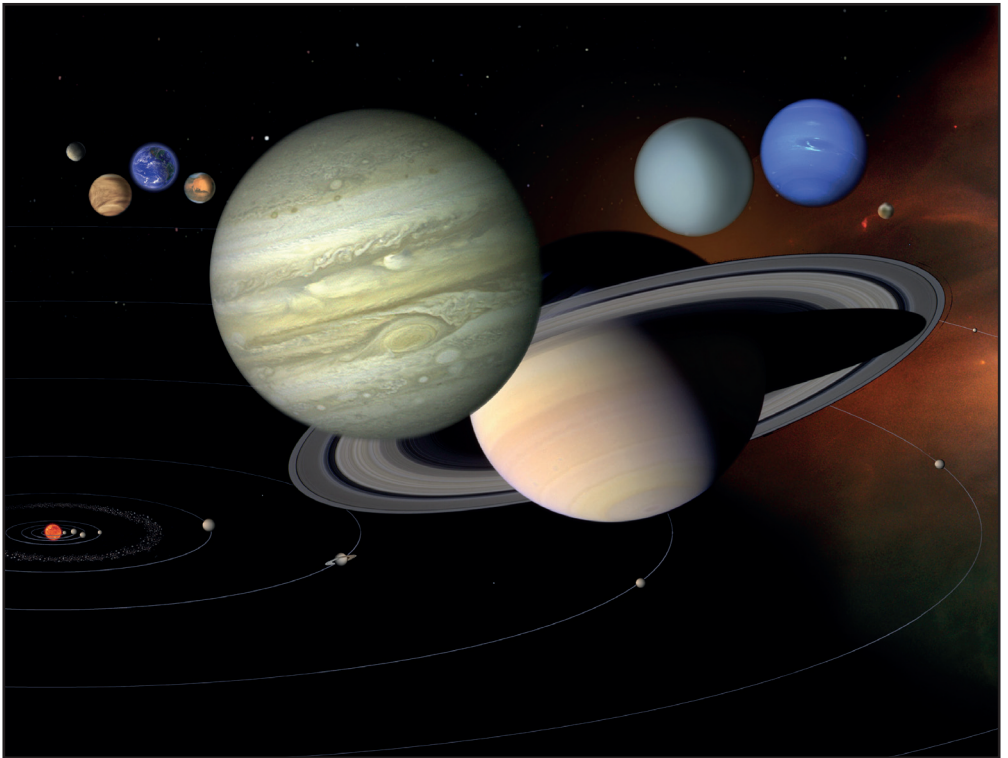




The Institution of
Engineering and Technology

Lancashire and
Cumbria Network

Newsletter Vol. 8 No. 1
September 2011



Professional Home for Life for Engineers and Technicians

www.theiet.org/lancscumbria

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Cover picture

NASA is the source of the cover picture.

CHAIRMAN'S INTRODUCTION

“ Welcome to this session. I hope that you find that we have an interesting programme of events covering a wide area of our Network.

Please look at the website as there may be additional events that will be notified by e-mail and shown on the website. I hope that you have found the previous newsletters to your satisfaction and that we keep you informed about the Local Network. If you have any comments please do not hesitate to contact me at mbell@theiet.org or on **07870 666917**.

”

The Editor

Next Issue

The next issue of the IET Lancashire and Cumbria Network newsletter will come out in January 2012.

Please send copy to the editor at mbell@theiet.org by 1 December 2011.

“ It has been recognised by the IET Headquarters that the Lancashire & Cumbria Network continue to be successful in attracting good attendances, both members and non members, at the events we promote and we have been encouraged to continue to develop our programme in a similar way.

The IET is promoting five Technical Sectors covering Built Environment, Design & Production, Energy, Information & Communications and Transport. From this we are looking within the Energy Sector for the Networks Theme for the year.

The Government has been set a series of targets by the European Union known as 202020 – we have to reduce our energy consumption by 20% and generate 20% of our needs using sustainable resources by 2020.

These are tough targets indeed and there's only 9 years left to develop solutions and deploy them. The country will be relying on the ingenuity of our Engineers to provide the solutions we will need to meet the challenges we face – the next few years will present many opportunities for the profession to show just how valuable we are. Many of the solutions are being developed here in the North West and it's appropriate that having led the world in the Industrial Revolution of the 19th Century, we will be leading the Sustainable Revolution in the 21st Century through the universities and industries in our region.

The theme chosen for this year is 'Sustainable Engineering' and we'll be hearing from experts in the field of clean energy generation and energy conservation. We will also be covering subjects that always prove popular in subjects ranging from space exploration to trams.

I hope you will enjoy the programme we've arranged and you find it both interesting and informative.

”

John Cowburn CEng FIET - Chairman

Disclaimer The IET Lancashire and Cumbria Network arranges lectures, site visits and other events of professional and general interest to members and their guests. In doing so the IET endorses neither the opinions of speakers nor products and services supplied by them or by their companies.

Registration for Events

The Network used the Plus! For Events online registration system to collect pre-registration details for some of the events that were held in the last session. This enables members and non-members to register for events. The network has used it previously for visit registration and it has worked well. There is no need to register for the event but it will help in organizing the event if you do. You can still attend the event without registering. For events which have a meal after the event then it is important to ensure that the booking form is returned to the organizer.

This system has been introduced to help Networks extend their reach and increase their audiences. The online registration system also makes life easier for the Network by:

- Collecting metrics information automatically
- Producing sign-in sheets quickly and easily
- Gathering feedback from attendees after an event

As a result of networks using the online registration system the Network will be able to send emails to non-members as well as members to alert them to Local Network events that are happening in their area. When a non-member registers their interest in attending a Local Network event using the online registration system we get their agreement and their details are stored. Staff are then able to add them to the circulation list for every promotional email that goes out on behalf of the Network in the future.

Important Notice

The Network is looking at ways to reduce its expenditure on the Newsletter. If you have any comments or ideas on ways that we can reduce the costs of the newsletter then please let me know at mbell@theiet.org.

To help all to get information on the Network events we will be supporting both a LinkedIn group and Twitter – see below.

Get LinkedIn to the IET Lancashire & Cumbria Local Network

Come and Join Us on our new LinkedIn Group for the IET Lancashire & Cumbria Local Network. Our group is not just for members but is for all people with an interest in the IET Lancashire & Cumbria LN activities:

- Keep informed of local IET activities in the Lancashire & Cumbria LN.
- Network with other IET members in the region.
- Discuss Engineering and Technology related local topics.
- Find out more about the IET and its local activities.
- Tell us what you think about our local activities!

To join use this link - <http://www.linkedin.com/groups?gid=2179430>

The LinkedIn Group is open to both IET members and non-members. You may need to join LinkedIn (which is completely free) if you are not already registered.

Follow Us on Twitter!

You can now follow the IET Lancs & Cumbria on Twitter - <http://twitter.com/ietlancscumbria>

Become more involved with the local IET Community by joining us

Would you like to meet up with fellow-engineers from other organisations?

Do you want to expand your own skills while contributing something to your profession?

Are you interested in attracting the next generation of engineers?

What ideas do you have for your local IET community?

However you want to become involved, e-mail me, Mike Bell mbell@theiet.org to express an interest. You do not need lots of spare time – many of our committee are busy people. The area of involvement and the amount of time you spend is up to you though we will have specific needs in the following areas over the coming year

- Liaison with University students and staff
- Joining and being involved with the local committee
- Publicising events to local IET members and the wider community
- Arranging visits or events
- Liaison with other professional institutions
- Recruitment of new members to the IET

Helping in these areas would be an excellent way of extending your network of contacts within the professional engineering arena, or simply expanding your personal horizons. Not all of them would need you to attend committee meetings; we meet around 4 or 5 times each year. Take on a much responsibility as you wish; it is your choice.

IET members, men and women, of all ages and grades are welcome. We always encourage 'new blood' to refresh our Network and the widest possible range of people will help us to maximise our relevance in Lancashire & Cumbria.

Email me now at mbell@theiet.org without any obligation telling me where your interest lies. If you wish, send me your telephone number and preferred time if you want to discuss matters on the phone. Alternatively, we could meet at one of our events.

Thanks, and I hope you'll consider joining us as active volunteers. You will be surprised how the amount of effort you put into helping the IET is returned magnified in a variety of other life enhancing ways.

If you wish to get involved please contact the Network Secretary, Mike Bell, mbell@theiet.org, tel: **07870 666917**.



Engineering Support for Life

IET Connect has a range of services for IET members and their dependants.

We can refer you to a free legal helpline for personal, family and employment concerns.

If you are struggling to meet an unexpected cost, or going through a difficult patch financially, we may also be able to give short term financial assistance. If debts are getting out of hand, we can refer you to independent money advice to help to get back in control.

IET Connect can also assist with a wide range of care costs such as respite to give carers a break, independence and help at home right through to care home fee top up.

For members in need of employment support we offer access to Outplacement Service giving individual guidance through face-to-face sessions as well as online tools to help increase chances of finding suitable employment.

We also offer specialist advice on State benefits and funding and can put you in touch with a wide range of specialist organizations for help with a particular situation.

If you are facing a difficulty, financially or otherwise, then the earlier you contact us the better. Please do get in touch.

For more information on services and funding please contact the IET Connect helpline on **0845 685 0685** or email **ietconnect@theiet.org**

Alternatively you can contact IET Connect's Local Representative Dr Peter Roberts FIET on **0771 8058299** or email **pe.roberts@theiet.org**

Become a Mentor with the IET Mentoring Service

Demand for mentors is growing fast. The IET need new mentors throughout the UK to meet demand.

Could you spare one or two hours a month? Would you like to share your knowledge and experience to the benefit of others? If yes, read on!

If you or anyone you know might be interested in this exciting opportunity to encourage, support and guide other engineers at key stages within their careers we would be pleased to hear from you.

90% of members applying for a mentor through the Mentoring Service are hoping to achieve Professional Registration (CEng, IEng, EngTech, ICTTech). If you are CEng, IEng, EngTech or ICTTech registered and would like to support other members towards achieving Professional Registration, contact us today. Full training and support will be provided. For further information contact us at:

Web: www.theiet.org/mentoring

Email: mentoring@theiet.org

Tel: 01438 767647

Forthcoming Events

For latest news on local network activities go to www.theiet.org/lancscumbria. It is hoped to run some additional visits and lectures during the year. These will be shown on the website and there will be notification by e-mail. Details of other Institutions events will also be shown on the website.

The Formation and Evolution of Our Solar System

Date: Tuesday 20th September 2011
Time: 6.00pm for 6.30pm
Speaker: Robin Catchpole
Venue: Swallow Hotel, Preston New Road, Samlesbury, Preston, PR5 0UL
Contact: Jim Hindle
01282 771355
jim.hindle@btinternet.com

Date: Wednesday 21st September 2011
Time: 7.00pm for 7.30pm
Speaker: Robin Catchpole
Venue: Forum 28, Duke Street, Barrow,
Organised by: Joint with PESC LA14 1HH
Contact: Ralph Hobson
01229 583762
ralph@thehobsons.co.uk

Our Sun and planets, along with other stars, were born out of a cloud of mainly hydrogen and helium, which collapsed under its own gravity 4500 million years ago. The collapse may have been triggered by the explosion of a nearby supernova. Clues to our history can be found by studying isotopes in Earth rocks, the Solar wind and meteorites. Our Solar System is about half way through its life and already showing signs of old age as the rate of rotation of Mercury slows down. In this lecture we will see what we know about the past, present and future of our Solar System.

Dr Robin Catchpole

Dr Robin Catchpole, recently retired as Senior Astronomer at the Royal Observatory Greenwich, currently works at the Institute of Astronomy, Cambridge, and has been an astronomer all his life. He has authored and co-authored over 100 research papers and used a number of telescopes around the world including the Hubble Space Telescope. His research interests include the composition of stars, exploding stars, the structure of our Galaxy and galaxies with black holes at their centres. He has given many lectures and radio and TV interviews.

Roll-Out of Smart Meters in the UK – Chairman’s Address

Date: Wednesday 12th October 2011
Time: 6.00pm for 6.30pm
Speaker: John Cowburn
Venue: Swallow Hotel, Preston New Road, Samlesbury, Preston, PR5 0UL
Contact: Jim Hindle
01282 771355
jim.hindle@btinternet.com

The government has been given targets by the European Union in common with countries throughout Europe to reduce the amount of energy used and carbon emitted into the atmosphere. The 2020 targets require that we use 20% less energy, emit 20% less CO2 and generate 20% of our energy through sustainable means by 2020. The European Energy End Use directive also calls for consumers to have better information regarding their energy usage in order for them to make informed choices. Two European Mandates have been issued calling for standards in smart metering communications and for smart grid standardisation.

With these and other reasons, the UK government has decided that a roll out of smart metering will commence in 2014 with every home in the country upgraded by 2020.

This talk will cover the technology behind smart metering, what it will offer and the benefits that can be expected.

Robin Rigg Windfarm, Visit & Lecture

Date: Wednesday 12th October 2011
Time: 7.00pm for 7.30pm
Speaker: Sally Shenton
Venue: Robin Rigg Operations Facility, Prince of Wales Dock, Port of Workington, Northside, Workington CA14 1BN
Contact: Ugo Ubochi
0791 771 5726

Robin Rigg is the first offshore wind farm in Scotland and one of the largest in UK waters. With a maximum output of 180MW it provides in an average year enough power for the equipment of 117,000 homes.

Operated from a base at the Port of Workington the locally based team undertake repairs and maintenance with a need to take into account weather conditions as the turbines are accessed by boat.

The visit to the on-shore operations and maintenance facility will allow an insight into how the wind farm works, the challenges in operating and maintaining it and a chance to see how the site was constructed.

There will be a presentation by the site manager, a chance to see the construction film and a tour of the facility's control room.

Reservation is important for this event. To confirm a place at the event please register either direct to

<http://localevents.theiet.org/register.php?event=cfe38c>

or via the IET Website,

www.theiet.org/lancscumbria

and book a place.

Titanic

Joint with Blackburn Engineers

Date: Thursday 14th October 2011
Time: 6.30pm for 7.00pm
Speaker: Nigel Hampson, Chairman, Titanic in Lancashire Project
Venue: Whitehall Country Hotel, Darwen, BB3 2JU
Organised by: Joint with Blackburn Engineers
Contact: Jim Hindle
20 Cowley Crescent, Padiham, Lancs, BB12 8SX
01282 771355

The Titanic in Lancashire project is dedicated to ensuring the people of Lancashire who were caught up in the Titanic disaster are never forgotten.

As most Titanic enthusiasts will know, Colne in East Lancashire is the home town of Titanic's bandmaster Wallace Hartley and the place where he was interred after the sinking. A beautiful bronze bust was erected after the disaster to commemorate his heroic actions.

The building of the Titanic marked the construction of the largest man-made movable object in the world at that time, with an overall length of 882 feet and a gross tonnage of 45,000 tons.

The power plant consisted of two 15,000hp triple expansion reciprocating engines turning at a maximum speed of 75rpm and a steam turbine, using the exhaust steam from the main engines to drive a central propeller.

The main electrical plant for the generation of light and power was provided by four 400KW engines and dynamos. Each engine had an output of 4,000 amps at 100 volts.

The lecture will outline the contribution made by the victim's of the Titanic disaster into the White Star Line's flagship voyage.

Dinner is at 7.00 p.m. and will be followed by the talk; it is possible to attend the talk, which will start at approx 9.00pm without the meal if desired. Booking for the meal is essential. The cost of the meal is £20.00 each. Bookings to Jim Hindle, 20 Cowley Crescent, Padiham, Lancs. BB12 8SX, 01282 771355 using the flyer enclosed.

Roll-Out of Smart Meters in the UK – Chairman’s Address

Date: Wednesday 19th October 2011
Time: 7.00pm for 7.30pm
Speaker: John Cowburn
Venue: Crooklands Hotel, Kendal
Contact: Richard Harrison
01524 733898
rharrison@btinternet.com

The government has been given targets by the European Union in common with countries throughout Europe to reduce the amount of energy used and carbon emitted into the atmosphere. The 2020 targets require that we use 20% less energy, emit 20% less CO2 and generate 20% of our energy through sustainable means by 2020. The European Energy End Use directive also calls for consumers to have better information regarding their energy usage in order for them to make informed choices. Two European Mandates have been issued calling for standards in smart metering communications and for smart grid standardisation.

With these and other reasons, the UK government has decided that a roll out of smart metering will commence in 2014 with every home in the country upgraded by 2020.

This talk will cover the technology behind smart metering, what it will offer and the benefits that can be expected.

The Big Ditch – the Construction of the Manchester Ship Canal

Date: Thursday 20th October 2011
Time: 10.30am for 11.00am
Speaker: Glen Atkinson
Venue: The Hydro Hotel, Helm Road, Bowness-on-Windermere, LA23 3BA

Applications: David Pitts
Ryelands, 4 Bannisdale, Cowan Head, Kendal LA9 4LA
Contact: Any queries before 9th October to Doug Howe 01772 743948 and then after the 9th to David Pitts 01539 735525

Manchester is unlikely to have become the City it is today without the 36-mile long link to the sea that the Canal provides. The idea to establish a link was first proposed in 1660 but it was a couple of centuries later, with the growth of the textile trade, that direct access to the sea for the import and export of manufactured goods became vital.

Glen will tell us about the huge construction project and show us some of the problems encountered. His pictures are all taken from original lantern slides.

The Canal, now privately owned by Peel Ports, looks towards increasing redevelopment and expansion as part of the recently announced £50 Billion Atlantic Gateway project.

The Hydro Hotel is another new venue for us, with views over Windermere and Bowness. Parking and disabled facilities are available.

A cup of tea/coffee will be available on arrival from 10.30 am and the talk will commence at 11.00 am. This will be followed by an optional 3-course lunch, costing £17. All members, their partners and guests, are very welcome. Please advise of any special dietary needs.

Please send all applications on the enclosed flyer, whether staying for lunch or not, before 14th October to David Pitts, Ryelands, 4 Bannisdale, Cowan Head, Kendal LA9 4LA

Applications will be confirmed by post or email and full directions given to The Hydro Hotel.

Annual Northern Aerospace Forum

Date: Thursday 20th October 2011
Time: 1.30pm till late
Venue: Dunkenhagh Hotel, Blackburn (close to Junction 7 of the M65)
Organised by: ANAF (RAeS, I Mech E, IET & NWAAs)
Contact: Bill James
billjames2@ntlworld.com

“Should further integration of the Aerospace Supply Chain – including the customers - take place in the light of the pressures now affecting the industry?”

Speakers at ANAF 2011 stressed the importance of Companies at all Tiers in the supply chain working together. This is one of the thrusts of the North West Aerospace Alliance ASCE programme. However, can lessons be learned from other industries, e.g. Automotive, Nuclear, and Formula 1. In addition there may well be downsides; if companies in a (for example) Northern UK supply chain to the major UK Primes wished to bid for work for e.g. Bombardier, what are the issues. The role of the Customer in this extended Supply Chain is also of key importance.

ANAF 2011 will consist of:

- Talks by a number of Speakers on the topic;
- A Forum of Senior Aerospace figures, including the Speakers, to discuss and debate the issues raised in the Talks;
- And, finally, a Dinner at which one of the speakers will sum up the outcome of the day.

The Speakers and Forum Members will include the following:

- Graham Chisnall (ADS, MD AeroSpace and Operations);
- Steve Crawford (Airbus in the UK, Head of Supply and Support);
- Simon Jewell (Managing Director, Strategic Capability Solutions, BAE Systems plc);
- Dr Mark Johnson (Senior Research Fellow, Supply Chain Research Centre, Cranfield School Of Management);
- Andrew Manahan (Cosworth Engineering, Head of Aerospace and Defence);
- David Nutton (CEO, RLC Engineering Group)
- AVM Julian Young (RAF, Chief Engineer (Air), HQ Air Command).

The Forum will be facilitated by Graham Roe, who has performed this role at the previous ANAFs.

The cost for attending the Talks and Forum only is £10, for the Talks, Forum and Dinner it is £60. A Corporate Table for 10 is £500.

Words Across the Ocean – From Cable to Satellite

Date: Wednesday 26th October 2011
Time: 7.00pm for 7.30pm
Speaker: Prof Nigel Linge
Salford University
Venue: Forum 28 ,Duke Street, Barrow, LA14 1HH
Organised by: Joint with PESC
Contact: Ralph Hobson
01229 583762
ralph@thehobsons.co.uk

In 1857 the first attempt was made to link up the electric telegraph networks of the UK and USA. This necessitated the huge undertaking of both manufacturing a copper communications cable capable of spanning the Atlantic Ocean and then successfully laying it. Using two ships, the Victorian engineers eventually achieved their goal in August 1858 but with short lived success. However, the Atlantic had been conquered and with a further successful mission in 1866 the continents of North America and Europe have remained connected by a communications link to this day. In this lecture Professor Linge will tell the story of these gallant missions, how the cable was made and the technical challenges of sending electrical signals over thousands of miles. He will go on to show how the Atlantic Cable was a catalyst to wiring up the world and how today’s Internet relies on fibre optical cables lying at the bottom of the world’s oceans following virtually the same paths as those used by the telegraph pioneers.

Nigel Linge is Professor of Telecommunications at the University of Salford where he is Head of the Computer Networking and Telecommunications Research Centre and undertakes research into computer networking, communication protocols, location based information systems and applications of sensor networks. He has a keen interest in the history of telecommunications and chairs the Connected Earth Consulting Group that advises BT on their Heritage Strategy. He is a Fellow of the IET and a former Chairman of the Manchester Network.



The Institution of
Engineering and Technology

Lancashire and Cumbria Network Events: September – December 2011

www.theiet.org/lancscumbria

TUESDAY, 20 SEPTEMBER 2011, SWALLOW HOTEL, SAMLESBURY, 6.00 FOR 6.30 P.M.

FORMATION OF THE SOLAR SYSTEM

Robin Catchpole

Talk at Swallow Hotel, Preston New Rd., Samlesbury, Preston, PR5 0UL
Contact Jim Hindle, 20 Cowley Crescent, Padiham, Lancs.
BB12 8SX, **01282 771355**

WEDNESDAY, 21 SEPTEMBER 2011, BARROW, 7.00 FOR 7.30 P.M.

FORMATION OF THE SOLAR SYSTEM

Robin Catchpole

Joint with PESC / CMI / IMechE
Talk at Forum 28 ,Duke Street, Barrow, LA14 1HH
Contact Ralph Hobson: **01229 583762, ralph@thehobsons.co.uk**

WEDNESDAY, 28 SEPTEMBER 2011, DEWLAY, GARSTANG

VISIT TO DEWLAY CHEESE WIND TURBINE

Evening visit - see website for confirmed time
Contact Rich Grant rgrant@theiet.org

WEDNESDAY, 12 OCTOBER 2011, SWALLOW HOTEL, SAMLESBURY, 6.00 FOR 6.30 P.M.

ROLL-OUT OF SMART METERS IN THE UK – CHAIRMAN'S ADDRESS

John Cowburn

Talk at Swallow Hotel, Preston New Rd., Samlesbury, Preston, PR5 0UL
Contact Jim Hindle, 20 Cowley Crescent, Padiham, Lancs.
BB12 8SX, **01282 771355**

WEDNESDAY, 12 OCTOBER 2011, WORKINGTON 7.00 FOR 7.30P.M.

ROBIN RIGG WINDFARM

Talk and Visit at Robin Rigg Operating Facility, Prince of Wales Dock,
Port of Workington, Northside, Workington, CA14 1BN
Contact Ugo Ubochi: **0791 771 5726, ugosweetin@yahoo.com**

THURSDAY 13 OCTOBER 2011, WHITEHALL COUNTRY CLUB 6.30 FOR 7.00 P.M.

TITANIC

Nigel Hampson, Chairman, Titanic in Lancashire Project

Joint with BES

Dinner and Talk at Whitehall Country Hotel, Darwen, BB3 2JU
Contact Jim Hindle, 20 Cowley Crescent, Padiham, Lancs.
BB12 8SX, **01282 771355**

WEDNESDAY 19 OCTOBER 2011, CROOKLANDS HOTEL, KENDAL 7.00 FOR 7.30 P.M.

ROLL-OUT OF SMART METERS IN THE UK – CHAIRMAN'S ADDRESS

John Cowburn

Joint with K&DES

Talk at Crooklands Hotel, Nr Kendal, LA7 7NW
Contact Richard Harrison: **01524 733898, rharrison@globalmet.co.uk**

THURSDAY 20 OCTOBER 2011, THE HYDRO HOTEL, BOWNESS-ON-WINDERMERE, 10.30 FOR 11.00 A.M.

THE BIG DITCH – THE CONSTRUCTION OF THE MANCHESTER SHIP CANAL

Glen Atkinson

Talk and Dinner at The Hydro Hotel, Helm Road,
Bowness-on-Windermere, LA23 3BA

Contact: Any queries before 9th October to Doug Howe tel: **01772 743948** and
then after the 9th to David Pitts tel: **01539 735525**

THURSDAY 20 OCTOBER 2011, DUNKENHALGH HOTEL, BLACKBURN 1.30P.M.

ANNUAL NORTHERN AEROSPACE FORUM

Presentations, Forum Discussion and Dinner at Dunkenhalgh Hotel,
Blackburn BB5 5JP (close to Junction 7 of the M65)
Contact Bill James: billjames2@ntiworld.com

WEDNESDAY, 26 OCTOBER 2011, BARROW, 7.00 FOR 7.30 P.M.

WORDS ACROSS THE OCEAN – FROM CABLE TO SATELLITE

Prof Nigel Linge, Salford University

Joint with PESC

Talk at Forum 28 ,Duke Street, Barrow, LA14 1HH
Contact Ralph Hobson: **01229 583762, ralph@thehobsons.co.uk**

WEDNESDAY, 2 NOVEMBER 2011 BAE SYSTEMS, WARTON, 7.00 FOR 7.30 P.M.

OPTIMISING THE ELECTRONIC WARFARE TEST AND EVALUATION PROCESS

Mike Pywell and Mitch Midgley-Davies, Electromagnetic Engineering Dept, BAE Systems
Talk at Main Gate Lecture Theatre, BAE Systems, Warton Aerodrome, Preston,
Lancashire, PR4 1AX
Contact Mike Monk: **07801 715085, Michael.Monk@baesystems.com**

THURSDAY, 3 NOVEMBER 2011, THE BEACON, WHITEHAVEN

MEMBERSHIP CLINIC

At The Beacon, West Strand, Whitehaven, CA28 7LY
Contact Rob Griffiths: **07734 343040, rob.i.griffiths@sealfieldsites.com**

WEDNESDAY 9 NOVEMBER, WORKINGTON, 7.00 FOR 7.30P.M.

ENIGMA

Dr Paul Judkins

Talk at UClan Westlakes Campus, Samuel Lindow Building,
Westlakes Science Park, Whitehaven, Cumbria CA24 3JY
Contact Darren Johnston: **07843271224, dsjohnston@theiet.org**

WEDNESDAY 16 NOVEMBER 2011 SWALLOW HOTEL, SAMLESBURY, 7.00 FOR 7.30 P.M.

MICRO CHP

Rob Green, EA Technology

Talk at Swallow Hotel, Preston New Rd., Samlesbury, Preston, PR5 0UL
Contact Jim Hindle, 20 Cowley Crescent, Padiham, Lancs.
BB12 8SX, **01282 771355**

THURSDAY 17 NOVEMBER, WHITEHALL COUNTRY CLUB 6.30 FOR 7.00 P.M.

AIR ACCIDENT INVESTIGATION

Nick Waterspoon

Dinner and Talk at Whitehall Country Hotel, Darwen, BB3 2JU
Contact Jim Hindle, 20 Cowley Crescent, Padiham, Lancs.
BB12 8SX, **01282 771355**

WEDNESDAY 7 DECEMBER 2011, GRANGE OVER SANDS, 10.30 FOR 11.00 A.M.

MANAGING OUR MOTORWAYS

David Pilsworth, Highways Agency

Talk and Lunch at the Netherwood Hotel, Grange over Sands, LA11 6ET
Contact George Heaton, Garth Cottage, Yealand Road, Yealand Conyers, Carnforth
LA5 9SG Tel: **01524 736554**

Full details and event synopses are given in the newsletter
and online at www.theiet.org/lancscumbria.
Maps and directions can also be found online.

The events are open to all with all talks being free unless otherwise
stated Programme Secretary: Barry Lewthwaite: 01539 733767

jblewthwaite@theiet.org

Optimising the Electronic Warfare Test and Evaluation Process

Date: Wednesday 2nd November 2011
Time: 7.00pm for 7.30pm
Speaker: Mike Pywell and Mitch Midgley-Davies, Electromagnetic Engineering Dept, BAE Systems
Venue: BAE Systems, Warton Aerodrome, Warton, Lancashire PR4 1AX
Contact: Mike Monk
07801 715085
Michael.Monk@baesystems.com

A lecture on this challenging area of the survivability discipline, with focus on technical and risk reduction benefits of testing in anechoic chambers and laboratories. Significant developments to date and challenges that lie ahead will be discussed. An overview of the upcoming update to NATO's EW T&E handbook will also be provided.

Reservation is important for this event. To confirm a place at the event please register either direct to

<http://localevents.theiet.org/register.php?event=72317a>

or via the IET Website,

www.theiet.org/lancscumbria

and book a place.

Membership Clinic

Date: Thursday 3rd November 2011
Time: 4.00pm to 8.00pm
Venue: The Beacon, West Strand, Whitehaven, Cumbria CA28 7LY
Contact: Rob Griffiths
019467 80241
rob.i.griffiths@sellafieldsites.com

Professional registration demonstrates your commitment to professionalism and recognises your skills and experience. There are four types of registration:

Chartered Engineer (CEng)

Incorporated Engineer (IEng)

Engineering Technician (EngTech)

ICT Technician (ICT Tech).

This workshop will give members and non-members the opportunity to have an individual appointment with an adviser to discuss professional registration.

To book send an email to getregistered@theiet.org with the heading "Whitehaven – 3 Nov" in the subject line, with level of registration you are seeking (CEng, IEng, EngTech, ICTTech), together with your contact number, membership number (if applicable) and approximate time for your appointment.

Enigma

Date: Wednesday 9th November 2011
Time: 7.00pm for 7.30pm
Speaker: Dr Paul Judkins
Venue: UCLan Westlakes Campus, Samuel Lindow Building, Westlakes Science and Technology Park, Whitehaven, CA24 3JY
Contact: Darren Johnston
07843 271224
dsjohnston@theiet.org

If you have never seen an Enigma machine, then one will be on display at this talk. The presentation will discuss how Enigma enciphered messages, and trace the history of the Enigma machine, showing how Polish, French and British code-breakers successively tackled this German technology, and how the battle of wits between code-makers and such code-breakers as Alan Turing at Bletchley Park developed throughout the war – with some surprising and illuminating sidelights on such devices as the 'Bombe' and 'Colossus'.

Reservation is important for this event. To confirm a place at the event please register either direct to

<http://localevents.theiet.org/register.php?event=0a445a>

or via the IET Website,

www.theiet.org/lancscumbria

and book a place.

The Network would like to record their thanks to the following organisations for sponsoring events via donated facilities.

The
Samuel Lindow
Foundation



Micro CHP

Date: Wednesday 16th November 2011
Time: 6.00pm for 6.30pm
Speaker: Rob Green, EA Technology
Venue: Swallow Hotel, Preston New Rd, Samlesbury, Preston, PR5 0UL
Contact: Jim Hindle
01282 771355
jim.hindle@btinternet.com

In most centralized electricity generating stations, much of the energy input is rejected to the atmosphere as low grade heat. Combined Heat and Power (CHP) allows this low grade heat to be recovered and used for such applications as industrial process heat and space heating, thus raising the efficiency of the overall process. CHP has been used in large scale applications for many years. However, it is only recently that small scale systems, suitable for use in individual dwellings – co called micro CHP – have become available.

Mr Green will describe recent advances in both engine based and fuel cell based micro CHP units, and will discuss their advantages in terms of reductions in both energy bills and carbon emissions.

Robert Green is a Principal Consultant with EA Technology Limited. He has many years of experience in Research and Development of energy systems, including running field trials of micro CHP systems for both the Carbon Trust and major Energy Suppliers.

Air Accident Investigation

Date: Thursday 17th November 2011
Time: 6.00pm for 7.00pm
Speaker: Nick Wotherspoon, Lancashire Aircraft Investigation Team
Venue: Whitehall Country Hotel, Darwen, BB3 2JU
Organised by: Joint with BES
Contact: Jim Hindle, 20 Cowley Crescent, Padiham, Lancs. BB12 8SX 01282 771355

The talk is by Nick Wotherspoon, who will tell us about some of the Air Crash Sites in our area. He will also tell us what is known for the reason of the crash and if possible, some information of the people involved in the accident.

Dinner is at 7.00 p.m. and will be followed by the talk; it is possible to attend the talk, which will start at approx 9.00pm without the meal if desired. Booking for the meal is essential. The cost of the meal is £20.00 each. Bookings to Jim Hindle, 20 Cowley Crescent, Padiham, Lancs. BB12 8SX, 01282 771355. using the flyer enclosed.

Managing our Motorways

Date: Wednesday 7th December 2011
Time: 10.30am for 11.00am
Speaker: Matt Sweeting and David Pilsworth of The Highways Agency
Venue: Netherwood Hotel, Grange over Sands, LA11 6ET
Contact: George Heaton, Garth Cottage, Yealand Road, Yealand Conyers, Carnforth LA5 9SG 01524 736554

Many of us take almost daily advantage of our National Motorway network though most of us will have experienced delays and frustrations at times. The motorway network in the North West of England has many complexities and difficulties so the task of keeping the traffic flowing is not easy.

Our speakers from the Highways Agency will tell and show us of the many difficulties they face with managing the highways under all traffic and weather conditions, planned and emergency. Also about the increasing use of the latest technology, safety improvements, and their plans to improve the motorway capacity by the greater usage of the hard shoulders for peak traffic. They should be absorbing talks.

Prior booking is essential, even if you are only coming to the talk, as space is limited and The Netherwood Hotel is always a very popular venue.

Parking, and disabled facilities are available. A cup of tea/coffee will be available on arrival from 10.30am and the talk will commence at 11.00am. This will be followed by an optional 3-course seasonal lunch, costing £21. All members, their partners and guests, are very welcome.

Please send all applications on the enclosed flyer before November 28th to George Heaton, Garth Cottage, Yealand Road, Yealand Conyers, Carnforth LA5 9SG.

REPORTS

Gravity & the elusive Axion

Professor Robin Tucker

9th February 2011

As a mere engineer, I could understand the initial lines of Prof Robin Tucker's talk on gravity. It was about the Leiden Jar which held electric charge and led to the development of the capacitor. The electric field is contained within the plates of the capacitor. Similarly electro-magnetic fields can be measured and expressed mathematically and lead on to Maxwell's Laws. Together with Newton's Laws of mechanics, these were adequate to cover most situations until people started looking at the really small world; that is to say inside Protons, Neutrons and Electrons.

These laws then broke down and led to quantum mechanics which allowed particles to have wave like properties. From this the 'Standard Model' of atoms was developed involving Quarks, Leptons & Gauge Fields.

When we consider symmetries; we never see total balance of charge change in the universe, quantum gravity intervenes. Charge, Parity and Time transformations are seen to occur, but in some cases the reversal is not complete and it appears a new particle must be involved. It is very small, but could have both electro-magnetic and gravitational properties.

In the search for this particle, in the same sort of way that neutrinos were found; attempts have been made to shine a modified proton particle, the axion, through a brick wall, then rejoin it to a proton on the other side. No luck so far. The modifiers are magnets and they are not thought to be powerful enough. We could do with a Magnatar Star!

Gravity is just another gauge field, but it affects time and therefore distance measurement, since distance = speed x time. Axions may also be responsible for dark matter and energy. Einstein explained the expansion of the universe, very nearly, but another particle, the Dilaton was introduced to help complete the explanation. Light and red shift are now understood, but a gravitational field is required to complete the balance.

In 1934, Born and Infeld examining Maxwell's equations found them to be satisfactory except at the point source where if $x = 0$, $1/x$ leads to infinity. They postulated that the mass of an electron resides within its magnetic field. This led to the idea of non-linear electro-magnetic fields. Combining all the theories surrounding Axions and Dilatons leads to the idea of a confined field between two concentric spheres, where externally there would no charge. This takes us back to the Leiden Jar.

If Axions had a similarly contained electro-magnetic field they could have mass related to this field; which in turn may be responsible for Gravity.

And there was I thinking it was just something that kept our feet on the ground.

Joint events

Many local network events are organised in conjunction with other organisations in our area. Each is identified by its initials in the events list, as follows:

BES: Blackburn Engineering Society
CMI: Chartered Management Institute
IMechE: Institution of Mechanical Engineers
IOP: Institute of Physics
K&DES: Kendal and District Engineering Society
PESC: Professional Engineers South Cumbria
UCLan: University of Central Lancashire
NWAA: North West Aerospace Alliance
RAeS: Royal Aerospace Society

Sub-sea High Voltage and Fibre Optic Connectors

Mike Henry & Jonathan Hardisty, Expro
Crooklands, 10th March 2011

If a picture is worth a thousand words then a video is worth ten thousand.

Mike Henry introduced the Expro talk on sub-sea connectors by describing the changing arrangements used in the off-shore oil and gas industries, leading to much greater use of plug together units on the sea bed and hence the need for connectors capable of effecting this process. A typical site will now have a number of oil 'trees' at well heads connected to separators and manifolds before the oil is brought to the surface or piped ashore. All these items need to be plugged together electrically, hydraulically and with data and instrument connections by an umbilical cable. Expro can supply all the connectors except the hydraulics.

The mother vessel is often now floating rather than fixed and has numerous umbilical connections to groups of plant on the sea bed; up to 3000m down. All the operations are controlled and monitored from a Control Room aboard the vessel.

Expro equipment is installed all over the globe and apart from the 290 people at Ulverston; the company has people in Brazil and the USA. Mike then showed a short video of a cross sectional model plug and socket engaging and disengaging.

Jonathan then concentrated on the HV connectors which are required for the major pumps and plant on the sea bed; often 11,000 volts and 3 phase systems.

Essentially the umbilical ends in numerous male plugs with matching sockets fitted to manifolds or trees. These plugs can be plugged in by a remotely operated vehicle (ROV) and unplugged as required for maintenance of the item. Up to 100 operations are catered for in the 25 year design life of the connectors.

The connection is made 'wet'; that is to say the male part of the plug is exposed to the sea and in the mating process is it wiped dry twice before engaging with the female electrical part. The electrical parts are gold plated copper. The procedure is to ensure mechanical alignment first by concentric sleeves engaging; the male nose then passes through a 'plastic' gate opened by depressing a shuttle pin which acts as a valve to an oil filled chamber. As the nose proceeds it passes through a second 'plastic' gate where oil is wiped off before engaging with the female contact. A flexible sheath covers the oil filled chamber. This deforms under the water pressure pushing the oil pressure up to the same level; thereby ensuring no in-leakage to the cable itself. A mechanical latch then engages to ensure the plug is not disconnected accidentally. This latch can be handled by the ROV. The 'plastic' parts are of course propriety elastomers, precision machined.

A very extensive test programme, involving electrical up to 200kV, mechanical up to 570 Bar (8200 psi) and latterly 3D X-ray is carried out to ensure very high reliability and so far 350 cumulative years mean time between failures has been achieved.

How to insure power generation in the world market

Alan Fitzpatrick CAN
Swallow Hotel, 29th March 2011

A small, but interactive audience, listened with some amazement that insurers seemed to pay out for accidents that had been caused by negligence or deliberate over-riding of safety systems.

Alan Fitzpatrick started his career with Cunard, where he achieved Chief Engineer certification. He then joined Vulcan inspecting power stations, paper mills and chemical plants as surveying engineer. After moving to Sun Alliance as manager of power station contracts he recently joined CNA, an American Insurance company working in the London market as Risk Engineer. He is an honours graduate and chartered engineer.

From the above it can be seen that the insurance business has three parts; the insurer, the broker and the risk engineer. The aspect not always appreciated is the two parts of the claim; that for the equipment itself and that for loss of income from inability to generate: referred to as Business Interruption (BI). The latter can often be many times the cost of kit depending on the length of time to reinstate generation capability.

Alan also explained that no single insurer will cover a major plant, but one company will take the lead and others will be invited to take various percentages of the balance.

He then gave various examples of plant failures and their costs.

The failure of a transformer in South Wales was £1m for the replacement but £26m for BI because of the procurement time. Whereas a single wind turbine failure would be about £1m; the export transformer for the whole wind farm might be £11m for the BI cost, though not all wind farms are insured for BI. Typical failures for wind turbines are 3 in 20,000 due to fire, whilst lightning takes about 100 blades per year at £120k per blade and often all 3 need to be replaced to get the balance right.

A new wind farm is being built 69km out off East Anglia. This will have 80 x 3.6 MW with 12 m blades at a cost of 440 m Euro. It will have 2 x 100% transformers with a DC converter and cable. No BI is involved but a new ship is being used to build the farm and the maintenance will be by helicopter. This poses new risk assessments. On top of that; during the build, a protection vessel is normally left to 'guard' the farm, as if a large ship sailed into the farm it might destroy 1/3 of the field in one go.

Alan concluded by saying it is a very interesting and varied life and there are vacancies for risk engineers at good remuneration.

Clean Coal

Dr Geoff Morrison, Clean Coal Centre
Barrow, 9th March 2011

Doctor Morrison commenced his excellent presentation by recalling that Britain was once a major producer and user of coal, peaking at 200 million tons a year. This gave rise to the International Energy Centre; a Centre for Excellence of coal usage being in Birmingham. Some 15 countries and a similar number of industries are now part of this organisation. Sadly since its establishment it became obvious that the UK, with very few exceptions, has stood still for 30 years in this field.

Initially the IEA dealt with SO_x, NO_x and particles. Electrostatic precipitators soon gave 99.5% collection of dust and Flue Gas De-Sulphurisation removed 95% of SO_x.

Since NO_x also forms acid rain low NO_x burners and selective catalytic reduction has also brought this down by 70%.

In 2008, the EU set limits of NO_x at 500 mg/m³ by 2015. At least 8 of Britain's large coal fired power stations will not meet this target and will be shut down; about 8 gigawatts (GW). Together with ageing nuclear being shutdown, 25 GW of new generation plant will be required by 2023.

The new challenge now is CO₂, which is deemed to be responsible for global warming. The limit for discharge for coal will be 600g of CO₂/kWhr. Even the most efficient coal fired power plant in the world can only achieve 800g/kWhr presently. If nothing is changed by 2050 an extra 60 giga-tonnes of CO₂ will be sent into the atmosphere every year; with China contributing 32%.

What can be done?

Firstly improve thermal efficiency(η), second burn with oxygen rather than air, thirdly capture the exhaust CO₂. Burning with pure O₂ is deemed too difficult.

The highest η so far is in Denmark where a super critical plant achieves 47% with a steam pressure of 29 MPa (290 Bar, 4260 psi) and temp of 580°C; with several other plants around the world at 45%. This also achieves NO_x of 20 mg/m³, but CO₂ of 743 g/kWhr, still above the EU limit.

Carbon capture is therefore still required and this can be achieved by scrubbing the flue gas with ammonia (or similar) vaporising the liquid then compressing it and sending it through pipes to suitable underground or undersea storage. The energy penalty for this process is huge and could lead to an overall reduction of 14% in thermal efficiency, with associated extra coal being burnt at huge extra cost.

In the UK £1b has been allocated to trying to solve the problem and so far a pilot plant has been built at Longannet power station in Scotland with the intention of piping the CO₂ to exhausted oil wells in the North Sea.

World burning of coal is set to rise to 3000 Mtonnes a year with 40% by China, where 58 new plants greater than 400 MW are being built, but they are all super critical with SO_x, NO_x and dust capture being better than EU limits, but the CO₂ issue is only just being addressed.

Why do we need Smart Grids

David Healey
12th Jan 2011

An interactive audience listened to a very informative presentation by a person with 20 years experience in the energy monitoring field.

The answer is that by 2030 the UK is facing a 30% shortfall in base load generation.

Existing power flows are measured in real time down to the 33 kV level grid. Below that the supply companies know the total peak demand but little detail of how much and where the demand is. Smart Grids offer the prospect of knowing the instant demand of every consumer.

David explained how the revolution in telecoms will enable embedded monitoring to provide this information and if required control local demand to prevent overload on the system. In addition it will enable suppliers to 'see' energy stealing which might be up to 100 kW in the case of an illegal cannabis farm!

The other benefit would be to close the circle of generation → distribution → consumption, since with private generation via solar cells and small wind turbines; this generation can then be accommodated properly within the system. To take full advantage of this 'green' generation, batteries will be needed to store energy during times of excess generation and supply energy during times of shortage. It may be that tariffs may vary during the day to encourage this home generation.

The main concern at present is to develop a smart system that is secure from hackers and this may involve rebuilding grid lines to transmit information as well as power. That brings its own problem of EMC emissions. His last rather disturbing comment was that there is a desire to reduce gas demand to make us independent of imported supply.

A question was raised as to why the old Economy 7 was not used more to balance day/night load, without all the need for internet type communications.

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