eMech

IMechE West Cumbria e-Newsletter
Edition 5, April 2003

I MECH E
West Cumbria

CONTENTS

(Please click on the links below to go to the article)

EDITORIAL

New Chairman Elected!

Thanks to all who attended our AGM and Falkirk Wheel presentation on March 19th. After 2 years of being driven and harried by Adrian Norendal, we now have a new Chairman in Ron Graham, Finishing Manager at Iggesund Paperboard. Whilst Ron doesn't have the same intimidating presence as Adrian (but then again, who does..?), Ron is keen to continue to focus our activities, and to ensure we build the best network in the country for all mechanical engineers, both professional and aspiring, young and…. Please check out the new committee list and feel free to contact them at any time – we need your ideas for events and activities at ANY Time!! – PLEASE let us know what you think!

New Young Members Chairman Elected!

Thanks to Paul Graham for coming forward to represent our younger developing engineers. We hope Paul can come along to our next Committee meeting (great pie & peas promised..) and begin to help make sure that we involve all engineers at all levels

Regional Chairman Praises West Cumbria!

We were honoured that Jon Leigh, IMechE Regional Chairman took the time to visit us for our AGM. Jon spoke warmly of the activity levels in West Cumbria and particularly noted and thanked Adrian Norendal as the catalyst for our progress and enthusiasm.

In a climate where getting as many as 30 people along to any meeting is considered an achievement in other (more densely populated) areas, to get over 50 members along to the AGM & Falkirk Wheel presentation was a great demonstration that distance is no barrier given good promotion of interesting subjects, in keeping with the current IMechE Presidential Address, 'Marketing The Profession'.

Immediate Past Chairman To Address HQ!

Like a Christian entering the Lions' den, Adrian has been invited to speak at an IMechE HQ Regional Officers Seminar in June on the topic "**The Role of the Chairman**". As re-founder of the West Cumbria Area, we would not be here without the background work and persuasive skills of Mr Norendal, so some highly pertinent observations and

experiences will be shared with the other national attendees. Expect to see the headlines in PE!!

Why Are We Here???

One of the initiatives from the NW Regional Committee is to consider what each of us wants and expects from the IMechE. At present, as an Area, we get something less than £3 per head per year to provide an events programme and all other activities – do you feel this is a fair proportion from your annual subscription (>£120)? **What does the IMechE mean to you??** We need to get some pretty immediate reaction to help Jon Leigh put our views forward to the Committee of Regional Chairman, so **PLEASE** take a few moments to fill in the email questionnaire that will follow this **eMech** and let us know what you think – Many Thanks!

New Programme Takes Shape

The programme for next year is already well advanced, with the following highlights already in place:

QUICKSILVER – A prestige presentation on the new, British attempt at the World Water Speed Record

RAISING THE KURSK – The engineering required to recover the shattered body of the huge Russian submarine

CORUS ENGINEERING – A visit to the facilities in Workington

NISSAN, SUNDERLAND – A visit and tour around the most productive car plant in Europe

We will keep you informed as the programme takes shape, but PLEASE make sure you keep us up to date with your email address – this will be the ONLY reliable method of communication from September!

TECHNOLOGY 2003 – SPECIAL PREVIEW OFFER

A **SPECIAL OFFER** to all IMechE West Cumbrians: We can get access to a **PREVIEW** of the **TECHNOLOGY 2003** exhibition to be held on Monday, April 28th at Sellafield, from 6.15pm to 8pm. A small buffet will be provided

Over 40 exhibitors in the fields of design, maintenance, operations, waste management, process control & procurement will be on hand and the exhibition will be opened by Laurie Haynes, CE BNFL Government Services Group. The exhibition is to be held in B111 Learning Centre, North Gate, Sellafield and will be fully open on Tuesday April 29th from 9.30am to 3.45pm. If you want to come, **PLEASE** call (01946 811771) or email me (cgeorge@capalex.com) before April 22nd to make sure there are enough sandwiches to go round..

Please also don't forget - feel free to forward **eMech** to anyone else (with their permission!) or get them to drop their email address to me so we can keep in touch. Also… if you find you do NOT want to be emailed with **eMech**, please email the Editor with **Unsubscribe** as the subject and we will happily remove you from the mailing list.

CHEERS and a HAPPY EASTER to you all!!

Editor: Chris George, Publicity Officer, IMechE West Cumbria
Tel (Work): 01946 811771

1. Bluebird – The Adventure & Recovery

Rosehill - The Barn, Wednesday May 14th, 7.30pm

Please put that date in your diary for the last event of our current programme. Bill Smith is the Press Officer of the recovery team, an engineer by profession, expert welder and fabricator. Bill has a habit of building the things that most people have to buy, a restorer of classic cars and creator of the underwater video system used to locate Bluebird. It sounds like a fascinating end to our excellent season – don't miss it!

Find out more from the Project Bluebird web site: http://www.bluebirdproject.com/

Back to Contents

2. Beyond The Edge Of Darkness

Florence Mine yields total respect

It wasn't just dark, it was black – TOTALLY, absolutely, completely, utterly black. And silent – just no noise at all. At the lowest point of the underground tour by 34 hardy West Cumbrian Mechanicals, we were invited to switch off the head-mounted torches and stay still. It was a truly spiritual moment, time to pause and reflect on the need of man to seek out minerals from inside the earth and the awesome courage of those who dared.

Mining has a long and proud tradition in Cumbria thanks to the particular geology that formed the various strata and mineral deposits over millions of years, and the entrepreneurs and men who dedicated themselves to seeking and extracting. The Florence Mine is the last working haematite mine in Europe, and was sunk in 1914. The introductory presentation around a 3-D geological model gave a fascinating insight into the scale of the operation and the difficulties inherent in finding the rich iron ore haematite deposits. Never again will any Sellafield commuter pass over the area without some thought to the industry hundreds of feet underground.

Unlike coal seams, which can be found in reasonably regular and predictable strata, haematite is formed through faults and the action of water and other mineral deposits acting on the limestone. As such, it is found in random 'higgledy-piggledy' outcrops, which make its detection and extraction extremely difficult. The model gave some indication of the number of boreholes sunk to detect the deposits, before commencing the task of tunnelling to the precise location in 3 dimensions. Systems of over 4 miles in length were needed to get to some deposits.

Once equipped in hard hats, wellies, head-mounted torches and carrying long life battery packs, the tour began by looking at the winding gear on No. 2 shaft, sunk in 1947 but now sadly idle due to the extreme costs of meeting stringent Health & Safety requirements. After viewing the huge winding wheel and brakes, those members with enough courage were supported whilst looking down one of the actual lift shafts – a sobering foretaste of what it means to go underground.

The available entry was via a surface drift shaft which proceeded down a 1 in 4 gradient to a level some 70 metres below. It is up this incline that all materials are dragged to the surface. The collected torch lights of so many people perhaps gave a false impression of illumination, as we were later to discover – there is absolutely no other source.

As the descent proceeded, the increasingly squelchy ground resembled walking on rare meat, with the strong red stain of the iron ore reminiscent of the blood that had been spilt in the hard search for the earth's resources.

Water is the biggest problem for the mine, which acts as a drain for the huge volumes of water flowing through the rocks and channels. BNFL currently pays to 'dewater' the mine, at the rate of some 420 tonnes per hour, every hour. Even at this rate, the lower parts of the mine remain flooded.

Once down onto the main 'roadway', approximately 2.4m^2 in section, we walked along, noting the various rock bolt arrangements that helped stabilise the roof material in places, but otherwise the tunnel was unlined. Trig points were marked along the tunnel to correspond with the bore hole position and depth that first indicated it would be worth tunnelling. The look and texture of the different rock formations was explained as we moved further on, eventually descending by a short, steep incline to a spectacular chamber with glorious displays of quartz, speckled haematite and kidney ore. Also at this level was a large fan house to assist the otherwise natural ventilation necessary to sustain life so far underground. An explosives 'house' had also been built to safely contain and shelter the dangerous materials that actually created the mine – careful drilling and blasting every centimetre of rock to form the tunnel in which we now stood.

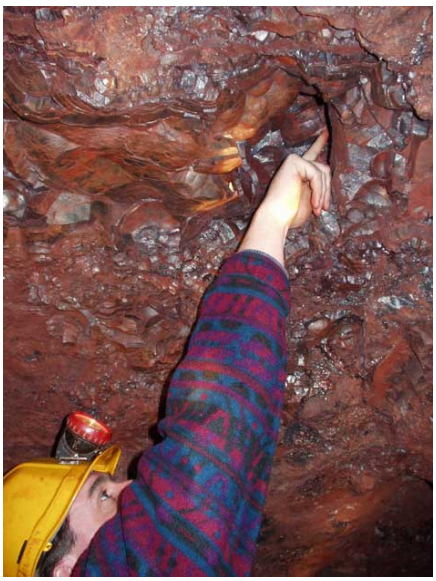
The mechanical apparatus used to assist mining was evident, mainly air-powered loaders to shovel up the displaced ore and debris to be brought to the surface. There was a full rail system in place to assist movement of the loaded trucks, and the final ascent to the surface was by winch & cable, but the main impression was of the sheer amount of human effort that had been needed to make and develop the mine.

There is also a heritage centre run by volunteers who kindly opened their museum for us, so we could appreciate the actual artefacts and sobering medical/accident records from the times when the mine was an active and thriving industry.

The mine is now producing various grades of ore, for use in annealing castings or when finely ground, as a vivid dye – something we could all appreciate when we got home…

As the mine owner and our tour guide, Gilbert Finlinson displayed wonderful knowledge earned from a life in mining, and delivered with passion and humour. He remained patient in explaining and answering all questions, and involved everyone in the tour.

We had spent over two hours underground – it had passed in a flash, and then we were back to the comfortable world above ground. Total respect to all miners, everywhere!



Mine owner and tour guide, Gilbert Finlinson explains the finer points of geological formation to some younger Mechanicals (left) whilst IMechE West Cumbria treasurer, Mike Edie, thinks he's just found gold (right)….

Gilbert Finlinson receives the IMechE history book from new IMechE West Cumbria Chairman, Ron Graham

Anyone interested in supporting and getting involved in the work of the Florence Mine and the West Cumbria Mines Research Group should call 01946 820683.

Back to Contents

3. Water Lotto Ingenuity

Millennium Link Creation Provides Many Engineering Challenges

What a shame the millennium only comes round every 1,000 years! It seems to take such an accident of timing to inspire us to do something 'special' to mark the occasion. And it falls upon the shoulders of mechanical engineers to make it work...

In Scotland, a project was born that dared to re-invigorate the Forth & Clyde and Union Canals to provide a complete link from coast to coast, west to east, which could be navigated by new generations of leisure craft and canal boats. In turn, the area would be made accessible for all people to enjoy - residents, tourists, cyclists and pedestrians, and it was hoped would also bring back industry and stimulate employment.

At the recent IMechE West Cumbria AGM, Robert Jackson, Mechanical & Electrical Engineer from British Waterways (Scotland) described the challenges and ingenious solutions that the project presented, crowned by the exceptional and unique Falkirk Wheel, the only rotating boatlift in the world.

The canal system was of course at the heart of the industrial revolution, providing a vital means of moving large loads and connecting communities. However, since the 1960s, the system in Scotland as elsewhere fell into disuse, overtaken by the road system and the rise of the HGV. Many housing and shopping developments were built that ignored and destroyed the original continuity of the old canal network, and it was this that caused the Millennium Link team most headaches.

Besides needing to dredge out and remove a remarkable amount of debris and rubbish, including not just the standard shopping trolleys but also cars…, the first innovation came in devising local lowering of the canal using a 'drop lock' system to provide the necessary headroom – a 3m 'air space' - under some of the newer developments. The route of the original canal sometimes had to be changed to avoid insurmountable obstacles, and all the

many existing bridges had to be refurbished and made accessible to modern mobility standards. Many types of lifting bridges were also installed or refurbished.

Utility services had to be renewed and rerouted, and here lay a smart clause in the original installation contracts – to 'lift & shift' , for the service provider to be responsible for any such later re-routing.

But the crown jewel of the whole project lay in the Falkirk Wheel, which was devised out of a desire to fully link the two canals and provide, for the first time, a true link from each coast to coast. However, there was a 35m difference in height between the higher Forth & Clyde and the Union – what a pity that water hills haven't been invented. The design of the wheel not only provides an elegant technical solution to the height difference, but it does so in an aesthetically pleasing and highly efficient manner. Using a central 3.7m diameter axle with huge rotating cogs to keep the two cradles level, the system is designed to balance the loads in each compartment by control of water levels, employing all the excellent principles expounded by Archimedes. Given balance of the 200 tonnes in each cradle, the effort to rotate is remarkably small, equivalent to 10 3kW toasters being used.

The detail design had to be highly practical, to be road transportable and capable of assembly on site. simple bellows and flap gate systems provide the sealing of each compartment with its precious cargo of water and craft. Fenders in the cradles also had to be capable of withstanding the impact of 20 tonnes at 4 knots, a not inconsiderable amount of kinetic energy.

The completion of the Link through the Union canal into Edinburgh was assisted by Historic Scotland, and has encouraged new and highly desirable canal-side housing developments that sold out before completion. But it was sad to learn that the Glasgow end is once more suffering from wanton graffiti and vandalism. In fact, the uptake of use of the full waterway is extremely low – last year only approximately 150 craft navigated the full route. However, one enterprising owner of a moored fish & chip shop has added a serving window to the canal side to provide the world's first sail-thru 'chippy' – he will be well prepared for the uptake of use which it is hoped will eventually occur. The use of the restored pathways and new cycleways seems to be much more evident and welcome.

As a total project, the original budget of £78m rose to only £85m on completion, which was remarkable as so many problems were only fully identified once the project had got under way. The funding was obtained because of the big nature of the project in a short space of time, and the highly visible, presentable form of the Falkirk Wheel. Many funding sources were used, primarily from the lottery funded Millennium Commission but also various European and regional government funds.

Robert Jackson, Mechanical & Electrical Engineer (British Waterways - Scotland) receives an IMechE West Cumbria Pit Tankie from event organiser and treasurer, Mike Edie

Back to Contents

4. Engineering Education Scheme – Help, Please!

Alastair Billson, West Cumbria Area Academic Liaison Officer, writes:

Dear Colleague,

Hopefully you will be aware by now that the IMechE is once again active in the West Cumbria area, many of you will have attended the series of lectures and visits that have been arranged over the past 2 years. The committee tries to compile an events list that is of interest to as wide an audience as possible, a marker of the success is attendance at events. To date we have been well supported and long may this continue, but there are other ways you can support your own personal development, and our broader aims.

As part of the wider scope of the IMechE West Cumbria Area (WCA) I have a particular responsibility as an Academic Liaison Officer. With this role in mind I would like to raise your awareness of a particularly relevant initiative that is currently running in some local schools called the Engineering Education Scheme (EES). The WCA committee support the introduction of 6th form school children to Engineering Projects as a valuable means of increasing awareness of the profession at a highly formative stage. However without the hands on involvement of interested members very little progress is likely to be achieved. Mentors are required to organise and facilitate EES groups, and the benefits are not just one-way, any individuals who get involved will personally gain credit towards chartership and further develop key communication skills routinely needed in your daily working environment, its definitely a challenge that runs over a school year. Launch day take place early in October working to a deadline of end of March in time for a Project day in May.

The basic aim of the scheme is to encourage high calibre students to study engineering at University. The scheme is prestigious, being run by the Royal Academy of Engineering. Past involvement has lead to good publicity in the local press. The scheme is well established and has been running successfully for a number of years, with support available as required.

Past experience of the scheme would indicate that it is successful - up to 75% apply for and accept degree courses in engineering (one student was accepted without interview, the letter of acceptance cited participation in the EES scheme as a key factor).

During December there is also a 3 day long university experience at Newcastle University. The students undertake supervised lab work and basic machine processes and fabrication, its good fun and amazing what can be accomplished. Examples of projects include a fully working ultrasonic level measurement. In the spring, the team have to produce a formal project report and then in the August Celebration and Assessment Day they have to do a number of presentations to an assessment panel as well as setting up a display stand and talking to people about their projects.

Previous projects have saved substantial sums of money for the sponsoring companies.

The committee recognise that adopting a mentoring role in support of the EES will involve a degree of personal commitment, we all have busy lives and many demands on our time so it is not something to undertake lightly, but the rewards are tangible for all involved.

The scheme is administered by David Tunnicliffe who would enthusiastically support anyone offering their time and experience. David has close contacts with participating schools and already has established schemes running across Cumbria.

In essence the role is one of facilitation, and providing guidance and support to nurture intrinsic skills and abilities within the particular school group, enthusiasm is the key ingredient. Contact with groups could be managed to around 1hr or so per fortnight if appropriate progress monitoring and planning is put in place, on the basis that the more the students put in under their own steam the more they should get out. Success in this

scheme equates to a committed teacher, supported by a good engineer and a keen group of pupils.

If anyone would like more information or are interested in volunteering then in the first instance contact either myself, Ian Willey or David Tunnicliffe. I can assure you that your support would be gratefully received. Any ideas for suitable industry based projects would also be very welcome see the table below taken from previous years.

If you know of anyone who may be interested please pass this letter on.

The table below gives some details of projects that have been undertaken as part of the EES Scheme

Project	School	Contact
Energy & efficiency saving	Millom	Ian Willey / Ben Whiteley
Removal of lint from waste water	St Bees	Paul Graham / Andrew Edwards
Sludge sampling	Cockermouth	Luke O'Brien / David Wright
Clearing pipework blockages	St Benedicts	Andrew Bennion / Chris Spence

Contact details	Ian Willey, B170 S&ERM BNFL Sellafield	019467 79161
	David Tunnicliff, Carlisle College	01228 534 120

Back to Contents

DIARY

May
Committee Meeting
Date : Wed 07/05/03
Time : 19:30 hrs
Venue : Swan Pub, Cockermouth
LECTURE:
The Bluebird Project
Date : Wed 14/05/02
Time : 19:30 hrs
Venue : The Barn, Rose Hill
Numbers : < 100
Booking Req'd: No
Refreshments : Yes
Organiser : Andy Cumber Tel : 019467 77431

Back to Contents

CONTACTS

IMechE West Cumbria Committee 2003/4

Chair	Ron Graham	ron.graham@iggesundpaperboard.com	01900 600261
Vice-Chair	Andy Cumber	andy.m.cumbor@bnfl.com	01946 777431
Secretary	David Williamson	david.j.williamson@bnfl.com	01946 776214
Treasurer	Mike Edie	mike@edie.swinternet.co.uk	01946 784304
Press/Publicity	Chris George	cgeorge@capalex.com	01946 811771
Academic Liaison Co-ordinator (FE)	George Williams	george.williams@lcwc.ac.uk	
Industrial Liaison Co-ordinator	Ron Nixon	ron.g.nixon@bnfl.com	01946 785426
Academic Liaison Co-ordinator (Schools)	Alastair Billson	alastair.jm.billson@bnfl.com	01946 785731
Young Members Group Chairman	Paul Graham	paul.x.graham@bnfl.com	
Immediate Past Chairman	Adrian Norendal	adrian.h.norendal@bnfl.com	01946 775700
IMechE REGIONAL MANAGER	**Stephen Gasser**	s_gasser@imeche.org.uk	07887 931689

Back to Contents