>Mark Kelsey</b><br/>Non-Executive Director</p> <p>Mark is the Chief Executive Officer for RELX Group PLC's Risk and Business Analytics division, responsible for Lexis Nexis Risk Solutions and Reed Business Information (RBI). Having begun his career with RBI in marketing, he went on to pioneer the launch of several online data services in the mid-1990s. Appointed as CEO in 2010, he was responsible for transferring RBI from a traditional magazine publisher to a leading provider of online and data services, turning around RBI's business and profitability. Mark holds a BA in Geography from Liverpool University and a MBA from Bradford University.</p> | <p><b>Isobel Macpherson</b><br/>Non-Executive Director, Chairman of Lloyd's Register Group Ltd Remuneration Committee</p> <p>Isobel spent over 20 years in corporate finance in the City of London with BZW, ABN AMRO, Hoare Govett and Dresdner Kleinwort Benson. In her last role she led the mid-market corporate finance, corporate broking, corporate banking support and investment teams at Dresdner Kleinwort Benson. Since leaving the City Isobel has become an independent Non-Executive Director having had roles with over 10 publicly listed companies as chairman, chairman of audit committees, remuneration committees and as Senior Independent Director. Currently, she is Senior Independent Director and Chairman of the Remuneration Committee at Decima Pharmatech plc and a Non-Executive Director of Workspace Group plc. Isobel is a Trustee of Lloyd's Register Foundation and a member of its Audit, Risk and Investment Committee.</p> |
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**Get in touch**

Please visit [www.lr.org](http://www.lr.org)  
for more information



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