

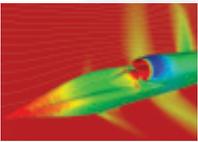
FOCUS

Safer, faster, more efficient

Happy landings



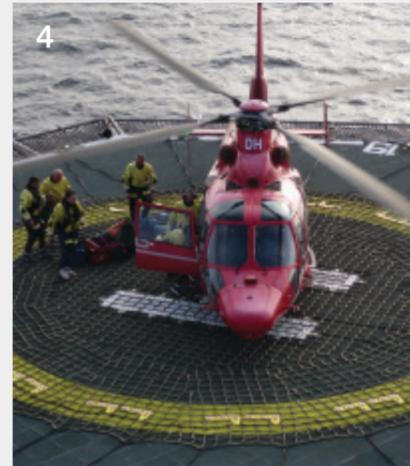
Scenting victory



Shipping's next super-highway



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FOCUS is published by:

BMT Group Ltd, Goodrich House,
1 Waldegrave Road,
Teddington, Middlesex, TW11 8LZ, UK

T: +44 (0)20 8943 5544
E: enquiries@bmtmail.com
W: www.bmt.org

Edited by Jenni Williamson
(jwilliamson@bmtmail.com)

Written by Emmett & Churchman
(www.ec-pr.com)

Designed by McCarron Associates
(www.mccarronassociates.com)

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Editorial

A warm welcome to the latest issue of Focus. 2016 has been an historic year with huge political change – the impact of which has yet to be felt. We enter 2017 with cautious optimism as a number of our markets continue to push through challenging times. Our strong belief that things can always be made safer, faster or more efficient provides us with a perfect platform from which to showcase our innovation and engineering excellence and support our customers in their efforts to deliver best-in-class solutions.



Peter French
Chief Executive

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In this issue

We look at the Bloodhound SSC project, an educational outreach programme like no other and Chief Aerodynamicist, Ron Ayers MBE takes us on a nostalgic trip down memory lane reinforcing the role CFD has played. While many oil companies are now looking at "walk-to-work" alternatives for platform transfers to reduce exposure to risk, HCA's Alex Knight believes that helicopters will remain essential to offshore operations. The Nicaragua Canal could be a serious game changer for the shipping industry – with exclusive access to HKND's Executive Vice President, Pang Kwok Wai, we talk to him about the technical considerations for such an ambitious scheme.

I hope you enjoy this issue and we would like to thank all our authors who have given their time to provide us with their views and insights. We always welcome your feedback on the magazine. If you have any thoughts on any of the subjects we have covered or would prefer to receive this publication in electronic format, please send your feedback to our editor at jwilliamson@bmtmail.com.

Help us be green. This publication is now available online at www.bmt.org/focus, where you can also sign up to receive future editions by e-mail.

Happy landings

Helicopter safety on the new frontiers of the offshore industry

Maintaining existing assets and delivering operational efficiencies through a more thorough understanding of the limiting environment around the platform will help the offshore industry meet the challenges of getting people to and from work safely.



Alex Knight
Managing Director

Alex Knight is Managing Director of the Helideck Certification Agency (HCA). Search and rescue trained by the Royal Navy in the 1970s, Alex is a respected thought leader in the industry.

The HCA is responsible for inspecting and certifying all helicopter landing areas on offshore vessels and installations in UK waters. It also provides services to major oil companies, platform constructors, helicopter operators, and national civilian aviation authorities worldwide.



There is no one-size-fits-all for safe helicopter operations. Different environments are hostile in different ways and safety will depend on a host of factors, from the physical helipad itself to the abilities of the crew operating it.

Try setting up a North Sea-style helideck fire system in the frozen far north of Canada and you will get a giant ice lolly when you need a long jet of water. Insisting helicopter passengers wear immersion suits and thermal liners for protection in the event of a ditch might make good sense in temperate climes, but is the last thing you need offshore in the United Arab Emirates or Malaysia.

While many oil companies are now looking at "walk-to-work" alternatives for platform transfers to reduce exposure to risk – a boat out to the field and a gangway on to the rig - helicopters will remain essential to offshore operations. Not only is air transfer faster and largely unaffected by the sea state, it is also the best way to get people to safety quickly in an emergency. Helicopters are the first lifeboats of the industry.

Technology is a great enabler for safer helicopter operations – as long as the introduction of complex systems is properly supported by training. There will always be a sophisticated balance between relying on technology and applying experience and gut feeling to fully understand the big picture.

Computer driven technology generates vast amounts of data which is invaluable for safety, but we have to learn to interpret it properly and in a way that drives improvements.

HUMS: the helicopter 'black box'

We need time to understand what the technology we introduce is telling us. Take HUMS, the helicopter equivalent of the black box in a fixed wing aircraft. You apply certain parameters and when a system on the aircraft bumps up against one, a warning light comes on in the cockpit. Engineers later examine the HUMS data and may, quite safely, adjust the parameters. But if you go on moving the bar without working through why something has happened, you quickly run out of the envelope, running the risk of things going wrong because nobody has had time to learn from the data.

Improving our ability to interrogate the HUMS data will eventually give us faster answers about sources of turbulence, cutting the time a helideck may be subject to operating restrictions while problems are investigated and fixed.

Tracing turbulence

For example, every offshore installation suffers from turbulence. It is caused both by physical structures and by the heat released by huge generators which the wind can then divert over the helideck and right into an approaching helicopter. You can't see it.

You're either suddenly in it or you're out of it - and in a helicopter, we are dealing with it in very close proximity to the helideck.

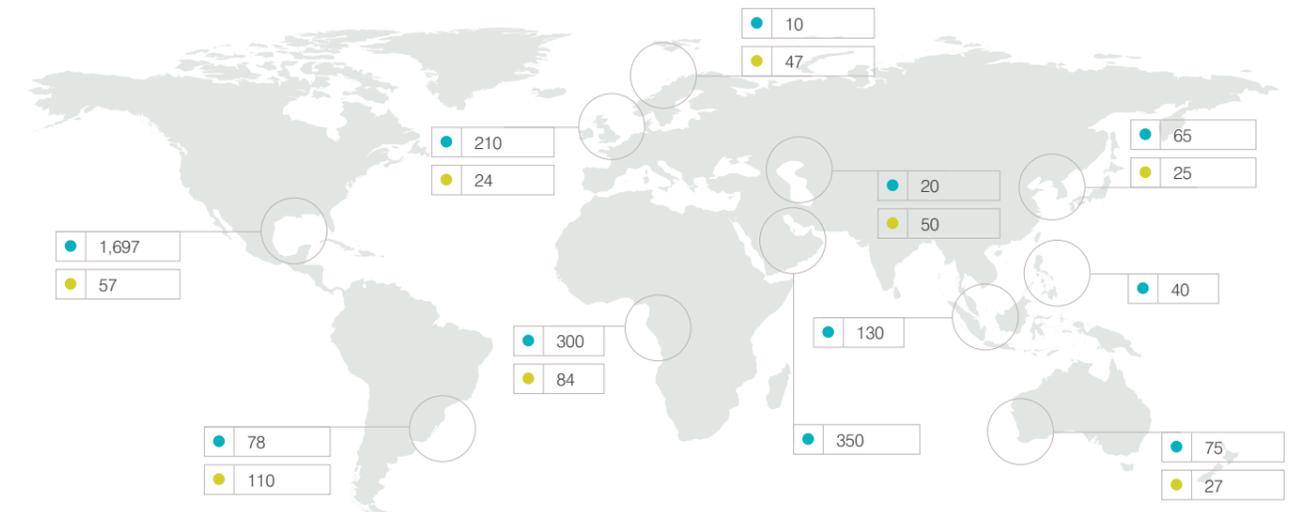
If turbulence is deemed too dangerous the HCA will impose operating restrictions until it is reduced. But to tackle turbulence you must pin down where it is coming from, and at the moment that means CFD analysis or full wind tunnel testing, both of which take time. In theory, we should be able to interrogate the HUMS data for quicker answers. HUMS records every control movement, so it is possible to analyse the pilot workload and extrapolate it to fine tune the data provided by the CFD or wind tunnel analysis, but we are not there yet. Developments in this field could significantly reduce the impact of turbulence issues on offshore operations.

The aluminium helideck

Helideck design is improving all the time. Nowadays the preference is for aluminium helidecks and you can have all sorts of supposedly non-slip profiles and surfaces with extruded aluminium. In fact, we have found that a helicopter will slide across profiled aluminium relatively easily so we are saying to helideck manufacturers that our preference is for a plain, flat aluminium plank and we will paint it with an approved friction coating.

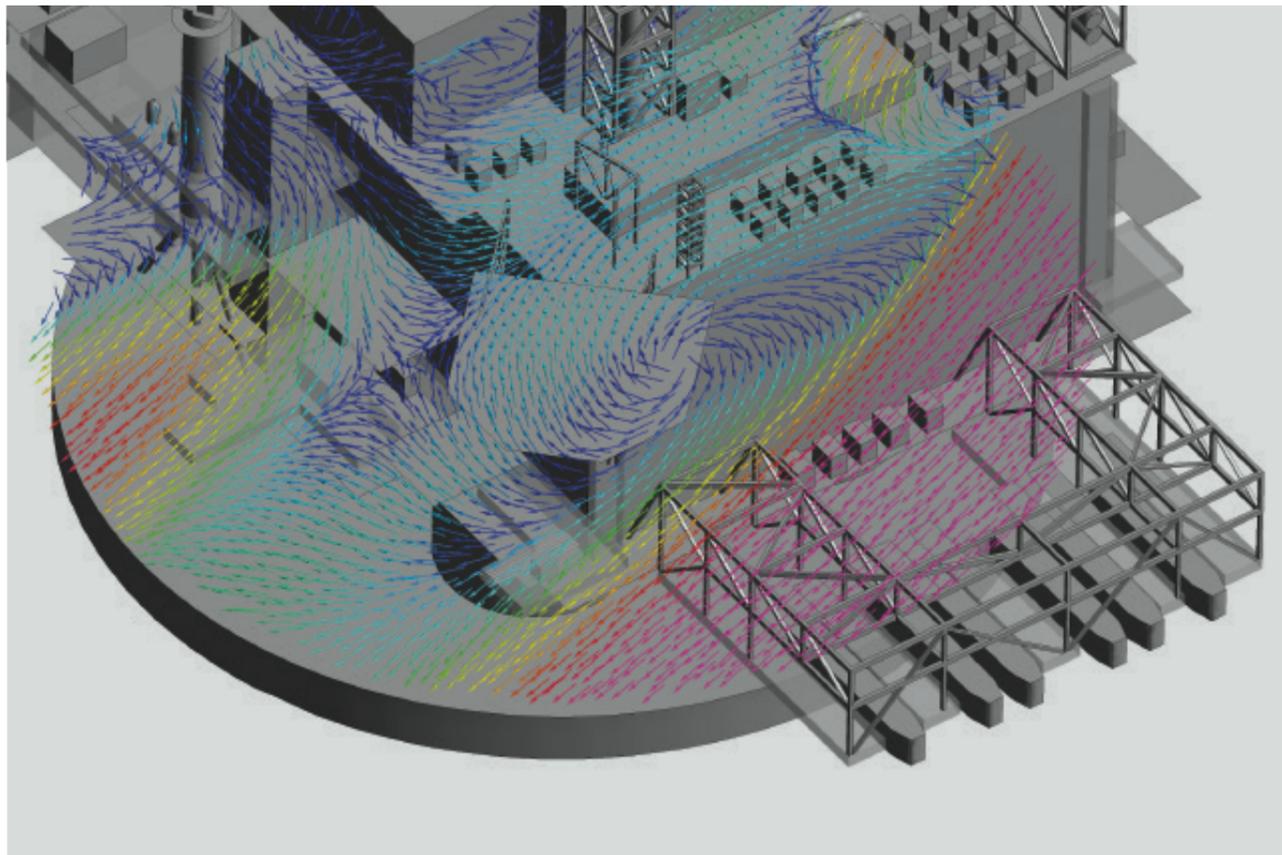
Research and the data from incidents drive continuous improvements in safer helicopter operations.

Estimated number of operational helidecks globally (Source HCA)



Helidecks

- Fixed with helideck
- Floating production with helideck



Suba Sivandran
Head of Oil and Gas,
BMT Fluid Mechanics

BMT has extensive experience in offshore helicopter operations and guidance having provided various services to the offshore industry for over two decades. BMT carried out several important helicopter operations research projects for regulatory bodies such as the UK Civil Aviation Authority (CAA) and Health and Safety Executive (HSE). Lessons learnt from these research projects were used to compile key industry regulatory documents such as the CAA Helideck Design Considerations – Environmental Effects and CAP 437.

From the industry experience gained from hundreds of projects, BMT has provided services to the offshore Oil & Gas industry to understand:

- Impact from turbulence, unburnt hydrocarbons and hot emissions on helicopter operations through computational fluid dynamics (CFD) modelling for design and to achieve CAP 437 compliance
- The optimal location and design of the helideck through wind tunnel testing and analysis of the wind flow over the structure for varying wind conditions



- Risks from wind, gusts, visibility and lighting through aviation forecast services to help enable safe helicopter operations and minimise unnecessary weather related downtime
- Influence of metocean and helideck motion characteristics through customised Integrated Marine Monitoring Systems (IMMS) to ensure compliance with CAP 437 and to assist in assessing the feasibility of landing a helicopter.

The information from these specialist services in CFD Modelling, Weather Forecasting and IMMS are unified and presented through BMT's new and powerful product Data Exploration and Analytics Platform for Actionable Insights (DEAP-AI). The platform provides a cost-effective solution to ensure helipad downtime is minimised whilst enhancing the industry's approach to safety in helicopter operations. DEAP-AI provides custom dashboards and allows users to delve into historical data as well as continuously monitor information as it is captured in real-time. BMT's approach to real-time helipad operations through DEAP-AI assists our clients in making more informed and faster decisions allowing ever more efficient use of helicopters and crews whilst ensuring safety remains a top priority.



J.J. Gerber

J.J. Gerber is Operations Services Manager at Cougar Helicopters, part of the Canadian VIH Aviation Group, which operates a fleet of Sikorsky S-92s providing transportation and search & rescue (SAR) services to the offshore oil and gas industry.

Helicopter flight times are getting longer as oil and gas exploration moves further and further offshore and we operate in increasingly remote and extreme environments. Safety and success depend on the reliability of machinery and weather forecasting, and Cougar is constantly seeking continuous improvement in these areas. Strong winds and cold weather present challenges in far northern climates - although engine performance is better in these conditions - while in the warmer climate further south there is more risk of thunderstorms.

Several things are essential for managing the risks: excellent training of flight and maintenance crew and support staff, having the best equipment maintained to

the highest standard, accurate weather prediction, and making downstream rig exhaust turbulence visual to pilots. Equipment reliability is at the forefront of our concerns. If a piece of equipment is supposed to last 1000 hours it should not go unserviceable at 500, or even 950 - but we have to plan for premature failure.

Long-range flights also raise issues around the human factors - five hour flight times, if the destination is fogged in, are challenging in terms of the long sit and limited bathroom facilities on board helicopters.

Technology has a big role to play in improving safety: automating what we can so the human role focusses on critical decision making and risk assessment. An

aware or self-reliant aircraft must be able to diagnose itself with pinpoint accuracy. If we can have 100% faith in the messages on our displays and indicators, it would go a long way to ensure flight crews take the right action or maintenance crews fix the right problem. Technology is also important for developing better materials, manufacturing processes, and quality control, and for improved air traffic control and even search and rescue capability. It is a broad subject.

Better interrogation of HUMS data is integral to further reducing risk. The ability to monitor HUMS in flight, whether streaming it to a ground station or some sort of intelligent onboard computer, is vital for a healthy fleet and assessing the cause of a failure.



Hot on the scent of victory

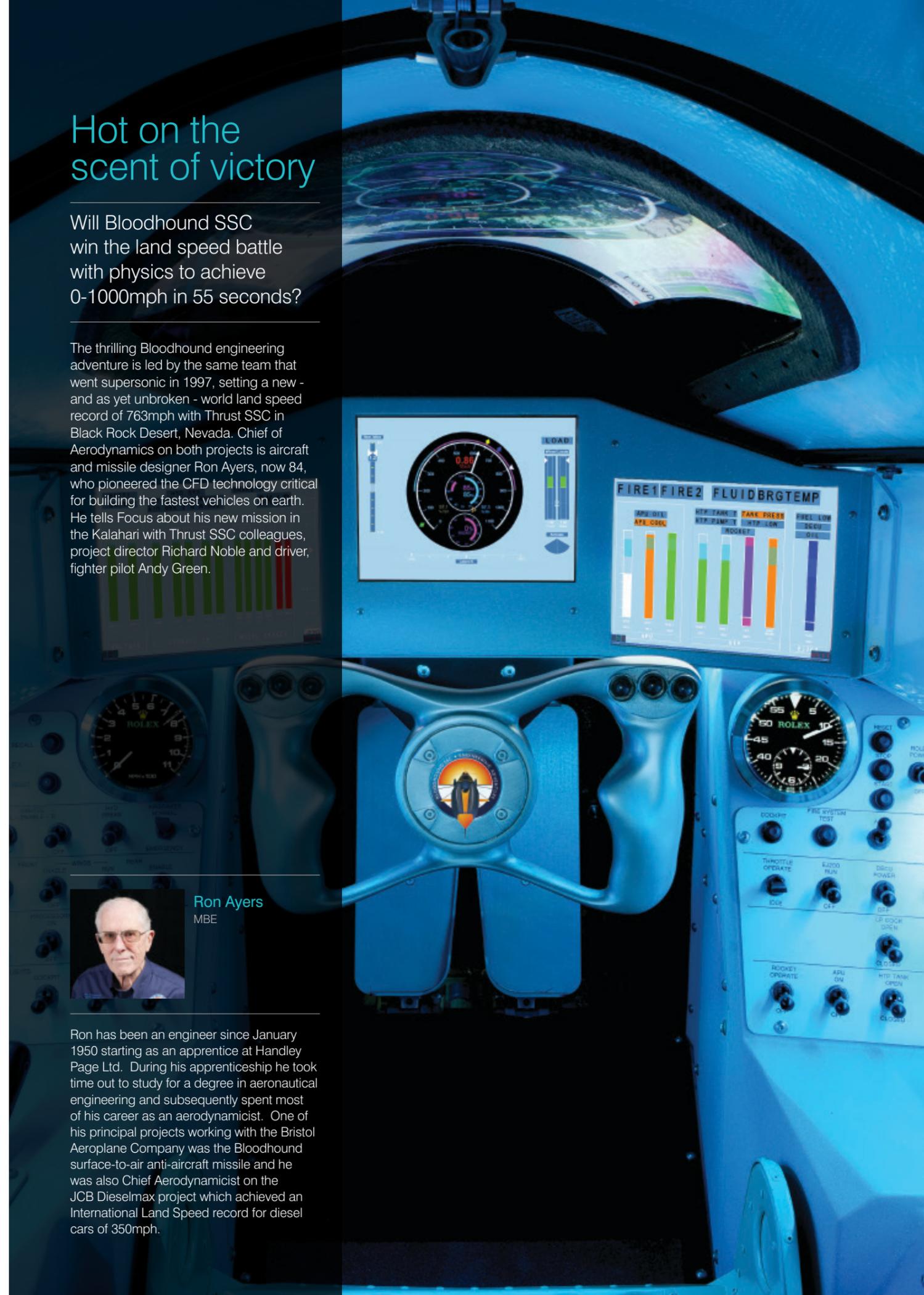
Will Bloodhound SSC win the land speed battle with physics to achieve 0-1000mph in 55 seconds?

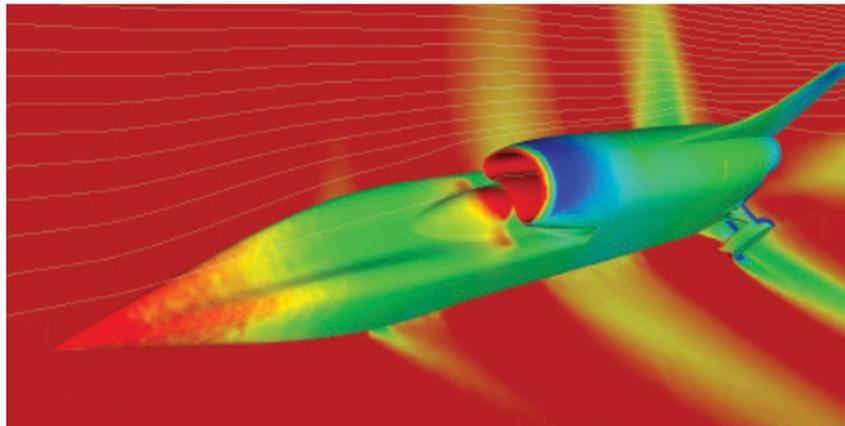
The thrilling Bloodhound engineering adventure is led by the same team that went supersonic in 1997, setting a new - and as yet unbroken - world land speed record of 763mph with Thrust SSC in Black Rock Desert, Nevada. Chief of Aerodynamics on both projects is aircraft and missile designer Ron Ayers, now 84, who pioneered the CFD technology critical for building the fastest vehicles on earth. He tells Focus about his new mission in the Kalahari with Thrust SSC colleagues, project director Richard Noble and driver, fighter pilot Andy Green.



Ron Ayers
MBE

Ron has been an engineer since January 1950 starting as an apprentice at Handley Page Ltd. During his apprenticeship he took time out to study for a degree in aeronautical engineering and subsequently spent most of his career as an aerodynamicist. One of his principal projects working with the Bristol Aeroplane Company was the Bloodhound surface-to-air anti-aircraft missile and he was also Chief Aerodynamicist on the JCB Dieselmax project which achieved an International Land Speed record for diesel cars of 350mph.





- 1: Bloodhound SSC (Stefan Marjoram)
- 2: CFD Poster (University of Swansea)
- 3: Thrust SSC (Richard Meredith Hardy)

When I met Richard Noble in 1992 and he said he wanted to build a supersonic car, my initial reaction was that it couldn't be done. Nobody believed you could break the sound barrier on land and many suggested it would be criminally irresponsible to risk someone's life trying. How would we know what the effects of shockwaves would be at ground level? Wind tunnel testing would require a tunnel with an 800mph rolling road – impossible – and computational fluid dynamics (CFD) was totally unproven in those days.

There was only one thing for it: I had to prove CFD could be trusted to predict how the vehicle would behave, otherwise we were dead in the water. So, we designed a 1/25th scale model of Thrust SSC, used a battery of rockets to accelerate it to 800mph in 0.8 seconds - that is a 50g acceleration - and measured the pressures on it. Eureka! The results agreed with CFD predictions. We could rely on the technology to design our vehicle.

Pushing boundaries

Twenty years on, the Bloodhound Supersonic Car has been designed using a computer cluster enabling 70 million space elements to explore the flow, compared with around one million for Thrust SSC, and the project is doing a lot to reinforce and mature CFD technology. But that is what Bloodhound is all about: pushing the boundaries of technology, sharing all our learning with the world, and

– its primary aim - getting young people everywhere interested in engineering by attempting something truly spectacular.

People often tell us how Thrust SSC inspired them to take up engineering or physics, but Bloodhound is engaging youngsters on an entirely different level. There is no other educational outreach programme like it in the world. More than 5,700 UK primary and secondary schools and thousands more worldwide, use Bloodhound materials in class and science clubs. Engineering student applications to the two universities directly involved in the design - Swansea, which does all our CFD computations, and the University of the West of England – have increased dramatically, and some small countries rely on our project data for their technology. All of that makes me very proud.

Despite the enormous extra speed with Bloodhound SSC, the Thrust SSC attempt was probably riskier because aircraft technology had never been used to design a car before. Also, today, we can monitor all channels live during a run so we get safety-critical information in real time. In fact, the project overall generates so much data that handling it is one of the new challenges for us with Bloodhound. We upload everything we do to the cloud, making all our test results immediately and freely available to assist other research projects and help fill gaps in knowledge worldwide.

From drawing office to laptop

Back in the 1960s, when I was involved in designing the Bloodhound 2 anti-aircraft missile after which our new supersonic car is named, we needed a vast drawing office and a small army of engineers doing computations to accomplish what is now routinely achieved by a small number of people with lap-tops. With Thrust SSC, we achieved our goal of setting a supersonic world land speed record in five and a half years for about £2.8m. In contrast, Bloodhound is a 12-year, £25m project, supported by huge corporate sponsors such as Rolls-Royce, Geely and Castrol, and most computations are done on a laptop. It is the ultimate challenge for a generation.

I fear that Bloodhound may mark the end of the world land speed record era - not for technical reasons but because we have run out of places to make such attempts. Salt flats are deteriorating and Black Rock Desert is now in too poor a condition thanks to lack of rain and the dust kicked up by festivals such as Burning Man. We literally scoured the world to find the right location to run Bloodhound. There were only 14 real possibilities and we have the best in Hakskeen Pan, which is only just large enough.



Simon Gould
Managing Director of
BMT Hi-Q Sigma

This iconic project has truly inspired people all over the world and for us to be involved was a fantastic opportunity. It was clear from the outset that the team was having lots of fun - however, there was increasing pressure from sponsors to commit to firm dates of delivery to allow them to justify the financial support. By applying some basic project management techniques to a highly complex engineering project such as this, we supported Richard and the team in developing a robust schedule for delivery. This was about creating a one team

ethos, providing a focus for the team and demonstrating the important contribution they were all making. Providing assurance of the project's delivery schedules to existing sponsors was key and financial backing for the project has intensified. BMT recognises that strength in STEM subjects is key to the future success and prosperity of the country and is proud to have worked with a project that has inspired future engineers and scientists. We look forward to witnessing the next big milestone in October!

Project overview

Bloodhound is a UK-led global project to build a 1000-mph car that will smash the world land speed record by 237mph - and inspire a new generation of engineers across the world.

Designed by F1 and aerospace experts, this is the most extraordinary and complex car ever built. It is powered by a jet from a Typhoon fighter and a cluster of hybrid

rockets twice as hot as a volcano, which together produce the equivalent of more than 135,000hp. That's eight times more power than all the F1 cars on a starting grid combined.

Huge metal wheels spin at 170 times per second as Bloodhound accelerates from 0-1000mph in 55 seconds, faster than a bullet fired from a Magnum .357 and louder than a

Boeing 747 at take-off. Bloodhound is a battle with physics.

The first record attempt - 800mph - is scheduled for this October in South Africa's Kalahari Desert, where a 12-mile race track has been created in the dry lake bed of Hakskeen Pan.



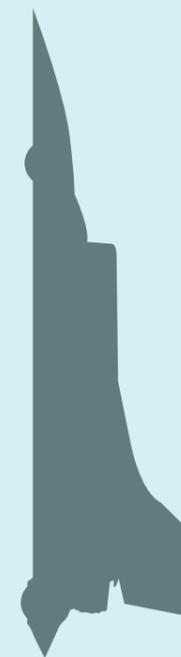
55 seconds

and 500mph-1000mph in 17 seconds



20 tonnes

The drag of the car at 1000mph



25,000ft

The altitude Bloodhound would reach if it were fired straight up into the air



135,000hp

Eight times more power than all the F1 cars on a starting grid combined.



3,000°C

The temperature in the rocket is twice as hot as the inside of a volcano

Designing a shipping super-highway

Ambitious scheme to give 21st century maritime transport a new route round the world

The Nicaragua Canal project is a game-changer. This hugely ambitious plan to give world shipping an oceanic super-highway that will cut transport and consumer costs, reduce CO₂ emissions, and better connect trading partners across the globe, is the largest civil engineering project in history. It will - says the private infrastructure development firm behind it - change the world.

Operational requirements of 21st century global trade have been at the heart of the Nicaragua Canal design from the outset, explains Pang Kwok Wai, Executive Vice President of the Hong Kong Nicaragua Canal Development (HKND) Group. He describes the planned 276km canal to link the Atlantic and Pacific oceans across the heart of Central America, as the "Suez of the West".



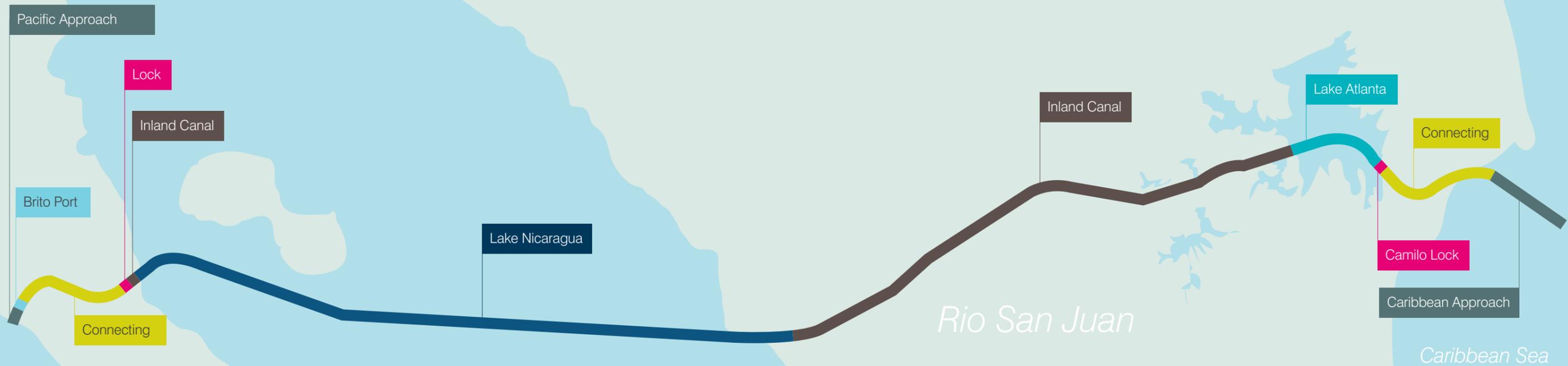
Pang Kwok Wai
Executive Vice
President

Mr. Pang Kwok Wai has over 30 years' experience in the transportation industry covering operations, maintenance, management, development and multi-discipline large scale projects. Mr. Pang obtained his Master of Business Administration and since 2006 he has been a visiting professor of the Beijing Jiaotong University and an advisor on development of railway safety and signaling systems in China. He has been a Fellow of the the Institution of Railway Signal Engineers (U.K.) since 1995, and is at present the Chairman of the Institution of Railway Signal Engineers (Hong Kong Section).

Aguila Port



Chontales



Fast facts about the Nicaragua Canal

276 km

Length (171 miles)

27m

Depth (88.5 feet)

195m

Typical bottom width (640 feet)

40 hours

Transit time

10-11,000

Ships per year

A-B

Shortest shipping route between Asia and many US East Coast ports

Pacific Ocean

Alajuela

Caribbean Sea

The Nicaragua Canal will give the global fleet of ever bigger ships a faster, safer, more efficient route between the Atlantic and Pacific. For vessels travelling from Northern Hemisphere Asia to North America, it represents a saving of some 500km over the Panama route, reducing sailing time and maritime transport costs.

Targeting Suezmax

Learning lessons from other canals, we can ensure the Nicaragua Canal remains competitive. Central to our competitive advantage will be serving the Suezmax market segment (and upwards), while delivering the ultimate customer-friendly experience, simplified customs and immigration procedures, and Hong Kong-style efficiency to reduce the associated costs of maritime trade.

Engineers must have operational insight to design something truly customer-friendly and BMT's role in the project has been critical for informing a canal design that puts the needs of its customers first. For example, BMT aligned the Brito port and lock with respect to the strong incident winds in a way we had not considered, to ensure it is easier, quicker and safer for ships to dock, transit the lock and they require fewer tugs.

Originally, we were planning a deeper canal, but BMT advised us on world fleet development trends that has informed the Canal market segmentation and construction phasing. This insight not only enabled us to make huge capital savings, but also to position the Nicaragua Canal, in combination with the Suez Canal and Malacca Straits, as a new link in a shipping super highway, circumscribing the globe.

Ocean-to-ocean in two days

More than 90% of the vessels currently forced to sail via Cape Horn because of the size constraints of the Panama Canal, will be able to transit directly through the Nicaragua Canal, which will have adequate water levels throughout the year to guarantee no draft restrictions, giving ship owners certainty around waiting and total transit times. Average transit time (including waiting to enter the Canal) will be under 2 days – less than that frequently encountered at Panama.

Captains do not like squeezing big ships through tight locks or working with tugs in confined spaces, so we have designed our locks to be as wide as possible and will make much use of combined alternatives to handle mooring lines efficiently and safety during lock passage - avoiding risk and insurance complications.

Indeed, safety is a key consideration throughout the project and our basic principle is to minimise risk by design. For example, the two locks will be built deep inland, well away from the ocean-front environment and protected from the effects of a possible tsunami. A safer canal gives better protection to investors and cuts insurance costs.

Big project, big challenges

Inevitably, as the largest civil engineering project in history, the Nicaragua Canal faces a series of challenges, although these are mainly around the enormous logistics and supply chain requirements demanded by its huge scale. Nicaraguan infrastructure is currently weak which is why we have decided to build roads, ports and oil storage facilities as the first step - to ensure the supply of raw materials for the project.

The Nicaragua Canal project is of strategic significance to global trade and the environment. It will also boost interconnection between regions, helping to unlock new sources of economic growth in the Asia-Pacific region, enhance competitiveness, and meet the long-term development needs of world shipping.



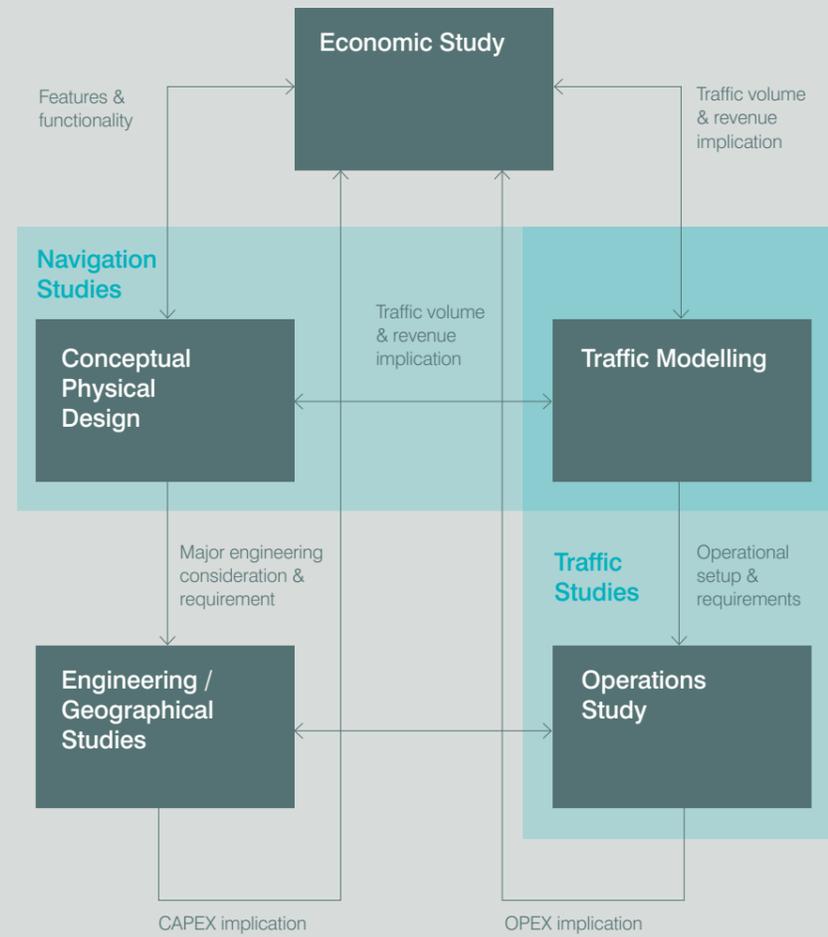
Richard Colwill
Managing Director of BMT Asia Pacific

BMT has been supporting HKND undertaking a series of marine and port assessments for the Nicaragua Canal to assist the development and validation of the canal's and associated ports design and operations.

For the canal, BMT has drawn on experience with both the Suez and Kiel Canals to develop a channel profile suitable for the staged development for vessels through and beyond Suezmax size. Sophisticated navigation and transport simulation has been deployed to assist in the development of a design that balances excavation CAPEX with operational safety, efficiency and capacity.

For the ports, BMT has updated the business case for the Canal's Pacific and Caribbean ocean ports to identify the ports' potential competitive positioning along this new key artery of global trade. As well as supporting the Canal's operation, the ports are also the beachhead for the construction phase, and ongoing work is developing the Reference Design, specification and costing of these facilities – a challenging task in an area combining alluvial sediments and earthquakes.

A major canal project embodies intimate linkages between marine, engineering and economic factors:



Why a Nicaragua Canal?

Modern container ships have outgrown the 100-year-old Panama Canal. Since the mid-90s they have tripled in size - a growth rate that has taken even shipping experts by surprise.

Today, the expanded Panama Canal can accommodate vessels up to 13,000 TEUs* but with draft restrictions, while the Nicaragua Canal will take fully loaded ships almost twice that size at up to 25,000 TEUs.

The global fleet of ultra large container ships – those bigger than 13,000 TEUs

- has grown by 45% in the past five years, and is set to increase by 50% over the next 3 years: as a new fleet of leviathans ordered in the recent years exits the shipyards. These vessels are now established as the work horse of east-west trades, but are restricted in crossing directly between the Pacific and the Atlantic.

* A ship's cargo carrying capacity is measured in TEUs, or Twenty-Foot Equivalent Units. One TEU equates to one standard 20ft container.

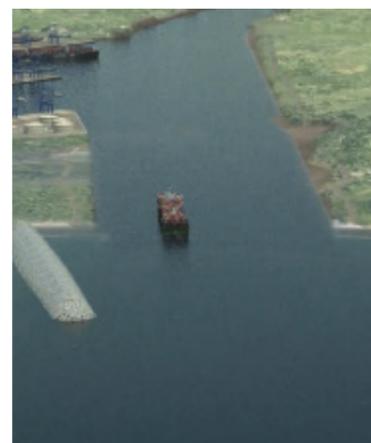


More than a canal...

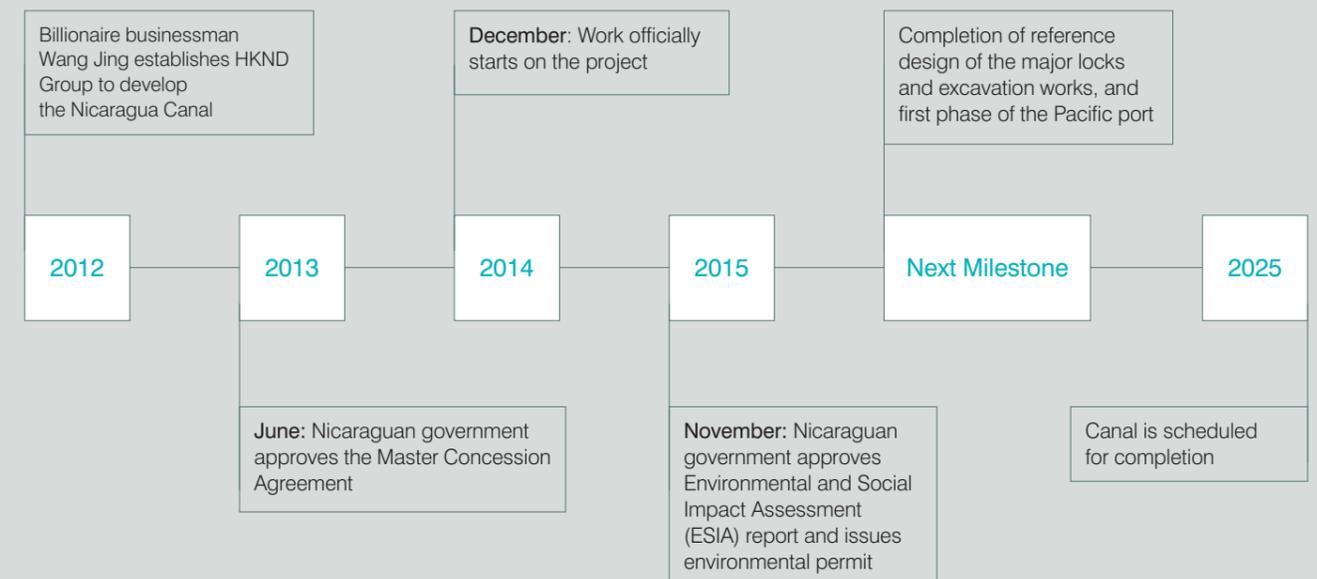
The Nicaragua Canal project includes:

- Two ports
- A free trade zone
- Resorts
- An international airport
- A network of new roads and bridges

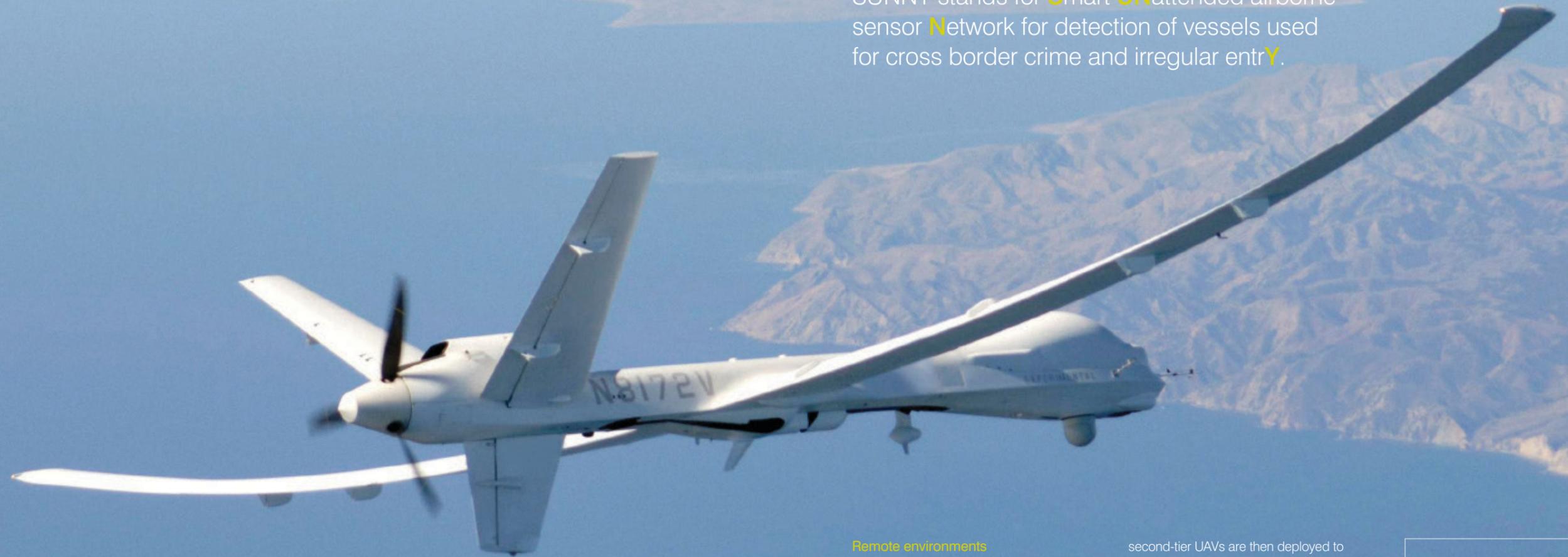
HKND Group says the project will ignite a new era of growth and opportunity for Nicaragua and the entire region, stimulating industry and delivering many economic spin-offs. It will also protect the country's natural ecosystems and wildlife, and respect its people, culture and heritage.



Timeline



SUNNY stands for **S**mart **UN**attended airborne sensor **N**etwork for detection of vessels used for cross border crime and irregular entr**Y**.



Outlook is **SUNNY** for combatting cross-border crime

BMT's Research Directorate is leading the development of a new intelligent aerial sensor network to monitor the external borders of the EU in an effort to combat cross-border crime and prevent the loss of migrant lives at sea. The SUNNY cooperative research and development project is currently testing the integration of these systems and preparing for the final demonstration of four different unmanned aerial vehicles (UAVs) working together to thwart drug traffickers and people smugglers.

Remote environments

The sheer scale and remoteness of some of the EU's border areas, both on land and over sea, make them extremely difficult to patrol effectively. Legacy sensors and communications systems developed are unsuitable for the job, and limited resources compound the challenges for national authorities.

SUNNY, a four-year cooperative research project co-funded by the European Commission, aims to find a solution for intelligent aerial border surveillance by improving sensor technology, data transmission and real time data processing. The objective is to develop a reliable, cost effective and scalable sensor-network-in-the-sky to detect and track illegal border crossings, vessels carrying contraband or people whose lives are at risk. The small wood and glass-fibre boats favoured by criminal traffickers are very difficult to find, identify and follow using existing sensor networks.

A two-tier network

The integrated two-tier SUNNY network features four heterogeneous UAVs – three fixed wings and one vertical take-off and landing – each carrying a different array of sensors and feeding real-time information to each other and back to the SUNNY base station.

The higher altitude, first-tier radar sensors monitor large areas, giving ground control the big picture and identifying possible targets for further investigation. Fed with this information,

second-tier UAVs are then deployed to collect evidence for more accurate target recognition and threat evaluation.

Second-tier tools include cameras, infrared capability for effective tracking in all weather and light conditions, and hyperspectral imaging for identifying materials; for example, to determine whether a boat is carrying people.

Central to the project is the development of cutting-edge on-board processing and communications technology: critical for improving efficiency and reducing costs of aerial border surveillance. Working with 18 partners (from 9 Member States, including authorities nationally responsible for border surveillance), SUNNY has moved well beyond other research projects.

Live testing

Ground-to-air testing began early this year in Spain, then moved to Portugal, and on to the NATO airbase in Crete, where the final demonstrations in October will showcase the system's abilities, both to find a ship carrying contraband and in the context of a search and rescue operation.

When the project concludes, the results will be reviewed to determine whether UAVs are suitable for border surveillance within the framework of EUROSUR, i.e. the information-exchange framework designed to improve the management of Europe's external borders, through which EU Member States co-ordinate efforts to police their borders and save lives at sea.

As well as leading the management of the SUNNY project, BMT's technical role is to integrate all the information collected by the UAVs and provide mission controllers with a clear and comprehensive picture of what is happening along their borders in real time.

"A central command and control station will give situational awareness of the entire operation to a mission controller," explains Luke Speller, Lead Senior Scientist. "Mission controllers will be able to see all assets available and deployed, where they are going, what they have detected, potential threats that require further investigation, and so on. The information will be delivered and displayed to the users in real-time providing a mission overview without causing information overload.

Currently the interface uses a web-based technology stack to provide a multi-screen desktop experience. Further work will focus on extending this to a modularised 3D experience with virtual reality (VR) capabilities."

BMT news

from around the globe

A UK First for Decommissioning Market

A specialist team of companies have come together as part of their commitment to deliver an approved decommissioning programme under one collaborative offering. Integrated DECOM will offer independent front-end engineering and environmental solutions providing integrated support for oil and gas operators looking to retire redundant facilities without the burden of an in-house overhead.

With over 20 years' expertise and knowledge of successfully delivering the major UKCS decommissioning projects to date, Costain, Axis Well Technology, BMT Cordah and DNV GL have the capability and capacity to deliver the entire decommissioning work scope up to the approval of the project's decommissioning programme, from subsurface to structure, through a single point solution.



BAE Systems Turns to BMT for Queen Elizabeth Class 3D Training

BMT Defence Services has been selected to provide an innovative 3D walkthrough training system for the Queen Elizabeth Class (QEC) Aircraft Carriers, supporting the BAE Systems' Industrially Suitable Qualified and Experienced Personnel (SQEP) Training Programme.

The team at BMT will utilise its next generation training solution, Engage, to develop a 3D walkthrough training system that supports the teams working closely with the QEC Aircraft Carriers in Portsmouth.

BMT's Engage platform will form the basis of a 3D environment and allow ship's staff, visitors and the BAE Systems employees to move freely around the different compartments of the QEC platforms. This will ensure that they are familiar with the ship's layout, escape and evacuation routes and are able to identify key pieces of safety equipment. This will form a fundamental part of their training for this new class of ship.



Project Norse – Breaking the Mould of the Traditional Explorer Yacht

Oliver Stacey Design, in collaboration with BMT Nigel Gee, is pleased to present Project Norse, an 80m sail-assisted exploration yacht. The concept details a rugged trans-oceanic exploration vessel, capable of voyaging to both Poles, crossing any ocean and taking in the most awe-inspiring destinations.

The two companies came together with the brief to present a fresh interpretation of the explorer vessel genre and develop a concept designed for maximum self-sustainability, global range and minimal environmental impact.

The yacht's simple, low-aspect sail plan features three identical wing masts, in combination with matched in-boom furling mainsails. This configuration maximises reliability and flexibility, while requiring minimum crew effort in deployment, operation and recovery. In line with the vessel's long-range and extended self-sustainability, Norse is built to Ice Class 1d and complies with Category C requirements of the Polar Code.



BMT Launches New Operating Company

BMT Group has announced the launch of a new commercial operating company that will focus on providing highly specialised services to the global shipping and ports market. BMT Ship & Coastal Dynamics will bring together BMT's current teams based in the UK and the Netherlands to fully integrate a range of complementary expertise in floating and fixed structures, as well as near shore and coastal wave modelling.

BMT's REMBRANDT navigation simulation system will form part of the new company's portfolio, with a proven track record of over 25 years in supporting the development of new ports and terminals. BMT's Search and Rescue Information System (SARIS) will complete the company's portfolio of services. SARIS is the market leading search planning tool with a global client base, including the UK's Maritime Coastguard Agency.



BMT Partners with Maersk



In partnership with Maersk, BMT Surveys has developed an online Marine Application for survey, Trend Evaluation and reporting (MATE) platform, which provides real time data on the condition of vessels and changes in that condition over time.

As part of Maersk's extensive inspection programme, BMT carries out over 100 vessel inspections a year providing a vessel scoring system on areas including: cargo care, pollution prevention, certification, navigational incidents and structural condition. MATE offers an interactive, moderator environment for developing and managing inspections, data analysis and provides customised reporting.

BMT Wins Dubai Contract

BMT Fluid Mechanics has been appointed by Aurecon as the wind engineering consultant for 'The Tower at Dubai Creek Harbour', the new icon by Emaar Properties, designed by world-renowned architect and engineer, Santiago Calatrava who is leading its design and engineering work. Calatrava has chosen global engineering consultants, Aurecon, as the engineer/architect-of-record with whom to collaborate on a range of design and technical features for the ambitious project.

The supertall building's striking design includes a distinctive net of steel cable stays that attach to a central reinforced concrete column that will reach into the skies. At the top of the tower is an oval-shaped bud that will house several observation decks, including The Pinnacle Room, which will offer unprecedented, 360-degree views of the city and beyond. It will also serve as a beacon of light at night, with a lighting system that will evoke the features of a flower bud, as it seemingly hovers atop the structure.



New LNG Ferries Contract for BMT Nigel Gee

BMT Nigel Gee has announced a new project to design two 70m aluminium-hull catamaran RoPax ferries for Rederij Doeksen. BMT will be responsible for concept through to production design.

Both vessels, which will be built by Triyard Holdings subsidiary, Strategic Marine in Vung Tau, Vietnam, will serve the Friesland Islands connecting Harlingen, Terschelling and Vlieland in the Netherlands and enter service in April 2018. The exterior and interior styling is being performed by Vripack. The vessels are single fuel LNG, with both main engines and generators running off the LNG supply. The vessels will offer significantly lower emissions than conventional steel and diesel powered vessels, with at least a 30% reduction in CO₂ and 100% reduction in NOX/SOX.



BMT Secures Contract with Endeavor Energy

BMT Asia Pacific has been appointed Owners Engineer and lead design consultant by Endeavor Energy, for the development of the LNG storage and regasification facility as part of the Songon Gas-to-Power Project in Côte d'Ivoire.

Songon, a greenfield development, will consist of combined cycle gas to power generation with an integrated fuel solution, featuring purpose-built LNG infrastructure and a floating storage and regasification unit (FSRU). BMT will be conducting FEED level studies including operability assessments, infrastructure design and optimisation studies for the supply of gas from the LNG FSRU via subsea infrastructure to the onshore gas turbines outside Abidjan, Côte d'Ivoire.



Merger Sees Launch of BMT Asset Performance



BMT Asset Performance has been launched following the recent decision to merge BMT Cadence and BMT Reliability Consultants.

Mike Prince, Managing Director of BMT Asset Performance, comments: "Our new name deliberately seeks to reflect what our new company is all about - using our knowledge to help our clients achieve an optimum and assured performance from the full spectrum of their organisation's assets."

Bringing together the strengths of both businesses, BMT Asset Performance

will provide a compelling offering to organisations that depend, for their success, on a mastery of complex engineering. For a variety of clients within the defence, transport and energy industries, the company underpins more than 35 years of enterprise-level consultancy, solving real-world business critical problems, with unmatched engineering analytical pedigree; problems such as the optimum asset mix, the cost and value of ownership through-life and the effective management of variation and change.

On the move

Dr Sukhy Barhey



Dr Sukhy Barhey has been appointed as Director to lead the implementation of BMT Asia Pacific's strategy and expand its specialist service offering across the Region.

An expert in Safety and Risk management with over 25 years' experience in Transportation & Rail, Marine, Power and Oil & Gas sectors, Dr Barhey has extensive experience in new service development, market expansion and client relationship management. Prior to joining BMT, Dr Barhey held senior positions at Lloyd's

Register, Parsons Brinkerhoff, DNV and BP, based out of international locations including Aberdeen, London, Hong Kong and Houston.

Working closely with Dr Colwill, Dr Barhey will facilitate the growth and development of BMT's Advisory, Environmental, Risk Management, Rail, Maritime Engineering and Naval Architecture businesses in Singapore and Hong Kong, whilst further facilitating regional delivery across Asia.

Dr. Michelle Cushion



Dr. Michelle Cushion has been appointed Managing Director of BMT Fluid Mechanics. Michelle will also take on the role of Global Director of Wind Engineering.

Responsible for implementing the strategy, direction and policies of the business, Michelle will be focusing on further developing a culture of customer satisfaction and teamwork, capitalising on the organisation's people and skills worldwide. By sharing its technical prowess, BMT can grow its targeted customer base, offering innovative services in an ever-changing global market.

Peter French, Chief Executive of BMT Group, comments: "It's great to have Michelle on board. Her business acumen coupled with her strong technical abilities made her the ideal candidate for this role. BMT's market share of wind engineering in civil construction is growing – 2017 will be focused on further expanding this market share in core regions."