

» Newsletter

IMECHE WEST CUMBRIA EDITION AUTUMN / WINTER 2014



PRESIDENT MARK HUNT'S CUMBRIAN TOUR



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Dear Colleague,

Welcome back. First of all I'd like to thank the committee, young members and volunteers for making my first year as Chairman very enjoyable. It has not been without its challenges though. Falling numbers in both committees has put extra pressure on what is after all a labour of love, to give back and encourage people to get involved in engineering. To this end, our aims this year are focused on developing our partnerships within education, local companies and other institutions to increase awareness of the potential that lies within the Engineering Industry.

Now, with the new season about to start, I would like to introduce you to this autumn's edition of the West Cumbria Area Newsletter. Enclosed, you will find write-ups of the engineering activities we have undertaken over the last 6 months, including our talks on Innovation Imaging Technology by Createc, Welding - an objective discussion between designer and fabricator, and M Sport on the Bentley Continental GT3. There are also visit write-ups; Mitchell Dryers Carlisle, The National Railway Museum Shildon organised by the young members, and to Broughton Moor Dump, formally a Royal Naval Armament Depot, now owned by The Derwent Forest Development Consortium.

There is also an article about Mark Hunt, IMechE President's first formal visit to the area and our 10th Annual Dinner at Lakes College West Cumbria. Not forgetting features on our regional educational activities.

On the back page of the newsletter you will find a poster depicting our Autumn/Winter Events, which include a talk on Vehicle Collision Investigation

given by our committee member and Hon Secretary Simon Farrell, a visit to the Lake District Creamery, a talk on Devonport Dockyard and an update to the very interesting Solway Gateway Project.

Work will be shortly commencing on planning our IMechE West Cumbria 11th Annual Dinner for 2015, which will be even bigger and better this year, so watch this space (or rather our website www.imechewestcumbria.org.uk) for details. Talking about our Annual Dinner; I would like to close by once again thanking all our sponsors for supporting the occasion. Without their fantastic support, we would not have the funding to continue to grow our educational initiatives, something which is the cornerstone of what we as the West Cumbria Area Committee are here for.

Finally, I have some sad news and some good news. First of all the sad, where Lloyd Neale has announced his most well-earned retirement from our committee after 12 years. I would like to thank Lloyd for the work he has done and wish him well for the future. The good news is to congratulate Peter Sutton, seen in the attached photo with me, on his acceptance to Durham University and winning the IMechE West Cumbria Bursary award.

I look forward to seeing you soon.

Best Wishes.

David McArthur BEng AMIMechE
Chairman – IMechE (West Cumbria)
david.mcarthur@sellafieldsites.com

ATKINS

DOOSAN Doosan Babcock

James Walker

WEST CUMBRIA AREA COMMITTEE NEWS

SEEYA, GAN CANNEY LLOYD



Lloyd (centre) stands with committee members at the Broughton site.

It was with much sadness that IMechE West Cumbria bade a fond farewell to one of their stalwarts, Lloyd Neale on Friday 18th July.

Lloyd, a retired Project Manager with the United Kingdom Atomic Energy Authority (UKAEA), has been the IMechE West Cumbria Website Administrator since 2002, but after 12 years of dedicated service he and his wife have decided to sell up their family holiday cottage business in Redmain and move to the North East to be closer to their family. To send Lloyd off in style, the area committee arranged to have a tour of the former Royal Naval Armament Depot at Broughton Moor – “The Dump”, by Chairman of the Derwent Forest Development Consortium (DFDC), and dear friend of IMechE West Cumbria, Nigel Catterson.

DFDC, the leaseholders of the Broughton Moor site, is undertaking a major, self-funded project to transform this former munitions site into “Utopia” – a multi-million pound Eco-Experience. Combining eco-housing, an organic farm, a festival site and a visitor centre where people can learn about sustainable living and care for the environment, over the next 30+ years the site will be completely self-sustaining and provide its own power through wind turbines, anaerobic digestion and solar power. Sustainable Engineering Solutions has always been a passion for Lloyd, so this enlightening tour of what could be the largest open-access Eco Project in Europe was well received by Lloyd and his fellow committee members.

Nigel kindly showed us what remains on the

site of the former Arms Depot, and the remnants of the site infrastructure, including the main line and narrow gauge railway systems. We also got sight of what remains of the site's laboratory and warehousing buildings, however we were not able to look inside any building due to health and safety reasons, as they are all currently derelict. Nigel also outlining DFDC's plans for the site's development, such as the Environmental Impact Assessment work, and structural assessments of buildings for potential future use. Site remediation work has already begun with the planting of several 27 thousand broadleaf trees earlier this year, in an area of the site named the Jubilee Wood in honour of the Queen's Diamond Jubilee.

The evening was rounded off with the presentation of a small 'Thank You' gift to Lloyd from the Committee, followed by a fine meal and a few drinks at a local restaurant in Cockermouth.

Although Lloyd has agreed to continue to provide 'online' assistance with the IMechE West Cumbria's website from Northumbria, our heartfelt thanks and best wishes for a 'proper' retirement go to Lloyd for the tireless work he has done over the years in setting up and maintaining the website. Our thanks also extend to his dedication to the rest of the Area Committee's activities, including organising several talks/visits and assisting with our STEM activities across the county.

David Williamson, IMechE West Cumbria

MALLARD 75 - THE GREAT GOODBYE

This year, to mark the 75th anniversary of the Mallard's famous run setting the world speed record for a steam locomotive at 126mph, the National Railway Museum assembled the six remaining intact A4 Pacific class engines in celebration of the event.

Union of South Africa, Dwight D. Eisenhower, Dominion of Canada, Sir Nigel Gresley, Bittern and Mallard herself were brought together at Shildon providing an unique opportunity to see these locomotives together. Two of these locomotives are usually housed the other side of the Atlantic and others are owned by private individuals, so this was very likely to be a once in a lifetime event.



The trip was organised by the Young Members to go and see these fine examples of mechanical engineering, designed by a former President of the Institution, as well as the rest of the museum's collection. Such attractions proved irresistible to a broad range of ages with 19 members and 8 non-members making the trip, some from as far as North Wales, proving that romance of steam can still captivate a wide audience.

Visitors were given the opportunity to climb into the cabs of these renowned locos and talk about their history and operation or even go for a ride

on a train pulled by Sir Nigel Gresley that was in steam on the day.

After a day of exploring the A4's and the museum's other exhibits, an interesting lecture was given by the curator of the museum on the history of rail speed records from the Rocket right up to the high speed electric trains of the present day. After the talk and the Q&A session there was time for some more sight seeing before heading back to the bus for the return trip to Cumbria.

Simon Walsh, IMechE West Cumbria

**IMPROVING
THE WORLD
THROUGH
ENGINEERING**

IMechE West Cumbria: www.imechewestcumbria.org.uk

IMechE WC Young Members: nearyou.imeche.org/near-you/UK/North-Western/West-Cumbria-Young-Member-Panel

IMechE UK: www.imeche.org

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EXPANDING LOCAL KNOWLEDGE

JUST STICK A BIT OF WELD ON IT...



Heard the one about the Designer and the Fabricator arguing in the pub? Well I have many times, every time I went out for a few drinks with my mates on a Friday night! Always the same discussion:

Designer: "My job would be so much better if the fab-shop would just follow my drawing..."

Fabricator: "That job could have been done for half the price if only the design office had thought about how I was going to weld it..."

The idea of getting designers and fabricators together to air their views publicly (and professionally of course) rather than having an eternal "them and us" debate, the plan being to investigate which side doesn't listen to who in engineering fabrication, sounded promising.

So, on the 11th March 2014 at Lakes College West Cumbria, the "bout" was set. In the 'Red Corner' we had "*The Designer*" aka Peter McHarry, a mechanical designer working in the Mechanical Design Support Department for Sellafield Limited. Following a mechanical apprenticeship, Peter's engineering career started in 1985 with UKAEA as a Designer, and included a spell as a Quality Assurance and Control Audit Manager with AEA Technology. In 1993 he joined British Steel at Workington as a Mechanical Designer before re-joining the daily commute to Sellafield in 1998. He has remained to this day providing mechanical design support to THORP, Waste Encapsulation Plants and Magnox East River.

In the 'Blue Corner', we have "*The Fabricator*" aka Steve Carruthers, a highly qualified and experienced Welder/Fabricator currently working as a Senior Project Inspector for the Inspection & Certification Department at Sellafield Limited. He has a wealth of experience in Welding, Welding Supervision, Quality Control and Project Management, with local companies such as Forth Engineering, NuMech Engineering and James Walker & Co. He has even had a spell as the Managing Director of his own Welding company, which was a very successful venture running until 2008.

Actually, the talk was never a "them and us" debate. It was an open, frank and plain talking presentation which highlighted the good and bad points of both sides. Peter and Steve were a great double act, giving a highly informative talk on the issues surrounding welding design and welding fabrication, as well as the effects that the lack of two-way communication has on time, cost and quality of fabricated components.

First of all Peter provided the designer's technical view point. He highlighted many drawbacks of the process. Issues included: problems from poor weld design, limitations of mechanical design office's knowledge of welding, local costs of complicated weld solutions or procedures to recover manufacture, hidden costs due to Technical Queries, investigation, re-calculation and re-work and the failure of the vital feedback loop.

Steve followed on by offering the fabricator's practical view point, with several exhibits with photographic illustrations, each incisively

demonstrating where design-manufacturing communications failures have lead to ridiculous escalations in cost and/or delivery time.

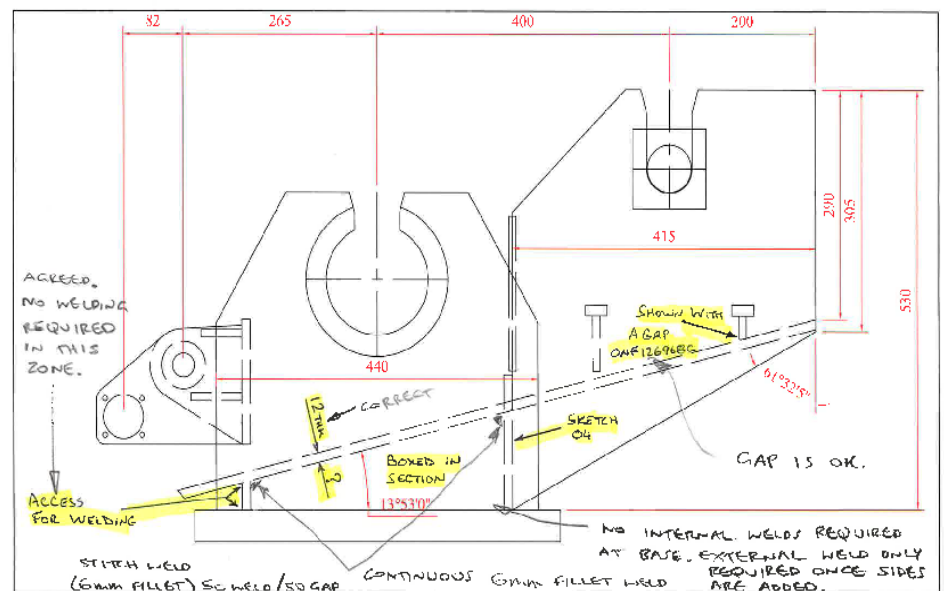
This exceptionally well-received talk, which was highly engaging and interactive with the audience, highlighted that if mechanical designers are not careful they can fall into the trap of thinking of a weld as the "easy option" and lead them to not properly considering a weld connection. Questions such as: What is the weld's function? What load is the weld taking? How will the weld be performed? Where will the weld be performed? are all things that the designer would consider when choosing a weld instead of, for example, a bolted connection. Connections such as these somehow become forgotten when it comes to a welded fabrication.

The talk also identified a whole raft of other issues which can lead to a failure of the "feedback loop" from manufacture to the design team. Furthermore, no feedback means no learning from experience. If fabricators don't tell designers where they are getting it wrong, the same mistakes will continue to occur, leading to ever increasing manufacturing costs.

David Williamson, IMechE West Cumbria



From left to right: Steve Carruthers, Peter McHarry and David Williamson



An example of a poor engineering drawing - no wonder fabricators sometimes tear their hair out with frustration!

PRESIDENTIAL VISIT & 10TH ANNUAL DINNER 2014

GROUP CAPTAIN MARK HUNT'S PRESIDENTIAL VISIT



IMechE President, Mark Hunt, presents Energus with the accreditation of its Monitored Professional Development Scheme (MPDS)

On his first visit as President of the Institution, Group Captain Mark Hunt visited West Cumbria, North West Region educational and industrial organisations, with local committee members.

On the 5th and 6th June, 129th Group Captain Mark Hunt, 129th President of the Institution of Mechanical Engineers visited West Cumbria, North West Region. The visit was organised and guided by West Cumbria Young Members Chair, Jen Corbett.

The first day of the two day tour, the Presidential delegation visited the education and apprenticeship providers at Energus, hosted by Mike Smith, Chief Executive Officer Energus, Nigel Couzens, Executive Director Energus and Gary Jones, Principal and Chief Executive, Energy Coast UTC. Following a brief introduction to the training college we were guided around the facility by four of their apprentices Aidan Coulthard, Bethany Simpson, Danny Dougherty and Lydia Rowell. The President asked the apprentices about the projects they have been working on and the challenges they had overcome along the way. It was great to see all the students we met had secured employment for when they complete their apprenticeships and that the college has 16% female students studying STEM, well above the national average. The visit ended with a presentation to Energus for the accreditation of their Monitored Professional Development Scheme MPDS.

The tour continued with a visit to Manchester University's Dalton Cumbria Facility, hosted by Kevin Warren, Commercial Director, where we toured the state of the art facility used by PhD

students and industry specialists for research in radiation science and nuclear engineering.

The day concluded with the 10th Annual West Cumbria Area Annual Dinner organised by David McArthur, West Cumbria Area Chair. The drinks reception gave the president a great opportunity to talk to some of the 150 guests from local companies. David McArthur, Jen Corbett and Mark Hunt gave short presentations about what IMechE are doing in the local area and where the Institution is heading. The four course dinner was served by catering students at Lakes College, which provided them with the opportunity to put their learning into action, and the food was well received by all. The evening ended with Tessa Sanderson CBE, Commonwealth and Olympic gold medal winner, giving an inspirational talk about her career and how she coped with competition and rivals.

The next morning, the group visited the National Nuclear Laboratory (NNL), Central Lab, hosted by Dr Dominic Rhodes MBE, NNL Research Fellow and Jen Corbett, Plant Inspection Team. An overview of the company was provided to the group by Paul Howarth, Managing Director, before a tour of the Central Lab by Simon Walker, NNL Phase 2/3 Stakeholder Manager. The two new active labs, which will be used for research and development after being left for several years due to a lack of government support for nuclear, are now in the commissioning phase. The two-day visit concluded with lunch followed by a short tour of the Sellafield site.

Jen Corbett, IMechE West Cumbria



This year's Annual Dinner Guests of Honour with the President



Mark meets Kevin Warren at Dalton Institute at Westlakes Science & Technology Park



The President and IMechE members with their NNL hosts



DEVELOPING YOUNG ENGINEERS

IMECHE WEST CUMBRIA EDUCATION NEWS

NUCLEARGRADUATE BUGGY CHALLENGE

Over four months teams of two or three pupils at Keswick and Beacon Hill high schools have been attending Young Engineering Clubs after school once a week. In the club the pupils have been designing and building mechanical buggies that are able to complete a series of challenges including football, an obstacle course, a bumpy road and a hill climb.

In the junior category, buggies were controlled using an umbilical cord, but in the senior category, the task was made harder with remote control buggies being required.

A team of STEM ambassadors, currently on the

nuclear graduates scheme, organised a 'Challenge Day' with the support of IMechE to test the buggies and award prizes to the best teams. Team Black Adder and Apex were really pleased to win remote control helicopters as the winners in the junior and senior competitions respectively.

Team Jerry won the 'Best in Show' award for designing the highest scoring buggy in terms of aesthetics, quality of build, innovation and using recycled materials - winning solar powered remote controlled robot kits. Additional team building activities were run by the volunteers, including building a bridge from k'nex (with the Institution of Civil Engineers) and racing against another team to use robotic grabber arms to separate blocks (with Sellafield Ltd).

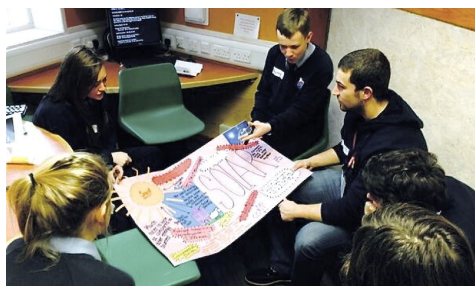


The day was a great success and teams were already looking at the changes they'd make to their buggies for next year's event! Thank you to the volunteers and teachers who supported this event and to IMechE for the funding for the venue and fantastic prizes.

Kimberley Williams
Nucleargraduate & Event Organiser

STEM ACTIVITY DAY

On the 30th March 2014 the IMechE West Cumbria sponsored a STEM day at Cockermouth School organised by a group of Nuclear Graduates. The event was energy themed, with pupils considering the different energy sources available to ensure there is enough electricity for future generations. A similar event sponsored by the IMechE was held in Barrow in 2013 and we were pleased to be able to do the same again.



Sixty year nine pupils attended the day and each was awarded a 'CREST Discovery Passport' to allow them to demonstrate their participation in the event to future employers. The morning consisted of four workshops in which groups of 15 pupils circulated with help from a nuclear graduates 'team buddy'. One workshop involved using balloons to demonstrate nuclear power and the effect of control rods on a nuclear chain reaction. Another explained the carbon cycle through a hands-on activity and investigating the impact of the industrial revolution on atmospheric carbon. Resources provided by the IMechE gave pupils the chance to build hydrogen powered cars; this was combined with an explanation of different renewable energy sources. The final workshop was a 'Million Pound Drop' style quiz covering a range of topics all relating to energy.

During the afternoon pupils were given a challenge designed to combine all the information gained during the morning as well as developing research and presentation skills. In teams of 6, each with a nuclear graduate on hand to assist, pupils were asked to prepare a 2 minute presentation on a specific energy

type. Each group was given a different energy source, for example biomass, coal and wind, on which to focus their research and presentation. The presentations were judged by a panel pretending to represent the environment, local community and local council. To add to the challenge, the time allowed for research was limited, and during preparation the judging panel approached each team to quiz them on their proposal.

All ten teams worked excellently and presentations ranged from brightly coloured posters to a dramatised demonstration of biomass! The presentations were of brilliant quality and the judges struggled to choose a winner. The top three teams were awarded prizes including solar powered kits and remote control helicopters. The event received very positive feedback, with the teacher involved



saying all pupils were 'vocal in their appreciation, having really enjoyed the day'. Cockermouth School have already expressed an interest in working with nuclear graduates and the IMechE again and it hoped a similar event will become an annual occurrence.

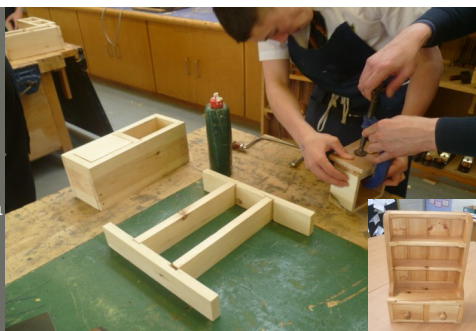
Sarah Morgan, Nucleargraduate
& Event Organiser

IMECHE SPONSORSHIP DESIGN TECH SKILLS PROJECT

Thanks to the generous sponsorship of IMechE West Cumbria, Year 10 Design Technology GCSE students at Stainburn School have been developing their skills by constructing a wall mounted storage system as part of a project designed to enhance the student's capabilities in the manipulation of tools and materials, and their knowledge and understanding of the working properties and characteristics of timber.

The theory, knowledge, skills and processes that the project covered were; how to work safely in a workshop, health and safety consideration and the types of wood. Skills were taught in the use of particular tools, processes and equipment in the workshop for shaping and forming woods, which included; marking out, measuring and cutting, using appropriate wood joints, planing, sawing, routing, drilling, mortising. Further processes taught at the event were the use of jigs and templates as part of a quality control and quality assurance process.

Students were helped to understand properties of particular woods and be able to recognize suitable woods for particular purposes based on their working characteristics: Strength, toughness, durability, flexibility.



During the project the students worked enthusiastically and over a period of time became more skilled and competent in their overall practical capability. The students approached the project with enthusiasm and commitment and worked hard in order to finish the project in the allotted time. They were very pleased with their outcome and took their finished products home.

The staff of Stainburn Design Technology department would like to thank all at the Institution of Mechanical Engineers for making this learning experience possible for the students, and in particular David Williamson without whose co-operation and efforts to secure the funding the project would not have been possible.

Emma Bell & Phil Burns, Design Technology
Department, Stainburn School

EXPLORING OUR ENGINEERING EXCELLENCE

INDUSTRIAL DRYING TECHNOLOGY



LEADERS IN DRYING TECHNOLOGY

On Tuesday 15th April 2014 the Institution of Mechanical Engineers visited Carlisle-based Mitchell Dryers Limited. The Company has specialised in the field of Industrial Drying for over 80 years and offers one of the widest ranges of drying equipment available, with one of the most comprehensive ranges of test facilities in Europe.

The Mitchell Dryers Product Range

Band Dryers - application in drying food, chemicals, mineral and waste products.

Fluid Bed Dryers - inlet air temperatures up to 450°C drying assisted by agitation of the product bed (for foodstuffs; pharmaceuticals; chemicals and minerals).

Roller Extruders - producing granules from a filter cake, such as kaolin (China clay) and pigment, for onward drying most traditionally on band drying technology.

Rotary Dryers - provide a means of continuously handling powders and granules.

Calciners - similar in design to rotary dryers, except that much higher temperatures are involved.

Stoves and Cabinets - tray drying is often the most convenient and economical way to handle small or varied batches of materials.

Thermo Venturi Dryers - for continuous drying/cooling of powders and granules which can be readily dispersed and conveyed in a hot air stream.

Vacuum Dryers - used where materials to be dried are heat sensitive or liable to oxidation.



Conveyor Band Dryer for Breakfast Cereals

Factory Tour

The group were met by Bill Farrer, Technical Sales Director and Mark Newton, Sales Manager and following brief introductions, the Mitchell Team took us through the history of the company and the products they design, manufacture, assemble.



Rotary Dryer

On arriving on the factory floor we were taken to see a single pass band dryer. Drying is effected by circulation of hot air through a bed of material as it is carried through the dryer on a conveyor band. The drying enclosure is divided into a number of drying sections each including an air heater and circulating fan together with fresh air inlet and exhaust facilities. This gives precise temperature control in each zone, reduced installation time and facilitates future extension.

This dryer was being manufactured for an overseas food manufacturer, and is made from 304 stainless steel and heated by natural gas. The design included a high grade finish and a sloped floor for hygiene and ease of cleaning. Drying efficiency on this equipment is maximised by the use of upwards/downwards airflow, double skin insulated panels, effective sealing of the dryer enclosure and even air distribution.

Test Centre

The final part of the tour took us to the test centre which has been in operation since the early 1970's following a relocation from the Greater Manchester Area. Inside this facility are pilot scale units of all the dryers installed to undertake trials on their clients' materials.

The emphasis is on development and they have tested over 3000 different materials to determine optimum drying route and parameters and an enviable database of specialist drying information.

The group were shown around each of the pilot scale units, and this included a demonstration of the band dryer rig.

Simon Mandale, IMechE West Cumbria

COMPANY FACT FILE

- In 1859 John Blaylock and William Pratchett formed Blaylock and Pratchett
- The Iron and Brass Founding firm manufactured railway equipment, steam engines, grinding mills, pumps and church bells
- In 1877 following the death of John Blaylock the company name changed to Pratchett Brothers
- During the 1920's the company became principal contractor to LA Mitchell Group in Manchester
- Through 1930 to 1950 the company continued to manufacture industrial drying equipment
- In 1964 the company took an interest in intensive mixer equipment and its design team relocated from Manchester to Carlisle, with a new test centre built following the take-over by APV - the company becoming known as APV Mitchell Dryers Limited
- In 1994 the company was acquired by the Lodge Group and renamed Mitchell Dryers Limited
- A management buyout in 2004 was effected by the company Directors and control of the company returned to the Carlisle works.

FORTY PEOPLE STRONG

SPECIALISING IN SALES, DESIGN, PROJECTS, TEST CENTRE, ADMINISTRATION, INDUSTRIAL DRYERS AND CALCINERS INTENSIVE MIXERS



EXPANDING LOCAL KNOWLEDGE

CREATEC - INNOVATION IMAGING TECHNOLOGY

Dr Matt Mellor of West Cumbrian research and development company Createc Technologies (Createc) gave a presentation to the IMechE West Cumbria members and guests on Thursday 15th May at the SEN Centre at Lakes College, Workington. The presentation provided some background to Createc's history as well as a number of interesting and novel projects that the company is working on.

Createc began life in 2005 as the research and development function of REACT Engineering Ltd, an engineering consultancy that has been providing services to the civil nuclear industry since 1994. By 2010 the Createc team's activities had grown beyond the civil nuclear sector and, to reflect this change in focus, Createc was formed as a new company, spun out as part of the R3i group.

Createc are firstly unusual as their approach to R&D is not the typical from one technology to one end user. They look to be 'technology matchmaking', taking a number of technologies from concept to prototype, and matching these to a number of applications where they develop

from the prototype to product. In only a few years, Createc have produced the world's most advanced compact radiation imaging system, devised a fundamentally new technique for explosives detection, developed intelligent sensor systems for Unmanned Air Vehicles and invented the highest resolution aerial digital video system available today.

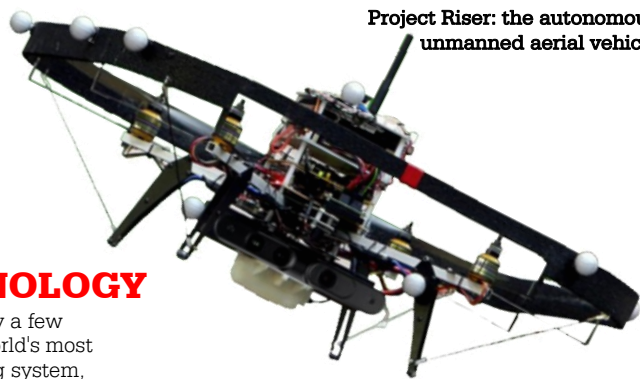
A number of technologies were presented, including RISER (Remote Intelligence Survey Equipment for Radiation) in collaboration with BlueBear. Where the latter brought their unmanned air vehicle and Createc brought their radiation imaging, together they produced a system that is capable of not only being deployed in onerous radiation fields, the onboard system is able to 'think' such that it finds the source terms and moves to / from them in order to gather greater value data. Another application presented developed by Createc was SLATE, an autonomous security device that generates information rather than data, meaning the system can decipher between movement of people, animals and objects, and further between normal walking passers-by and those running erratically or in a 'suspicious

manner' in order to suggest potential IED locations.

Createc take on a mix of publicly funded and commercial R&D on behalf of each customer, finding answers to their imaging and sensing problems and developing technologies to deliver the solutions they need. They have successfully applied imaging and sensing technologies and scientific computing techniques across a range of industries, including the civil nuclear, medical, aerospace, defence and security sectors.

The talk had been organised to advertise the wealth of capability in the West Cumbria area, and the reach such companies have. Createc have been greatly involved in generating a better understanding of the radiation environment at the Fukushima plant with members of Createc and REACT deployed to Japan.

Caroline Hamilton, IMechE West Cumbria



Project Riser: the autonomous
unmanned aerial vehicle

M-SPORT BENTLEY CONTINENTAL GT3

On Thursday 12 June 2014 an audience of 54 attended a fascinating presentation at Lakes College West Cumbria on the Bentley Continental GT3 race car, which was designed, developed and built by M-Sport.

M-Sport is one of West Cumbria's highest profile companies having made their name in rallying with Ford and winning the World Manufacturer's Championship in 2006 and 2007. Since the withdrawal of official backing from Ford, M-Sport have expanded their portfolio providing World Rally Cars to an increased number of private customers, the Fiesta S2000 for WRC-2 and now expanding into circuit racing with the M-Sport Bentley Continental GT3.

Chris Gray, M-Sport's Head of Test Engineering and Chief Race Engineer gave an in-depth presentation on the whole Bentley project from concept all the way through to their maiden victory just weeks before the talk. The vehicle has been developed on behalf of Bentley who currently have a two car team run by M-Sport racing in the Blancpain Endurance Series throughout Europe and a customer car run by Dyson Racing in the Pirelli World Challenge in North America.



A great deal of insight was given into how M-Sport had taken a luxury Grand Tourer and changed it into a race car. Other than the vehicles chassis, the road going Bentley Continental and the GT3 race car are quite



different; and even the roll cage was designed to specifically increase the rigidity of the chassis.

Chris explained how within the GT3 category the vehicles must comply with the FIA homologation; an approval process through which the vehicle is required to go for certification to race. Homologation restricts the manufacturer's choice of engines to those used within the same automotive group. For Bentley this means M-Sport had a choice of any engine from the Volkswagen-Audi Group and they chose their 4.0-litre twin-turbo V8.

The engine has been tuned to develop over 600bhp when unrestricted and drives the rear wheels through a six-speed sequential transaxle gearbox produced by Xtrac. The gearbox is controlled via a steering wheel mounted paddle. The choice of engine has allowed M-Sport to position it towards the rear of the engine bay. This, together with the gearbox being located at the rear of the vehicle, achieves a 52:48 weight distribution. All together the race car has a mass of 1,300kg, which is a reduction of approximately 1,000kg from the Bentley Continental road car.

M-Sport's pedigree has shone through already

despite their previous lack of circuit racing experience. At the first race of the Blancpain Endurance Series the two M-Sport Bentleys finished seventh and eighth with one of the cars having been in second position early in the race. This was followed with back to back wins for the no. 7 M-Sport Bentley at Silverstone and Paul Ricard in the South of France. The Silverstone victory was particularly gratifying not just because it was the home race but this was the first official victory for Bentley at Silverstone in their almost 100 years of history.

Simon Farrell, IMechE West Cumbria



Simon offers his thanks to Chris for his presentation.

IMECHE WEST CUMBRIA UPCOMING EVENTS

Institution of
**MECHANICAL
ENGINEERS**

AUTUMN/WINTER EVENTS PROGRAMME 2014/15

BOOKING IS NOW ESSENTIAL FOR ALL OUR EVENTS

This can be done very simply by visiting:

<http://nearyou.imeche.org/near-you/UK/North-Western/West-Cumbria-Area/events>

Simply select the event you are interested in, click the "Book this event" link and complete the form. Registered emails will be the first to know when future events are available for bookings.



TALK: Vehicle Collision Investigation

This talk by Simon Farrell will highlight his work for GBB (UK) Ltd of Burnley, Lancashire. GBB are a market leading firm of forensic collision investigators and engineers, who offer advice and expert evidence in all motoring matters particularly collision reconstruction and investigation. The talk will discuss how a wide range of different collisions are investigated, from minor scrapes to those involving major injuries or fatalities.

Location: Hunday Manor Hotel, Winscales, Workington, CA14 4JF

Organiser: Simon Farrell on simonf81@yahoo.co.uk

WEDNESDAY

10

TALK: 19:00
Registration: 18:30

SEPTEMBER



VISIT: TIS Cumbria Limited

LIMITED PLACES AVAILABLE

An opportunity to visit TIS Cumbria Limited's brand new facilities at Derwent Howe Workington. TIS are one of West Cumbria's leading fabrication, welding and NDT specialists capable of taking concepts from design, through to production, installation and inspection, servicing the Nuclear, Industrial Process and Petrochemical, Oil and Gas sectors across the globe. This visit takes place during the day to enable guests to see the facility in operation.

Location: Unit 5a, Dewent Drive, Workington, CA14 3YW

Organiser: Caroline Hamilton on c_m_lamb@hotmail.com

FRIDAY

17

SITE VISIT
From 13:00 - 15:00

OCTOBER



TALK: Construction of Devonshire Dock Shipbuilding Facility

The Shiplift and the Shipbuilding Hall were the largest such structures in the world and represent a radical departure from traditional shipbuilding methods. The talk will deal with the construction of the shipbuilding facility in the light of its huge importance to the economy of the area and the UK governments intended investment in it.

Location: Energus, Blackwood Road, Lillyhall, CA14 4JW

Organiser: Tom Pritt on tom.pritt@jacobs.com



TUESDAY

18

TALK: 19:00
Registration: 18:30

NOVEMBER



Education Extravaganza!

ImechE West Cumbria are running and supporting STEM Educational Activities in West Cumbria:

Engineering Awareness Day: St. Benedicts School on Saturday 15th November, from 9am

Engineering Your Future: Samuel Lindow Building, Westlakes on Friday 21st November, from 9am

If you are a STEM Ambassador and want to get involved, contact:

Matt Cleaver on 019467 84731 or WCumbEducation@imechenetwork.org

NOVEMBER



TALK: Solway Energy Gateway Project Update

A talk to give an update on progress to date with the design and development of the Solway Energy Gateway Project (SEGP) by Nigel Catterson, Chairman at SEGP. The SEGP the proposed scheme to construct of a tidal energy generating alignment between Bowness on Solway and Seafield, Annan, at the point where a viaduct once spanned the Firth.

Location: The SEN Centre, Lakes College West Cumbria, CA14 4JN

Organiser: David Williamson on david.j.williamson@sellafieldsites.com

THURSDAY

15

TALK: 19:00
Registration: 18:30

JANUARY



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IMPROVING
THE WORLD
THROUGH
ENGINEERING

For more information about our upcoming events, visit our area's website: www.imechewestcumbria.org.uk/events.html
Remember, you don't need to be a member of the Institution to take advantage of our events.
Simply **book your place online** using our Event Booking Registration system. Anyone of all ages can come along!

Don't forget to sign up to receive our regular email updates. Simply forward your email to: WCumbSec@imechenetwork.org