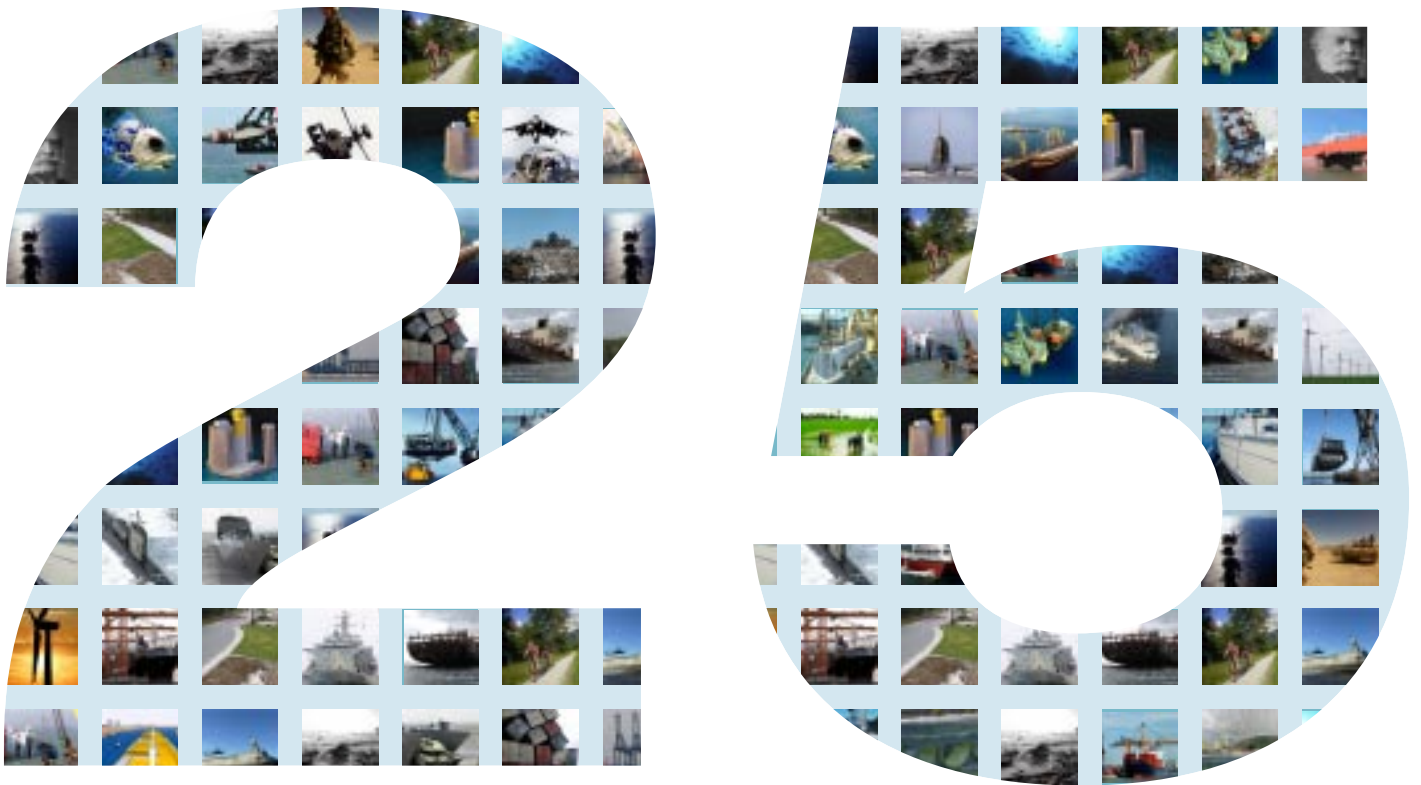


# FOCUS



# years of BMT



**Giving back gets underway in India**

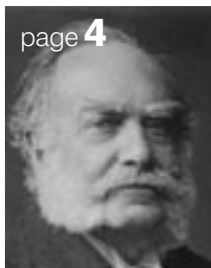


**Future Engineers  
Lego vs Meccano**



"Where will our knowledge take you?"

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## Where it all began

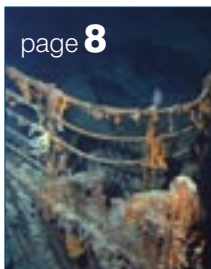
From its origins in The Salvage Association in 1856, we trace the maritime heritage which gives BMT its unique culture today



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## BMT Giveback

One of the highlights of our anniversary celebrations is the BMT Giveback project where our staff have demonstrated imagination, invention and insight to show how disasters can be overcome



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## The year 1985

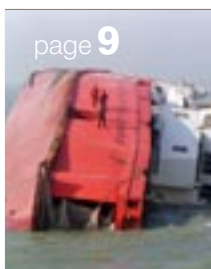
BMT starts here. Gorbachev came to power, the mobile phone emerged and the world of Windows was launched



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## Back to basics

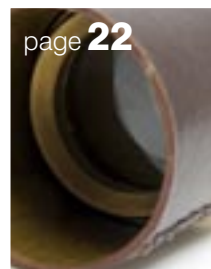
Professor Chris Hodge and his colleague, Olly Simmonds, argue that playing with Lego and Meccano is the seed for creating tomorrow's engineers



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## Experts in hydrodynamics

Two years after BMT was born the Herald of Free Enterprise capsized in one of Britain's worst maritime disasters of modern times. BMT helped to develop new safety regulations



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## 25 years at a glance

Journalist and maritime industry guru, Michael Grey, puts his telescope over the past 25 years of the shipping industry



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## The present

Our look at contemporary issues - how we combine energy security with green ambitions, how prevention is better than pay in marine insurance and the importance of trust in defence



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## Officially a great place to work

But we knew that! BMT Defence Services has just been declared a first class place to work



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## Future outlook

BMT Group Sector Directors look into the crystal ball of defence, energy and the environment, and transportation



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## It's all about our people

Being an Employee Benefit Trust means we've shared £14.5 million with staff



# EDITORIAL

“ Our commitment towards investing in research and development ensures that our specialist knowledge continues to demonstrate its value to our customers. ”



## Help us be green

This publication is now available online at [www.bmt.org/focus](http://www.bmt.org/focus), where you can also sign up to receive future editions.

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I would like to welcome you to a very special issue of Focus for 2010 in which we celebrate our 25th anniversary. In this issue, we take a nostalgic look back at 1985, the year in which BMT was formed from the merger of the British Ship Research Association (BSRA) and National Maritime Institute (NMI). I would like to share with you some of the experience, insight and knowledge that have shaped the BMT of today. But – as it is not in our nature to look back for long – we have also taken this opportunity to explore future challenges facing the industries we serve, through in-depth interviews with high profile industry leaders.

Recognising the importance of innovation is still to this day a fundamental part of our business. Notably, our roots can be traced back to the inventor of the steam turbine, Charles Parsons, whose pioneering spirit runs through our veins. Our commitment to investing in research and development ensures that our specialist knowledge continues to be of value to our customers. Couple this with the talent of our people and their drive and passion to be the best in our industry, it is no surprise that we are here celebrating 25 years of success. Our ability as an organisation to attract the very best people is second to none. Becoming an Employee Benefit Trust in 1998 has helped us to further demonstrate our commitment to the people who drive our knowledge-based business and instil a company culture of which we are all very proud.

I do hope you enjoy this issue and I would like to thank all of our contributing authors, with particular appreciation to our industry experts, who have kindly provided us with their views and insights. I look forward to hearing your thoughts on any of the subjects we have covered and if you wish to send us feedback, please do contact our editor.

A handwritten signature in blue ink that reads 'Peter French'.

**25** Years of insight and knowledge

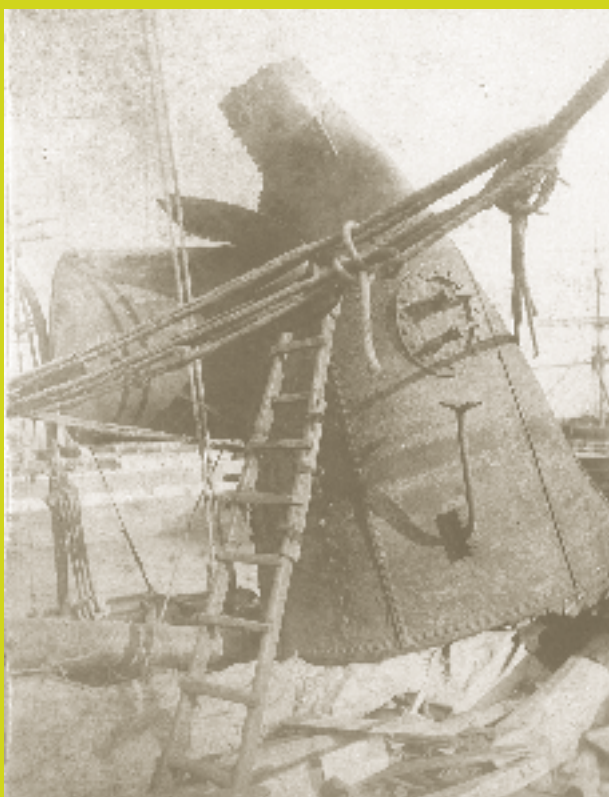
**Peter French**, Chief Executive



# WHERE IT ALL BEGAN

## The Salvage Association

In the early 1850s, there were many calls for an independent body to be set up that would bring information and advice to the maritime market and impose order on the chaotic nature of claims. Following a committee meeting in London, The Salvage Association was established as an independent organisation in 1856. It built up a sound reputation in the market and was granted the protection of a Royal Charter in 1867. With it came a coat of arms and Latin motto: *quaerite vera* – seek the truth, a statement which has inspired generations of surveyors.



**Above:** Early accident investigations from the late 19th and early 20th centuries.

# BMT

Although BMT was officially formed 25 years ago, its maritime genes stretch back much further through its connection with The Salvage Association which was started in 1856 and is now part of BMT Marine & Offshore Surveys. The intervening 154 years have given us and our customers the most comprehensive store of shipping casualty data anywhere in the world.

BMT's engineering innovation pedigree is unquestionable. The company founded by Charles Parsons, the inventor of the steam turbine, became a cornerstone of the British Ship Research Association, which in turn evolved into one half of BMT. Parsons' passion for innovation is still to this day a key part of BMT's ethos as well as a commitment to the research and development that makes it possible.

The other half of BMT came from a then nine year old National Maritime Institute (NMI), itself born out of the ship and aerodynamics divisions of the National Physical Laboratory (NPL). Notably the NPL played an integral role in driving the scheme for a national towing tank in the 1900s. This scheme was given significant impetus by the late Sir Alfred



**Above:** C.E.I. Seaplane awaiting trials off the Isle of Grain.

**Top right:** Twin screw model before testing in tank.

**Bottom right:** Miss Keary checking electrical power to rudder head torque apparatus.

# Our origins

Yarrow who, from the humblest of beginnings, managed to build a famous tradition in shipbuilding. As a result, the first national tank was built in 1910 in Teddington by the NPL. The hydrodynamic research in testing produced by this facility underpins BMT's activity today.

This rich heritage is a part of what makes BMT unique and reinforces its position as the source of high value insight and knowledge for those seeking engineering excellence. Like our early innovators, we're driven by a belief that things can always be better, safer, faster and more efficient. Research and development is what helps us turn that questioning spirit into pioneering, well informed and highly practical answers; and we will continue to invest to support our customers, anticipating changes within their industries and helping them to develop opportunities, enhance performance and minimise unwanted impact.



## Sir Alfred Yarrow

Sir Alfred Fernandez Yarrow, 1st Baronet was a British shipbuilder, born on 13th January 1842. He started a shipbuilding industry from humble origins in east London after serving an apprenticeship in Stepney and ventured into military vessels from the early 1870s building torpedo boats for the Argentine and Japanese navies. In 1892 he built the first two destroyers for the Royal Navy: Havock and Hornet of the Havock class.

## Sir Charles Algernon Parsons

Born on the 13th June 1854, Charles Algernon Parsons was an English Engineer, who was best known for his invention of the steam turbine. In 1897 Parsons designed and built Turbinia, a turbine-powered yacht which took the Royal Navy by storm at Queen Victoria's Diamond Jubilee Fleet Review off Portsmouth, with its then astonishing speed of 34 knots.



# IT HAPPENED IN 1985

# 1985



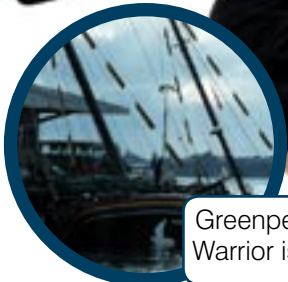
First UK mobile phone call



Microsoft launches the first edition of Windows



Gorbachev becomes Soviet Leader paving the way for Perestroika



Greenpeace's Rainbow Warrior is sunk



Hole in the Ozone layer discovered



The wreck of the Titanic is found

## BMT was born

1985 was the year BMT was created through the amalgamation of the National Maritime Institute and the British Ship Research Association. The Minister of State for Industry, Norman Lamont along with 200 other guests attended the launch which saw this distinctive organisation being born on April 1st.

It is the year the world celebrated 40 years of stability between the two nuclear superpowers of the time – the USA and Russia – and the beginning of BMT's extensive work in the defence sector, providing early design, project management and risk evaluation services to the UK Ministry of Defence.

In the area of aerodynamics, BMT was helping the McLaren racing team to develop the design of their successful line of racing cars. French driver, Alain Prost won the Formula One World Motor Racing Championship in a car design that was tested in BMT's wind tunnels. With then track speeds of over 200 mph, the need to perfect good aerodynamic stability was of prime importance.

Analysis of a different kind was being carried out at that time in BMT's test tanks. The world's largest mono-hull crane vessel at the time provided BMT with unusual challenges in modelling techniques and in tandem, BMT was working with Shell to investigate jacket transportation and procedures for their Eider project.

Since then, BMT has grown into a community of over 1,300 people, experts in all aspects of design, engineering, risk and safety. The answers to future challenges may not lie in our past, but we believe the independent mind, insight and knowledge that comes from our 25 years of expertise is an extremely powerful place to start. "

**25**  
Years of insight and knowledge

**1985**

BMT is formed and work begins on a major port project for the Hong Kong government

**1986**

McLaren carry out aerodynamic development work in BMT's race car wind tunnel

**1987**

BMT is involved in the investigation surrounding the capsizing of the Herald of Free Enterprise

# Experts in Hydrodynamics

**BMT's journey into ferry safety and major investigations of marine accidents began in 1987 with the Herald of Free Enterprise disaster. Here we discuss the investigation that followed and how BMT's crucial involvement, as industry experts in hydrodynamics, led to a major overhaul of existing, internationally recognised standards.**

Hailed as one of the worst maritime disasters involving a British registered ship in peacetime since the HMS Lolaire in 1919, it forced the industry to make revolutionary changes to regulations for the safety of ro-ro (roll-on/roll off) passenger ferries.

Moments after leaving the Belgian port of Zeebrugge on 6th March 1987, the Herald of Free Enterprise capsized, taking the lives of 193 passengers and crew. A full scale enquiry was immediately set up and within three days BMT was playing an integral role in the investigation, carrying out a multi-disciplinary study including model testing, computer simulation and a full scale trial aboard the sister ship, Pride of Free Enterprise. Commissioned by the Casualty Investigation Branch of the Department of Transport, BMT was asked to investigate the technical reasons for the capsizing, concentrating on the hydrodynamic aspects of how the water had been taken on board. Following these investigations, BMT submitted its findings as evidence to the formal Court of Inquiry into the disaster.

## BMT's diverse skills

BMT's diverse skills were used throughout this investigation which involved full scale ship tracking, environmental measurements, computer and physical modelling, extensive on-board measurements as well as the practical and important ability to assess the deadweight of a given ship. Model tests were carried out by BMT Fluid Mechanics who analysed the basic behaviour of a drifting and damaged ro-ro, and examined how long

it would take for the ferry to capsize in different wind and wave conditions. BMT Defence Services were tasked with examining various design modifications to make ro-ro ferries safer, such as retrofitting transverse barriers or movable bulkheads.

**“With more than 25 years of experience and knowledge, the company continues to be at the forefront of this sector offering a range of cutting edge services.”**

BMT's main finding was that the rapid capsizing began once sufficient water reached the car deck through the open bow doors of the ferry. It reported that a rapidly-heeling vessel would turn severely as a result of the asymmetric underwater hull shape, resisting any action by the rudder. Even when the ship was almost fully capsized, it probably still had some forward velocity to carry it to its final resting place, some 800 metres to starboard of its original track in the Zeebrugge channel.

## Major role

In the wake of this disaster, the UK's Department for Transport initiated a research programme and, as leading experts in hydrodynamics, BMT played

a major role. The findings helped shape the IMO's (International Maritime Organisation) SOLAS (Safety of Life at Sea) 90 regulations, applicable to all ro-ro passenger ships built since 1990. It brought about the prohibition of an open, undivided, deck of a certain length on a passenger ro-ro vessel similar to the Herald. SOLAS was originally created in response to the sinking of the Titanic and has been consistently updated and amended as technology evolves. Many other changes were enforced following the Zeebrugge disaster, most of them operational activities, but some doubt remained as to whether the SOLAS 90 requirements went far enough.

## At the forefront

This was the first of many high profile post-disaster investigations in which BMT was to take a lead role in employing advanced simulation tools. These have included the catastrophic explosion on the North Sea oil production platform Piper Alpha in 1988, the 1996 Sea Empress oil spill and most recently in 2007, the break-up of MSC Napoli.

BMT is still very focused on the shipping industry. With 25 years of experience and knowledge, it's no surprise that the company continues to be at the forefront of this market sector, offering a range of cutting edge services that covers all aspects of the ship life cycle.

# 1988

Following research, BMT plays an integral role in shaping new ferry safety regulations

# 1989

BMT increases its international defence capabilities with the acquisition of USA-based Designers & Planners



# THE PRESENT: Defence

## Trust will help bridge gap

Described by the UK Defence Secretary, Liam Fox as “entirely unaffordable”, the UK’s defence programme is under close scrutiny with a Strategic Defence and Security Review (SDSR) now taking place. Prior to the outcomes being announced next month, David Gould, former COO of the Ministry of Defence DE&S and now Executive Chairman of Selex Systems Integration UK and Vega Consulting, provides FOCUS with his views. Here he highlights what the Government needs to do, and the important role the private sector can play in order to move forward in a much more positive and efficient way.

There can be no doubt that the UK Coalition Government has come into power at a very difficult time with the emphasis on public spending cuts to help reduce the budget deficit. Nowhere is this more evident than in the defence sector where the Coalition has not only inherited a war in Afghanistan, but also a black hole in the procurement budget of approximately £37bn over 10 years for equipment and support. Predicting exactly what will happen following the SDSR is impossible, but I think that the defence industry will look a lot leaner, with the public sector shrinking back to where it was a decade ago. The private sector will have a much bigger role to play in providing the Government with a platform to drive efficiencies throughout the industry.

But what can this UK Government do differently to its predecessor? Working on the supply side, what often amazes me is the lack of coordination within Government. For example, whether it is the MoD, NHS, Police or the Home Office, they all share a need for a highly secure IT infrastructure system that ensures that the right information gets to the right person and prevents sensitive data getting into the wrong hands. The logical approach would be for Government to ask: “how do we do this seamlessly across all Government departments?” i.e. one system which is fit for purpose for all. The fact is they don’t, it is usually a separate question that comes from different people and yet a common solution



“ This will mean that the private sector will have a much bigger role to play in providing the Government with a platform to drive efficiencies throughout the defence industry. ”

could be provided. Encouragingly, the potential for this approach is not lost on some new Ministers and I hope they succeed in pushing this message across Government to help enhance operational efficiencies and most importantly, reduce costs.

### Critical Knowledge

Furthermore, it is certain that sovereignty (the things which must be procured within the UK) will feature in the current SDSR, which will undoubtedly lead to a further Defence Industrial Strategy (DIS) being developed. I would like to see

the whole area of sovereignty focusing on the preservation of long term critical knowledge and for Government to work closely with industry to determine the most effective way of maintaining such knowledge. Government can easily get bogged down in the transactional processes and procedures such as financial management and logistics – why not outsource these areas so that you can focus on the bigger picture, i.e. how to preserve knowledge? The problem is that there is still a significant lack of trust between Government departments and industry, with organisations such as the MoD afraid of ‘losing control’. This mindset needs to change sooner rather than later as there is a considerable amount of expertise available in the private sector which departments such as the MoD are not harnessing. It would be refreshing to see Government departments consolidate so that expertise can be shared across Government, the MoD and other areas – a radical approach but potentially a very effective one.

Encouragingly, mindsets in the MoD are changing with the Naval Design Partnership (NDP) being a perfect example. Established to preserve key capabilities and knowledge in the British maritime industry beyond the work created by the design of the 65,000-ton Queen Elizabeth Class aircraft carriers for the Royal Navy, the NDP demonstrates a much more collaborative way of working between the MoD and

**25**  
Years of insight  
and knowledge



**1990**

First BMT office in Asia Pacific is opened and BMT acquires Reliability Consultants

**1991**

Sealink Stena appoints BMT to provide technical support for its entire UK fleet of modern passenger ferries

**1992**

Vice-Chancellor of Southampton University joins the BMT Board

industry specialists including BMT, BAE Systems, Babcock and others. It is vital that we do not underestimate the integral role companies such as these play in helping to maintain long term critical knowledge. BMT has been successfully operating in the defence sector for the last 25 years, building up a repository of insight, best practice and knowledge into technical excellence – the MoD and other Government departments would be foolish to ignore such a valuable asset.

### Future Collaboration

I can certainly see more future collaboration of this kind happening within the defence sector, which will provide specialised SMEs with a platform to engage more fully with Government departments, supporting them in securing efficiencies and most importantly helping to preserve the country's long term critical knowledge. Another reason why I am quite upbeat about the current market for SMEs is that the Coalition has expressed its distaste for 20 year PFI's (Private Finance Initiatives) and PPPs (Public-Private Partnerships) – as they are always very positive to start with because of the high level of investment that is secured upfront, but as time goes by they become extremely inflexible. That's not to say that they will fall apart, but Government will be looking to modify such initiatives and partnerships in order for them to work more effectively and so organisations who can work on the client side to help in this process will stand in good stead.

The defence sector is set to go through some significant and difficult changes. Although positive steps are being taken in order to foster a culture of collaboration between Government and industry, more can be done. Government needs to be clear on their outcomes and allow the private sector to recommend the most effective methodology - at the end of the day they have the skills and knowledge to deliver those outcomes efficiently. Ultimately it all comes down to trust!

## HMCS Ojibwa re-homed by BMT

BMT Fleet Technology has been appointed for the evaluation, movement and mounting of the decommissioned submarine HMCS Ojibwa to the Elgin Military Museum in Port Burwell, Ontario. Coming from Dartmouth, Nova Scotia, the Oberon Class HMCS Ojibwa will become a museum and learning centre.

"This is an exciting opportunity for us to support the preservation of Canada's naval heritage," says Aaron Dinovitzer, President of BMT Fleet Technology. "It's a little different from our 'day job' which includes delivering support to the major project management offices in the Department of National Defence. But it's the perfect double celebration – BMT's 25th and the 100th anniversary of the Canadian Navy."

**For further information contact:**  
**Andy Wills, BMT Fleet Technology,**  
[awills@fleetech.com](mailto:awills@fleetech.com)

## BMT unveils new FLC design

BMT Nigel Gee and BMT Defence Services have unveiled a new design for a highly capable Fast Landing Craft (FLC). Contracted by Defence Equipment & Support (DE&S) the team developed a novel, tri-hull monohull platform using a parent hull-form created through a BMT research and development programme, which included model tests to optimise performance.

Ed Dudson, Technical Director at BMT Nigel Gee, says: "Similar in size to the existing LCU Mk10, and capable of operating with UK amphibious support vessels, our innovative design meets the demanding UK MoD requirement for an FLC with high transit speed and high payload capacity plus excellent on-beach stability."

**For further information contact:**  
**Ed Dudson, BMT Nigel Gee,**  
[edudson@ngal.co.uk](mailto:edudson@ngal.co.uk)

## BMT Syntek Technologies Secures \$9.9m US Defense Contract

BMT Syntek Technologies has secured a contract worth \$9.9m from the US Department of Defense. The project includes research and development of various alternative technologies for advanced power system management and analysis as part of the development of the Next Generation Integrated Power System (NGIPS).

NGIPS' prime objective, set by Naval Sea Systems Command (NAVSEA), the largest of the Navy's five system commands, is to produce affordable power solutions for naval platforms.

BMT Syntek Technologies will also perform system-level performance analyses of NGIPS architectures and their associated components as well as analysing the impact of the projected performance on ship mission equipment and operational quality.

**For further information contact:**  
**Roger Nicholas,**  
**BMT Syntek Technologies,**  
[rnicholas@bmtsyntek.com](mailto:rnicholas@bmtsyntek.com)

# 1993

SMART<sup>STRESS</sup> is launched and BMT secures contract to install the system on all eight British Steel bulk carriers

# 1994

BMT's Oil Spill Information System (OSIS) wins a Seatrade award and is judged 'most significant improvement to technology for the year'



# THE PRESENT: Energy and Environment

## Keeping the lights on

It is widely acknowledged that to reduce greenhouse gas emissions, we must embrace renewable energy. But what impact will that have and what are the biggest constraints? FOCUS talks to John Westwood, Chairman of international energy and marine business analysts Douglas-Westwood about the challenges.

### **FOCUS: What is the likely trend in oil prices over the next decade?**

John: As the global economy recovers, oil prices will resume their upwards trend. Two factors are driving this: the decline in existing oil reserves and increasing demand. According to the International Energy Agency, we are depleting world oil reserves in existing fields at about 6.7% per annum. To maintain reserves means finding and developing the equivalent of a new Saudi Arabia every three years.

The developing economies are also increasing their demand. In 2009 the average Chinese citizen used only one sixth of the oil used by Europeans – so what happens as the Chinese economy develops and 1.3 billion people start buying mopeds or cars? Our models suggest China will increase demand from its current nine million barrels per day (bpd) to 25 million by 2030. India and other developing economies are set to follow.

### **FOCUS: How is this likely to drive offshore exploration?**

John: International Oil Companies (IOCs) have virtually nowhere left to go to have any real chance of a major discovery other than offshore. But shallow water offshore areas such as the North Sea have also depleted dramatically, forcing explorers into deep water where major finds are still to be made. Over the next five years, we expect deepwater production to double in countries such as Brazil, West Africa and the Gulf of Mexico, but this will be expensive with capital expenditure totalling some \$140 billion.

Furthermore, as recent events in the Gulf of Mexico have shown, deepwater oil is not 'easy' – the technical challenges are formidable. After disasters, such as Piper Alpha, the industry has become safety obsessed with both hardware and procedures based on multiple layers of fail-safe systems. But it's essential to prepare for the rare occasion when things go dramatically wrong.

“ So what happens as the Chinese economy develops and 1.3 billion people start buying mopeds or cars? Our models suggest China will increase demand from its current nine million barrels per day (bpd) to 25 million by 2030. ”

### **FOCUS: What will be the impact of the development of renewable energy and especially marine renewable resources such as offshore wind, waves and tides?**

John: For many countries wind power is an obvious way ahead. In Western Europe and the UK, we're rapidly using up the best onshore sites forcing a move to offshore locations where wind is also effective. At first, the industry virtually ignored this, then discovered to its considerable cost, that onshore hardware does not work effectively offshore. These difficulties are being overcome with the market developing at a remarkable pace. Recent Douglas-Westwood research suggests that the number of offshore turbines to be installed across Europe in 2015 could be up to 600 and this figure could grow dramatically increasing to 2,300 in 2030. Other regions such as China and America are likely to follow. This will require significant industrial resources in order to manufacture, install and maintain these turbines and the associated infrastructure.

Wave and tidal power is very different. The resource is huge, and in the case of tides very predictable, but the challenges of finding technical solutions that can handle the environment and being able to scale them up are considerable. It will happen but we expect it to be many years before these sectors move from embryonic technologies to real commercial businesses.

**25**  
Years of insight  
and knowledge

**1995**

BMT wins \$40m support contract for the US National Oceanic Atmospheric Administration's fleet replacement and modernisation programme

**1996**

BMT part of winning bid for the design, build and in-service support for the Royal Navy's next generation nuclear-powered Trafalgar Batch 2 submarine



**FOCUS: What do you see as the biggest constraints on realising future energy needs from offshore conventional and renewable resources?**

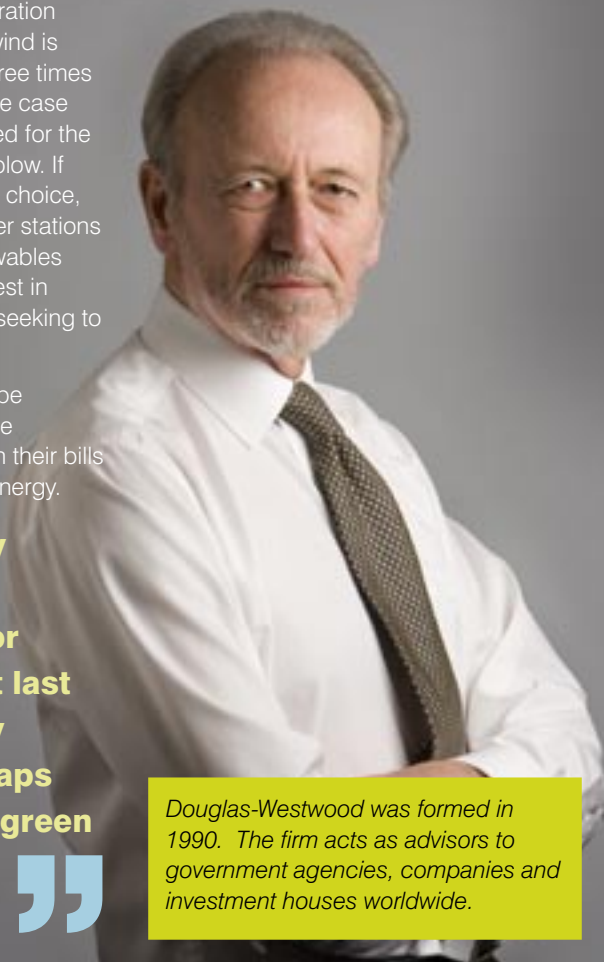
John: Oil is the fuel of transportation and for the foreseeable future there is no real alternative – but oil supplies are finite. Natural gas is cheap and abundant, and is likely to be the bridge between today’s oil-based economy and tomorrow’s green power. The growth of interest in renewable energy has been primarily driven by the desire to reduce greenhouse gas emissions by burning less fossil fuel, not by economics. I support renewable energy, but it’s important to realise the economic consequences. Taking combined cycle gas-fired generation capex as a baseline, onshore wind is twice the cost, offshore wind three times and nuclear five times and in the case of wind power, backup is needed for the times when the wind does not blow. If power companies were given a choice, they would build gas-fired power stations and not invest in offshore renewables but they are encouraged to invest in renewable by national policies seeking to alleviate global warming.

The real political challenge will be to persuade voters to accept the considerable future increases in their bills caused by the move to green energy.

**“...there is a ray of hope. The fundamental need for energy security is at last being recognised by politicians and perhaps this, combined with green politics, will provide a way ahead.”**

Also we need to enable access to the many small, widely dispersed, offshore oil ‘pools’ in areas such as the North Sea and the large reserves in very deep waters and the Arctic. In the case of offshore renewables, we need to halve the capex to make them economically viable. Major long-term investments in technology are needed, but to do that we need more technicians, engineers and scientists, especially within the UK.

But there is a ray of hope. The fundamental need for energy security is at last being recognised by politicians and perhaps this, combined with green politics, will provide a way ahead.



*Douglas-Westwood was formed in 1990. The firm acts as advisors to government agencies, companies and investment houses worldwide.*

**Robotic fish stars at London’s Science Museum**

Visitors to London’s Science Museum will have a rare opportunity to see the latest weapon in the fight against water pollution – a fully automated robotic fish developed by BMT and partners.

The robotic fish will soon be undergoing sea trials to test their ability in monitoring pollution. This three-year research project, named SHOAL, is being funded by the European Commission and is being developed to provide a new solution to detecting pollution.

For further information contact: Luke Speller, BMT Group, lspeller@bmtmail.com

**Saipem contract for BMT Scientific Marine Services**

BMT Scientific Marine Services has been selected by Saipem S.A. to provide a tension monitoring system for two single leg risers. The installation is located offshore West Africa in deep water associated with two Floating Production Storage and Offloading (FPSO) units.

BMT Scientific Marine Services brings valuable experience to this project having supplied a Free Standing Hybrid Riser Tower tension, motion and position monitoring system for Petrobras’s P-52 platform offshore Brazil, a Hybrid Riser Tower Monitoring System for BP’s Greater Plutonio Block 18 and a comprehensive integrity monitoring system for the Cascade Chinook Free Standing Hybrid Riser (FSHR) and Disconnectable Turret Buoy.

For further information contact: Mary Hind, BMT Scientific Marine Services, mhind@scimar.com

**BMT Office in Brazil**

BMT will soon be opening a new office in Brazil to support products and services being delivered to the offshore oil and gas market. Visit our new Portuguese language website at [www.scimar.com/Brazil](http://www.scimar.com/Brazil).

For further information contact: Mary Hind, BMT Scientific Marine Services, mhind@scimar.com

**1997**

BMT undertakes the maritime civil engineering of Hong Kong’s Central Reclamation project including the design of low reflection sea walls

**1998**

A defining moment for BMT as it is transformed into an Employee Benefit Trust (EBT)

**1999**

BMT increases its environmental capability through the acquisition of US-based Scientific Marine Services and Cordah in Scotland

# THE PRESENT: Transport

## Collaboration is key to reducing loss

In the maritime industry, loss prevention has always been an important risk mitigation tool for insurers. Recently, owners and operators of large shipping companies have started implementing their own programmes indicating a dramatic shift in the industry. FOCUS talks to insurance experts, Karl Lumbers and Simon Stonehouse, about the challenges of this cultural change.

**FOCUS: What are the key trends and current challenges for your industry and its stakeholders?**

**Karl:** We've moved away from the 'trust me, I'm a doctor' mentality. Ship owners are now much more accountable for their actions and the industry has to assess every possible risk – not only by the legal authorities but also by the people who charter our vessels. Loss prevention programmes play a key role in helping to reduce the number of claims and keep premiums down for the ship owners. One crucial factor in mutual insurance is that all ship owners share the risk, and the cost, so they don't want to subsidise an operator who decides to cut corners to save money. What the ship owner is looking for are industry standards within the protection and indemnity insurance (P&I) Club that everyone adheres to so they feel confident they are sharing

risks and their money with like-minded operators. This is certainly what drives loss prevention in the P&I world.

**Simon:** Marine claims is a big issue for hull and machinery (H&M) insurers. It's not uncommon for inflated claims to be presented, so that owners can carry out other work on their vessel. Underwriters need to get far more involved in the claims process to stamp this out. Hull underwriters are happy to pay credible claims, so a proactive and rigorous approach to marine claims is vital along with using quality surveyors, adjusters and repairers. Strong control can make the difference between a profit and a loss on a hull account – false claims need to be eradicated sooner rather than later.

Loss prevention differs for each sector of shipping, with tankers and LNG carriers notably the most effective at having loss

prevention programmes in place. The main challenge here is consistency, with many bad practitioners still out there looking to cut corners. Moving forward, I agree with Karl that accountability is key and feel a trend will evolve over the next few years of underwriters demanding evidence of loss prevention. In some cases, they may provide loss prevention tools to the owners to ensure that they do meet the required standards.

**FOCUS: Do you foresee a fundamentally different approach to loss prevention in five years time?**

**Simon:** H&M underwriters are commercial organisations here to make a profit and they will have to start making sure that the risks they are writing can produce the required return. For this to happen they will be looking more closely at ship owners to ensure that a loss prevention scheme has been implemented. One of the key issues within the shipping industry is the pace of change in technology which, by default, brings more regulations for ship owners to abide by. Much of this has gone over many underwriters' heads and they've not fully appreciated the complexities involved. We insure crew negligence – and the more kit that is introduced on board a vessel, the more chance there



**Karl Lumbers** is a Master Mariner, with over thirty five years experience in the marine industry. He joined Thomas Miller, managers of the UK P&I Club, in 1986. Prior to this he served at sea with P&O. He is presently a Director of Thomas Miller P&I Ltd and is responsible for the day to day running of the Club's Ship Inspection programme and the Club's Loss Prevention programme.

**25**  
Years of insight  
and knowledge

**2000**

BMT acquires a stake in Canadian-based Fleet Technology, whose expertise in ice and material engineering give the group important new capabilities

**2001**

BMT carries out projects for the European Space Agency and the British National Space Centre

**2002**

BMT acquires the business of The Salvage Association and begins work with the Swedish Army

is of things going wrong, especially if the crew have not been trained properly – all of which will no doubt increase claims. Gone will be the days when underwriters make instant decisions on whether to insure a fleet or not – brokers will be much more cautious moving forward.

**Karl:** I believe having a structured process in place to record and measure the causes of claims will help to identify trends and set benchmarks because at the moment these methodologies are only qualitative, i.e. based on people's opinions. The old saying 'you can't manage what you can't measure' has never been more valid. At present, the Club is working with several of its members providing in-depth risk profiling of their fleets and working with them, with the Club's ship inspectors, claims executives and underwriters to assess those threats and controls. Hopefully by focusing on the high-risk threats which cause P&I claims and understanding how the controls that we, as insurers, feel have failed to contain some of those threats, will mitigate the consequences. This will mean in future one small mistake by a human, either on board or ashore, is not 'the straw that breaks the camel's back'.

**FOCUS: Will the scope of ship surveys be broadened (e.g. to cover human factor metrics) as part of loss prevention?**

**Karl:** Absolutely. As I said, we're moving away from a prescriptive approach to one where we work very closely with the crew to ensure that human factor metrics are incorporated into future loss prevention. That's not to say prescriptive inspection won't have a role to play. Indeed, prior to admitting a ship to the Club, we will still need to know a ship has a basic standard, but once it is in the Club we will always try to help members reduce their claims which in turn will involve much more risk assessment taking place. What

is vital for companies such as BMT is that we advise ship owners on how to carry out simple risk assessment exercises – it's no good developing a 150 page report which nobody understands. Everyone must work together to develop a robust methodology benefitting the whole supply chain and ultimately reducing claims.

**Simon:** Ship surveys within H&M were broadened about two years ago, by the Joint Hull Committee of which I was Chair. This Committee brought out a suite of clauses which covered the ship engines, conditions of the vessel and office management – the latter survey was further modified about 18 months ago to include a whole section on crewing. The next stage is to get the underwriters to understand what the surveys are demonstrating. I suspect that in future underwriters will look for support from external consultants who have particular expertise in this area such as BMT.

**Simon Stonehouse** was appointed Hull Underwriter at Brit Insurance in 2004 having deputised on the account for the previous ten years. He has over 26 years experience in marine underwriting which has enabled him to gain a strong grounding in statistical research, analysis and risk management.



## BMT helps rehabilitate Port of Itajai with PC Rembrandt

BMT ARGOSS has deployed its marine manoeuvring simulator, PC Rembrandt, to assist the Port of Itajai in Brazil. The port, which was struck by a flood two years ago, had to reduce the size and draught of vessels that could enter due to severe silting. Following one of the largest surveying and dredging operations in Brazil, the port is once again open for business to large container vessels.



In order to refresh its pilot's ship handling knowledge and experience of large containerships, Itajai Port Authority commissioned Coastal Planning and Engineering of Brazil (CPE Brasil) and BMT ARGOSS to provide a PC Rembrandt marine simulator workshop. The workshop was attended by Itajai Pilots, senior representatives of APM Itajai, MSC and the Port Authority.

At the end of the training, a set of Standard Operation Procedures (SOPs) were developed between BMT ARGOSS and Port of Itajai's Pilots for the safe operation and manoeuvring of container vessels of 290m+.

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## 2003

BMT is praised by Secretary of State for Defence for its design of the Royal Navy Future Aircraft Carrier which is adopted by the UK MoD

## 2004

PC Rembrandt, BMT's ship manoeuvring simulator is used onboard the world's largest liner, Cunard's Queen Mary 2

# FUTURE OUTLOOK

## Defence: Looking to the Future

**The outlook from a defence perspective is always uncertain; more so now due to the rising political and economic strength of Asia and the continued financial challenges and constraints in the world. This will be sure to challenge us and stimulate a need for more innovation but in order to achieve mutual benefit we need to be clear about the market and our clients' needs.**

### Key Questions

The threats that nations face, including terrorism, are driven by global pressure for energy, food and water as well as related population migration and wealth differentials which currently exist between the East and West.

Foreign, environmental, energy and aid policies are all related and in turn, the objectives of such policies determine the defence and security capability needed to address and deliver these objectives: what we want to protect, on whom and how to exert influence and what is no longer necessary. To achieve this, clear and attainable National Government policies must form the starting point. However, many Governments across the

world have failed to accomplish this in the past, leading to a lack of coherence in defence strategy. As set out by David Gould on Page 8, both Government and industry must look at how things can be done differently – most importantly, more efficiently due to the budget constraints we must work within.

### Defence (and the rest of Government) must change

Defence is not a free market where the consumer has the opportunity to choose between suppliers. Government is the ultimate customer using taxpayers' money to buy what is required and so they demand value in return. Existing approaches have yet to deliver such value consistently and so changes must be made.

We must all accept that there is no such thing as the perfect solution. There must be greater willingness to stop under performing projects and programmes much earlier in the process.

### Acquisition and Design Solutions

Questions that must be answered by Government and industry are: can existing equipments and systems do the job and can it be done more efficiently, effectively and sensibly? All too often, the starting point is an immature requirement for which the difficult trade-offs between cost, performance and time have not been sufficiently analysed, often guaranteeing future scope change and in most cases, significant cost escalation. Would it not be better to accept an imperfect requirement? Certainly the 80:20 principle applies.

An open mind is needed in order to innovate and provide sound engineering solutions. Through an improved collaborative working approach we can ensure that we get the best out of all our defence resources, especially the SMEs, and the science, technology and academic communities. For necessity to be the mother of invention, challenges to performance, cost or time should be embraced to stimulate innovation. There will always be better ways of doing things – what did we do before Google, Microsoft and Apple?

### Science and technology wins wars

Although innovative engineering gives the battle winning edge, Government defence departments need to invest the limited resources available for research and development very wisely. In the age of the virtual prototype we must apply simulation and modelling methods to make a more refined selection of the R&D projects likely to deliver their objectives.

### Collaboration - "Trust but verify"

In order to collaborate successfully we need a partnership approach between Government and industry within which informed challenge and support for new ideas is normal behaviour. In the UK this "trust but verify" approach started on the Queen Elizabeth Class Carriers and is being applied on the latest submarine programmes. It will be refined in the Naval Design Partnership, which connects user and supplier communities through pragmatic and affordable designs. Similar collaborative approaches might yet be needed in the US, Australia and Canada in response to a tightening of the purse strings.



David Rainford, Sector Director - Defence, BMT Group Ltd

**25**  
Years of insight  
and knowledge



**2005**

The X-Craft, designed by BMT for the US Navy's Office of Naval Research, is launched

**2006**

BMT provides technical support to architects and structural engineers for Stonecutters Bridge

**2007**

BMT helps to safely salvage the remaining cargo from the MSC Napoli

# Rising to the Energy and Environment Challenge

Meeting future energy needs is just one of the many challenges posed by progressive industrialisation and a growing population. The Earth's population has grown from some 500 million in 1492 to over 6.8 billion today, with a projected growth to around 9 billion by 2050. This transition places ever growing pressure on the Earth's resources as well as on the local and global environment upon which we all ultimately depend.

Meeting and managing a growing population's demands for energy and water are the most pressing of these resource challenges as, without satisfying these needs, increased food production and further industrialisation are not possible. These two challenges are related; we know that the burning of fossil fuels is driving changes in rainfall patterns, leading to greater flood risk or more pronounced drought. In some parts of the world, where demand for water already exceeds supply, large quantities of conventional energy are already being used to produce fresh water via the desalination of seawater. Even in rainy Britain, water shortages have resulted in the UK's first large scale desalination plant in London; opened earlier this year, this facility is powered by recycled cooking oil and waste fat.

## Knowledge is key

Engineering, scientific and technical knowledge and innovation are essential for meeting the complex challenges associated with delivering future resource needs. Our greatest challenge this century is to deliver sufficient energy and water on a sustainable basis, with minimum short and long-term impact on the environment.

As John Westwood states in his interview on page 10, a key component of the energy challenge is speeding up the transition of renewable technologies from concept to commercial scale to drive down cost and improve reliability.



Ralph Rayner, Sector Director – Energy and Environment, BMT Group Ltd

For marine renewables, where the harsh environment poses significant design and construction challenges, and where sea conditions constrain maintenance operations, this is especially the case. As John also points out, to satisfy energy needs in the immediate term we will need to drive conventional fossil fuel exploration and production into ever deeper and more hostile waters which will demand the input of specialist engineers, scientists and technologists.

## Innovation and skills

Managing water resources, especially in densely populated coastal regions, is equally demanding. Many different skills are required to deliver infrastructure which meets freshwater needs at the same time

“ Our greatest challenge this century is to deliver sufficient energy and water on a sustainable basis, with minimum short and long-term impact on the environment. ”

as defending populations against flooding and protecting the natural environment. Here again success is dependent on innovation and skills to build the knowledge needed for cost effective, safe and environmentally sound design, construction and operation.

## Global endeavour

Many public and private organisations contribute to supplying the knowledge required to create solutions to our resource challenges. BMT is playing its part in this global endeavour; our engineers, scientists and technologists are working with advanced facilities, such as wind tunnels, a world leading capability in computational fluid dynamics, specialist software tools, measurement systems, models and machines, to rise to the resource and environmental protection challenges of the future.

# 2008

BMT develops a ground-breaking oil spill ocean surveillance service and wins its first contract with the European Defence Agency

# 2009

Our R&D team develops robotic fish to monitor and trace port pollution



# FUTURE OUTLOOK

## TRANSPORT: Factoring in the human element

**It is clear to see that the dynamics within the marine insurance industry are changing with a more proactive approach taking shape by all stakeholders. Increased accountability, risk profiling and an evidence-based approach to loss prevention are becoming the norm in order to tackle some of the challenges that lie ahead, but we must not forget to factor in the human element. Human Factors Engineering (HFE) has an extremely important role to play in future ship designs in order to minimise errors at source or indeed to help mitigate the consequences of an error.**

This is particularly relevant when you consider the exponential increase in container ship size and capacity. Some container industry players are considering 16,000 TEU ships, and shipyards within South Korea have drawn up plans for 22,000 TEU giants. Intense debate can be expected within insurance sectors in regards to managing risks associated with these leviathans.

It is highly likely that there will be greater scrutiny on the assessment of human factors for radical new designs and the associated operational regimes.

Both Karl Lumbers and Simon Stonehouse, our insurance experts, certainly advocated this in their interview on page 12.

Within the P&I world, in excess of 60% of claims result from human error, indicating that there is still insufficient human factor metrics being built into loss prevention schemes. It is imperative we as an industry address this now.

This may involve further developments of the International Ship Management (ISM) code, an international standard for the safe management and operation of ships and for pollution prevention.

Minor amendments, implemented this year, clearly highlight a requirement for an operational risk assessment and the implementation of corrective actions following any accidents. Such amendments are likely to signify an increased emphasis on the human factor element.

As the industry becomes more accountable, the need for more targeted ship inspections and condition survey programme implementation is heightened. This will help to determine the root causes of accidents and failures, specifically on the behaviour, processes and procedures that provide a high degree of coupling between high risk threats. A much wider adoption of reliability centred maintenance (RCM) and condition-based monitoring (CBM) tools to facilitate optimised maintenance scheduling and to minimise unnecessary human intervention is also key moving forward.

Furthermore, the potential to develop a more rigorous interrogation of accident statistics and the application of recognised risk management models such as the bow-tie model is enormous.

Developing risk profiling in Hull & Machinery and enhanced condition survey

programmes is already an integral part of BMT's capabilities.

The specialist HFE team within BMT has developed a two-pronged approach to supporting marine insurers in managing risks. First, by analysing the accident statistics, the data can be used to reveal critical HFE aspects. Assessing the opportunity for error associated with these will identify hazards, tasks that may be prone to error or designs that do not meet HFE design standards or best practice.

Following data analysis, a shipboard survey is recommended as a heuristic evaluation of the vessel. Analysis will address not only those issues that are salient and have recorded mishaps (reactive), but draw upon HF standards to address potential mishaps before they happen (proactive). Following this, formulating solutions based on the identified risks and their categorization will reduce key threats.

Given the proven experience and knowledge of BMT, the HFE team is poised to offer the required mitigations to these costly design deficiencies and therefore, be a significant force in reversing the trends in human error in the commercial maritime industry.



*Dr Phil Thompson, Sector Director – Transport, BMT Group Ltd*

Since the EBT's creation

**£14.5 million**

has been paid out to staff

# It's all about our people

Born out of two former government departments when it was privatised in 1985, BMT operated as a Scientific Research Association (SRA) for more than a decade. In 1998, under the guidance of its then Chairman and CEO, David Goodrich, it was reborn as an Employee Benefit Trust (EBT). This was to secure independence, allow long-term thinking and make a commitment to the people who drive the knowledge-based business. David McSweeney, Finance Director talks to FOCUS about the advance of the EBT.

**Focus: Why did the business decide to transform into an EBT?**

David: During the first 10 years of BMT the business grew quickly and the emphasis was increasingly on securing commercially funded research and consultancy work. The Board became more and more concerned that there were aspects of the constitution which hindered the continuing development and long-term stability of the business. For example, there was no clear structure of ownership and control which was creating uncertainty amongst clients, particularly in overseas markets. Furthermore, the then membership structure raised the possibility of a conflict of interest. So to clarify ownership and provide better focus, proposals were put forward by the Board to become an EBT.

**Focus: What challenges did this create?**

David: Convincing the members to relinquish ownership of the business was certainly a challenge. Even though they could never benefit financially from the company, there was still a slight fear that they could have grouped together in order to overturn the decision. This of course didn't happen as they could clearly see that this was the most effective way for the business to move forward. There was certainly a cultural challenge to overcome too. We had to convince many former civil servants that this commercial path we wanted to take was indeed the right one not only for us, but also for our customers. Furthermore, it was vital that once the

decision was made, we had to move quickly to ensure that our people were not being distracted by the changes being put in place.

**Focus: What are the basic principles of the EBT?**

David: It is very similar to the John Lewis Partnership model in the UK whereby a group wide profit-sharing scheme exists, under which all employees worldwide, after an initial qualifying period, will share in an annual distribution of profit. Each employee's share is based on a combination of length of service and salary. What makes our EBT a strong governance model is the structure of the Trustees, three of whom are non-executive Directors and one of whom is an independent Trustee, which helps to preserve a strong degree of balance.

**Focus: Can you describe the advantages to both business and employees?**

Of course there is the financial incentive for employees, which in fact is also a benefit to the business, as it has fostered a culture of employee loyalty. We strongly believe that becoming an EBT is evidence of BMT being a people business which has a high level of honesty and integrity. Our independence from shareholders and the commitment of our people means we can continue to push our business forward providing the valuable insight and knowledge our customers require.



David McSweeney

**“ We strongly believe that becoming an EBT is evidence of BMT being a people business which has a high level of honesty and integrity. ”**

# BMT GIVEBACK PROJECT

## BMT Giveback: a celebration

In April 2010, BMT celebrated its 25th anniversary and despite challenging economic times, enjoyed an excellent year with record turnover and profits. But how to celebrate? We needed more than an anniversary pen or mug. We wanted to do something special...

Our desire was to use the skills, knowledge and expertise that BMT's 1,300 employees have built up over the years to address a problem that impacted negatively on people's lives. As an independent group with sound financial security and a strong track record in delivering world class projects, we felt confident that our people would rise to the challenge.

And so BMT Giveback was born; an initiative inviting ideas that could potentially bring positive solutions to problems such as flooding, drought, housing, sanitation, energy supply and food production - to name just a few.

We asked that the ideas should clearly reflect the values and interests of BMT and its people; projects that built upon our reputation for insight and knowledge. They should use BMT expertise for maximum impact and be deliverable in a 12-month timeframe.

Ultimately it was about conceptualising, designing and delivering a solution that would drive a genuine social benefit.

### Project Feedback

**Neil Millwood** of BMT Fleet Technology presented an idea for developing disaster kits using corrugated galvanized iron sheets. The sheets could be used as building material for items such as shelter, water tanks and roof structures.

*"I think that we at BMT will learn just as much as the villagers in India – indeed, we will learn how resilient and resourceful people can be when life's circumstances dictate."*

**John Vazey**, BMT WBM provided many ideas, one of which was a light weight backhoe for rescue and reconstruction work.

*"I learnt that there were some really generous, motivated, clever people in our organisation."*

### Big Ideas

And we weren't disappointed. When the competition closed in July, we'd received over 100 entries for projects ranging from sustainable power barges and disaster relief ships to rainwater traps and rice planting machines. Each and every one of them legitimate and well thought out; concepts that demonstrated the ingenuity of BMT people around the world.

The submissions were shortlisted by the members of BMT's Executive Management Board. From 107 entries, five were selected for feasibility testing.

**Increasing Ferry Safety in the Developing World** – a study of the causes of ferry disasters, followed by a review of vessel design with regards to age, suitability and regulatory compliance.

**Filterless River Water Purification** – the design and construction of a solar furnace to deliver thermal energy to boil river water.

**Low Cost Drainage and Sewage Treatment** – a low-cost, innovative, scalable, drainage and sewage treatment system to reduce the risk of water borne disease.

**Wide Area Rainwater Trap** – a kit which provides a plastic sheet funnel for rainwater harvesting into a well or other receptacle.

**Cheap Boats to Replace Those Lost to Disaster** – an idea for making easy to assemble cheap boats from flatpacked kits.

### Staff Vote

To select a winner from these five very strong candidates, an online voting page was launched to all employees throughout the group and they were invited to pick their favourite.

With over 37% of the votes, the winner was the 'Low Cost Drainage and Sewage Treatment' idea sent in by the staff of BMT Consultants India, based in Ahmedabad, Mumbai and Chennai.

A fantastic concept that will, initially, benefit the community of a small village in India but, it is hoped in time, will be replicated across many other villages throughout the country.

### The Future

To progress the idea, a project team is being assembled from experts in several BMT companies. They will develop the design for the sewerage system and plan its implementation, to start early in 2011 with the entire project completed within a year.

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# Creative, cost effective and clever

A lack of water and proper sanitation is one of the largest problems facing us today. Over 1 billion of the world's population have no access to safe taps or wells and over 1.2 billion have no toilets or a sewerage system. The winner of the BMT Giveback project, 'Low Cost Drainage and Sewage Treatment', aims to find a way to help address these problems.



In the Indian province of Gujarat is a village called Khintla, with a population of around 2,500. It is the epitome of the problem. A poor village by any standards, the community had a water supply problem. In partnership with the Water and Sanitation Management Organization (WASMO) and the Aga Khan Rural Support Programme (AKRSP), the villagers established a low cost system in 2009. This pumped water from a bore well into a series of storage tanks, each serving 20-25 households. The community owns, operates and maintains the facility and takes great pride in cleaning and managing the tanks.

## One solution, new problem

Although this system has made a huge difference to their lives, it created a new problem for the villagers. No sewerage or sewage treatment facility exists so each

household gets rid of waste water through an outlet from either their kitchen or wash area directly into the street, making them open drains. The resulting pollution contributes to water borne diseases such as dysentery, typhoid, diarrhoea and jaundice, which kill huge numbers of children in the country every year.

## Enter the BMT Giveback team

The BMT Giveback project will provide the resources for the design and implementation of a low-cost, scalable sewerage and sewage treatment system.

A team of BMT experts will visit the village and develop a concept design based on the challenges associated with its landscape. Then they will create an inexpensive system that treats and disinfects the sewage.

The AKRSP will provide labour and project management assistance with the community providing local knowledge and establishing a common fund to maintain the system.

## Small beginnings, big hopes

When the project is finished, BMT will donate the IP rights of the design to the AKRSP who will seek to replicate the design and specification in other villages throughout India.

If successful, it is anticipated that many more villages throughout India could benefit from the pilot in Khintla.

## The village

Khintla is a small village of 400 households; it has two primary schools and a secondary school which house around 570 children. The literacy rate of villagers is approximately 60%.

They don't have their own primary health centre or market but use a nearby village located 20 kms away. The community has shown team work and is headed by a pro-active 'Sarpanch' (headman). The village also has a strong woman's association which drives health related issues.



## BMT INTERVIEW

# Back to basics

Professor Chris Hodge, Chief Electrical Engineer at BMT Defence Services Ltd, believes that early engagement in technology through play is vital to forming future engineers. His colleague and newly qualified engineer, Olly Simmonds would agree, having been told once that there are two types of engineer: those who grew up with Lego and those who grew up with Meccano. The suggestion is that an interest in engineering can be developed from an early age and toys like Lego and Meccano could help children develop an aptitude for the subject. Living in a world that is dominated by computer games and children's TV, is it any wonder that the engineering industry finds it difficult to promote the exciting opportunities available and attract much needed talent? Chris and Olly provide their insights into this issue highlighting what needs to be done to bridge the skills gap.



**Focus: Lego vs Meccano? What's the difference?**

Olly: I have seen research suggesting that children who played with Lego were much more creative, quickly building up concept ideas as they went and then being able to take it apart. Meccano, however, required more thinking; a Mecanno structure had to be planned in detail first, but once built was arguably more structurally sound.

I believe that any engineering project, small or large, requires both 'Lego' engineers and 'Mecanno' engineers for it to succeed.

**FOCUS: What opportunities were available to you when you began your career in engineering?**

Chris: The main opportunities available back in the late 1960s and early 70s for aspiring marine engineers were through the UK's Merchant Navy through company training schemes but I was finally attracted to the Royal Navy and the quality of the training available from the Engineering College. Certainly the big difference between then and now is the loss of our merchant fleet and the consequential reduction of the indigenous UK training schemes.

**FOCUS: Why do you think there is a lack of talent entering the industry now?**

Chris: Times have changed. Who maintains his or her own car these days; who builds their own radio sets, or pursues an engineering hobby that can involve their children? Technology nowadays arrives via computer games but such games will not inspire technological understanding and creativity and I think this is having a profound effect on our ability to attract new talent to the industry.

**FOCUS: What can be done to attract more talent?**

Chris: We need the Government to champion the inclusion of technology resources into the initial stages of education. Many of the programmes we have in place are targeting students in the secondary stage of education and, therefore, those already interested in science and technology. This reinforces the interest of those already attracted to engineering but does not create many new aspirants. To do that, we have to move down the educational ladder to the infant and primary levels and ensure we reach all school children.

**FOCUS: What sort of new opportunities can up-and-coming engineers take advantage of?**

Olly: There are opportunities out there, it is just a matter of reaching out and grabbing them. I took advantage of the Royal Academy of Engineering's (RAE's) 'Engineering Education Scheme' while I was at school and this quickly reinforced my decision to pursue a career in this field. The RAE also offers a 'headstart' scheme which sends you to a university for up to 4 weeks of experience. This includes going to lectures and living on campus in the summer months to get a better feeling for what it would be like to study engineering.

**FOCUS: What advice would you give someone who was considering going to university and pursuing a career in engineering?**

Chris: Make sure you understand the difference between science and engineering and choose which is right for you. It is important to understand that they are different. Doing a physics degree or chemistry degree is completely different to doing an engineering degree. Engineering is about making a difference practically for the real world.

Olly: I would add that you must try and get as much work experience as possible as this will prove to be invaluable. It is an excellent way to find out if you are in fact following your right vocation. Whether it is a couple of weeks or months, the more experience you gain, the more certain you will be that engineering is right for you.

**FOCUS: Are there any other important points the industry needs to take note of?**

Chris: There are a limited number of placements available on engineering training schemes and these are very much in demand. As a result they tend to be promoted by word of mouth rather than via traditional advertising methods. This makes it difficult for potential engineers to identify and secure an appropriate training placement and can effectively put them off at the first hurdle. With such a huge demand for engineers across the board surely it makes sense to broaden both the availability and accessibility of these invaluable courses.

I also believe that the industry can do more to help nurture future engineers by offering work placements, graduate schemes and the like. BMT has strong links with local universities and schools, helping to highlight to students the many avenues of opportunity that are available. We also develop our employees by encouraging them to consider further education and continued professional development. If I could make a plea to the industry, it would be to engage with young people whenever possible, before they make lifelong decisions about their future careers. Perhaps by capturing the imagination of youngsters at an early age, they will realise that engineering is a truly worthwhile vocation to pursue.



Professor Chris Hodge and Olly Simmonds



## BMT INTERVIEW

# 25 Years of the Maritime Industry at a Glance

**Over the last 25 years, areas of the shipping industry have evolved so as to be unrecognisable, while the transformation in technology has brought about new and innovative ways of working. In this exclusive interview, Michael Grey talks to FOCUS about unprecedented changes the maritime industry has gone through during the lifetime of BMT.**

Many people who have been in the industry as long as I have will remember a time when the United Kingdom still had a substantial Red Ensign fleet dominating the world's shipping lanes. I can also remember when shipbuilding was an extremely active industry within Europe. The landscape looks different now. In the intervening years we have seen not only the significant loss of the great British fleet, but the almost complete disappearance of the European and American shipbuilding infrastructure, moved irreversibly to the East where Japan, South Korea and most recently China, are now dominant.

### Evolution and sophistication

The physical design and build of a ship has also evolved, becoming infinitely more specialised and complex than it was even in the 1960s. 50 years ago there were arguably three types of basic ships which were relatively simple to operate: tankers; dry cargo and passenger ships. Nowadays, every type of cargo requires its own specialist ship and separate sectors have emerged, such as gas, chemicals, or containers whereas in the past a general cargo ship would, and could, carry everything.

The sophistication of the technology now being used should be applauded but it can have its downside. Certainly, ships are more efficiently run because of the technology now available, but

there is a new challenge in finding the right people with the right skill-sets to manage and operate such specialised vessels. In the past a large proportion of the seafaring community possessed the skills necessary to work onboard any type of ship. Technology has dictated that considerable time and effort must now be invested to provide specialist training to ensure confidence in operating such sophisticated and, in some cases, complicated equipment.

### Joined up approach

As an industry we have tended to overlook what impact such technology will have on the operators. But mindsets are changing. Being part of the Human Element Advisory Group which was set up back in 2006 by the Maritime and Coastguard Agency (MCA), I am encouraged to see that a much more joined up approach to new technologies and earlier involvement from operators within the decision making process is beginning to change the relationship between the ship and those who will sail on it.

For example, on the bridge of modern ships it was common to have an integrated navigation system designed to manage every possible task including the steering and controlling of the vessel. This meant "demotion" of the Officer of the Watch to somebody who merely sits and waits for something to go wrong, rather than being intimately involved in



**Stay focused on the human element. The future challenge is to keep introducing new technologies whilst ensuring that the people are progressing at the same speed and not being excluded from the decision making process.**



the navigation of the ship. Fortunately, new navigation systems embrace the navigator much more – and we must never neglect the human element in favour of fancy equipment and clever computers. We talk about up to 90% of accidents being caused by humans but I believe that all accidents are caused by humans because, even when it is equipment failure, a human being has designed that equipment.

### Step change

The International Maritime Organization (IMO) is also helping to push the industry in the right direction and make that all important step change. In the past the sector has been very good at producing regulations centred upon structure or materials for example, but not at considering the people who would potentially operate that vessel and the impact of the new regulations on them. The human element is now firmly part of the regulatory process.

Since its formation, BMT has been at the forefront of shaping the industry of today through its high value insight and knowledge in engineering excellence. One important change that has taken place is the complete disappearance of the technical departments from the

average shipping company. Because of the slump suffered by the industry during the 1970s and 1980s, many of the large liner and tanker companies closed their technical divisions and so, increasingly, relied more on the technical expertise and knowledge of organisations such as BMT. Once upon a time a large liner or tanker company would have had a significant technical division which probably designed its own ships or at least oversaw the building of them – certainly they would have had a great deal to do with the lifetime operation of those ships.

### BMT rises to the challenge

BMT responded astonishingly well to the challenge and still continues to do so. I can't see shipping companies rebuilding their technical departments when expert organisations such as BMT now exist with a repository of technical expertise which they are now able to draw upon. I wouldn't mind betting that BMT has experts to cover any type of shipping operation whether it is for the offshore industry or ships operating within the high Arctic.

The research and development BMT commits to is also worth noting and it has played an integral role in proactively leading the industry into new areas



### About Michael Grey

Michael Grey has been associated with the shipping industry for the whole of his working life. At sea for 12 years with the Port Line of London and holder of a British Foreign Going Master's Certificate, he worked in the safety and technical department of the UK Chamber of Shipping before becoming a journalist. He has been Editor of Fairplay International Shipping Weekly and Lloyd's List and continues to contribute to maritime publications around the world.

of technology. When times are hard financially, there will always be an intense interest in innovation and BMT always seems to be at the forefront.

### Sustainably ahead

In particular, I know that there is now a considerable amount of sustainability work being carried out in the industry. BMT was working on sustainability before the word had scarcely been recognised, so when the industry suddenly woke up to the fact that they had to become more sustainable, BMT was already a few steps ahead.

Looking ahead to the next 25 years, if I was to give BMT one piece of advice, it would be to stay focused on the human element. At the moment, ship technology is moving way ahead of the people that operate it. The future challenge is to keep introducing new technologies whilst ensuring that the people are progressing at the same speed and not being excluded from the decision making process.



# MOVERS

Three new Managing Directors and one new President have joined BMT this year. They are:



Charles Behrle joins as President of BMT Designers & Planners based in Arlington, Virginia. Charles has spent several years working on the DDX Program for the US Navy and was the NAVSEA Warfare Center Division Commander from 2003-2006 before leaving to work for two private companies in the US defence industry.



BMT Marine & Offshore Surveys has appointed Nigel Clarke as Managing Director. Based in the London office, Nigel has been with the company since September 2009 having joined as

Finance Director. He has a strong background in the marine and offshore sectors having held senior positions within a number of oil and gas companies and within London Marine Group (LMG) where he was both Group Finance Director and acting CEO. Whilst with LMG, Nigel helped the Company achieve significant growth.



David Bright, Director of Operations at Bath based BMT Sigma since 2001, has been named as the new Managing Director of BMT Hi-Q Sigma. He was instrumental in the formation

of BMT Hi-Q Sigma in October 2009. During his time in the BMT group David has played a key role in driving business improvement programmes. These have delivered improvements to business alignment and information management leading to enhanced decision making.



Previously a Projects and Programmes Director for BMT Isis, Mike Prince has taken on the role of Managing Director as of 1st October this year. Mike started his career at British

Energy as a Nuclear Safety Case Officer and then spent a number of years at Atkins Aviation & Defence where he worked as Head of Safety and Supportability. He joined BMT in 2006 and has Board level responsibility for project and programme risk management, commercial issues, business management systems and business development in the Power and Energy market sectors.

# Officially a Great Place to Work

Bath based BMT Defence Services Ltd has been awarded First-Class status in the Best Companies survey of employees, marking it as a leading company in the country, and a place where people enjoy working. With offices in Bath and Weymouth, the company provides highly specialised design and engineering consultancy for clients such as the Ministry of Defence.

Managing Director Muir Macdonald said, "I wanted to see what our people like and dislike about working for BMT and to benchmark ourselves against some of the best in the nation. It's great to learn that we rank alongside names such as Microsoft, KPMG, and Kellogg UK as well as getting an impartial view of where we can improve".

"BMT's proven track record in delivering innovative and robust design solutions has ensured our continued involvement in priority projects."

**For further information contact: Johanna Probert, BMT Defence Services, [jprobert@bmtdsl.co.uk](mailto:jprobert@bmtdsl.co.uk)**

*Pictured (from left to right) are BMT Defence Services employees – Nick Tighe, Diane Shearn, Muir Macdonald, Helen Stevenson, Jacob Mann and Phil Green*

