President’s Message

Dr Gordon Masterton, OBE will begin his presidential term on 28th September 2010. Gordon graduated with First Class Honours in Civil Engineering from Edinburgh University in 1976. He joined Babtie Shaw and Morton and his design experience was grounded in a variety of projects such as the Western Isles Council Headquarters; Buckhaven Coastal Defence Scheme; Gourock Health Centre, and, notably the West Wharf toilet block for Govan Shipbuilders! He moved to England in 1978 as Section Engineer for 8,000km of tunnels and the Tees Outlet Works on the Kielder Water Scheme. He then gained a Masters degree in Concrete Structures at Imperial College, London. His next few years of specialisation were in bridges, ultimately leading Babtie's bridges and buildings units. As, by then, a Director of Babtie Group Ltd, he spent two years in Malaysia, and then returned to the UK as Managing Director, Facilities and later MD Environment. On the acquisition of Babtie by Jacobs, Gordon was appointed Vice President. During his seven year tenure in charge of the Environment business turnover grew from £26m to £100m, with 1500 employees. In 2009 he led the team bidding for the role of Government Representative on London's Crossrail project, at £16bn the biggest construction project in Europe, and, thanks to an excellent support team, they won it! He has been mainly based in London since then.

We live in interesting times! The financial sector has suffered a damaging confidence dent; economies across the world have been affected by the actions of a group of uncontrolled, bonus-hungry speculators; erupting volcanoes have been filling the skies with ash and bringing transportation systems to a halt; governments have been de-stabilised by parliamentary scandals. One could be convinced that we live in the worst of times!

But as I write this in 2010, with the benefit of hindsight I know that this could equally well have been said of many times in the past. We've survived many financial bubbles and scams; we've survived many natural disasters; we've survived many parliamentary scandals of financial obfuscation, vote-rigging, or private indiscretions that may have brought down governments. Last century, we even survived two periods of almost all-out global warfare. And on every occasion, the world has bounced back. Even the fiercest wars come to an end, if only through exhaustion, markets eventually recover, we rebuild after natural disasters, and although many governments may have fallen, governance continues. Just as we have in the past, so we will recover from these "little local difficulties" again. It’s just a matter of time. The resilience of human intellect and the capacity of the planet to adapt have served us well over the sum-total of the period of human life on earth. Let’s call it a PPP – a planet people partnership!

At the moment this country’s particular “local difficulty” is its apparent inability to balance the books, and construct a sustainable economic future. The new coalition’s response to this is to dramatically cut government expenditure, from which no-one will be immune. My only plea is that these cuts should be seen as an opportunity to eliminate or reduce wasteful inefficiencies, but not at the expense of investment in projects or programmes that create future well-being, or much-needed step-changes on our road to a sustainable future.

Engineering has always had its roots in economic activity. Engineering takes scientific advances, and applies them to means of creating wealth and improving the quality of life. This has led to improved transportation, cheaper means of production, cleaner water, more sustainable energy, better and faster electronic communication and in countless other ingenious applications of science. The sum total of engineering’s influence on our quality of life is incalculable. Engineers have defined the physical parameters of what we call "civilisation". If we are to nurture and strengthen the planet people partnership throughout the next, critical, 25 years, we need engineers to be at the forefront of defining the new paradigms. We can’t afford not to!
This Institution has a proud record in this respect. In 1858 the Institution of Engineers and Shipbuilders in Scotland was responsible for a public meeting, held in the Glasgow City Chambers, to establish "An Association for Promoting Safety, Economy and Absence of Smoke in the raising and use of Steam". These were the elite of the Scottish engineering community at that time, taking the initiative to take an issue, crucial for environmental improvement, to the general public, to allow a wide debate from an informed basis. Do we do enough of that today? I don't think so. Government, large, small and in-between, needs engineering advice as it never has before and I fear, as yet, it doesn't really get it.

In a period of austerity, there is a huge risk that our priorities get distorted. A government that is obsessed with cutting costs might make the wrong cuts, might take the easy option, and might resort to short-term issues rather than long-term sustainability. It is up to engineers to play their part in assisting governments to maintain focus on the most important issues facing the planet – and right now that’s to reduce our global reliance on carbon. Whether you believe that climate change is man-made or not is immaterial. I prefer to take the pragmatic engineering viewpoint that it’s eminently sensible to conserve finite resources as much as is practicable, and to reduce emissions as much as possible. If these measures also help mitigate climate change, that’s a bonus. Arguing about whether or not it’s a man-made phenomenon is an arid argument. Sceptics would, presumably, urge no change and have us muddling on, using up our fossil fuels, and pumping greenhouse gases into the atmosphere like there’s no tomorrow……..

I’m delighted that IESIS is doing its bit to keep this issue at the forefront of its activities. Iain MacLeod’s Energy Strategy Group has been identifying the most effective way to influence the Scottish and Westminster administration’s policies on future energy production and distribution. It’s a complex area, and one that demands the highest quality of strategic analysis and sound, pragmatic, advice. Iain’s group sets its stall out to provide an engineering perspective on the issues, for the benefit of decision-makers.

Edmund Burke said ‘All that is necessary for evil to triumph is for good men to do nothing’. Let’s paraphrase that a little for our own purposes. ‘All that is necessary for misguided policy to prevail is for engineers to do nothing.’ It’s a challenging time to be an engineer, but that’s exactly when engineers have their finest hours. We thrive on challenges. We have a bias for action. We get things done. Right now the planet people partnership PPP is under threat. And it’s not the planet’s fault. It’s time for the people to put in their share - and for engineers to lead the way.

Vice President Statement

by I MacLeod FIES

During the early part of my career I held a number of appointments in practice, in teaching, and in research. In 1981 I took up the post of Professor of Structural Engineering at the University of Strathclyde and retired from that in 2004.

At Strathclyde we did quite a lot of research work on computer aided design. For me, the main advantage of this work was in gaining a deeper knowledge of the design process. The basic process is quite simple: you define the requirements (taking care to identify them all), gather relevant information, look at different solution options, choose the best and produce drawings and specifications so that the thing can be made. Described like this it sounds quite simple but complexity arises when the requirements are not clear, where needed information is not available and where the choice of option is not obvious. That is there can be a great deal of uncertainty. Also this basic process is used what computer programmers call recursively for parts of the system as well as the overall problem.

This process can be generalised as the fundamental approach to solving non-determinate problems i.e. those for which there is no unique solution. This is the process used by professional engineers. It is how problems are ‘engineered’. It is used widely by other professions and by people in business. But it tends to be ignored by politicians. They have their own agendas. They make decisions which deeply affect the populace based on flawed processes. Evidence for this is most prominent in the UK Government policy for energy - see the report of our Energy Strategy Group in this Newsletter. Non-determinate problems can not normally be solved by logic alone, judgment is needed but the engineered approach takes the logic as far as it will go rather than the typical political approach which is to start with the solution and justify it by some means.

I joined IESIS in 2006 thinking that if we did not have a multidisciplinary professional engineering organisation we would want to invent one. Global and societal problems are becoming increasingly complex requiring a much wider range of issues to be considered and requiring application of the ‘engineered’ approach outlined above. The Energy Strategy Group is making a very positive proposal as to how this can be achieved for UK energy policy. I would like to see IESIS adopt the role of champion of engineering thinking - as a promoter of the engineered approach to problem solving.
Membership Activities – An Update

We are delighted to report that we have had another successful year, with over 70 new members! We are delighted that many of our new recruits are students. We hope they will be lasting members and stay with us beyond their student days.

Presentations have been made to Engineering student classes at Glasgow University, and Glasgow Caledonian University. Posters and leaflets have been sent to many Engineering departments in Glasgow and area, to Universities, Colleges, and employers to publicise membership and our evening presentations. We hope to carry out the same work again this year.

We have offered to visit to introduce ourselves to Student class groups and it is hoped more of this will be undertaken this year.

Members are continuing to encourage colleagues of all ages to join. We have attempted to encourage student and graduate members to keep their membership live once they move into their working careers.

Hunterston Terminal – Scotland’s Coal Port

by Captain Ron Bailey FIES, Harbourmaster, Clydeport

Hunterston coal terminal is owned by the Clydeport Ltd, and has one of the deepest sea entrance channels in Northern Europe. The Terminal lies within the jurisdiction of Clydeport Operations Ltd and that all ships are serviced by Clyde Pilots and Svitzer tugs. The terminal can accommodate the largest Cape size vessels afloat. The discharge rates are among the fastest in the UK. The site has a storage area of 25 hectares capable of storing up to 1.5 million tonnes of coal.

The terminal was constructed in the late 1970’s to discharge iron ore for delivery to Ravenscraig for the British Steel Corporation steelworks at Motherwell. The cost of the original construction, which required reclamation from the sea, and included direct reduction plants, cost £98 million. The terminal was opened by the Queen on the 5th June 1979.

After the demise of the Scottish steel industry, the terminal became a coal handling and storage area, and maintained the rail loading facilities to transport coal to locations in the UK. The facility now imports coal from a variety of countries for transhipment by land and sea.

The jetty is 443 metres in length with the outer berth having a depth of water of 24 metres at low water, and the inner berth with a depth of water of 18 metres. The outer berth can accommodate vessels up to 350,000 dwt, and the inner berth vessels of 100,000 dwt. Grab cranes discharge the coal to conveyors on the jetty and thence to the storage area. The total length of conveyors is 8,500 metres (5 miles) which deliver the coal to the stockyard, which is served by three stacker/reclaimers, with a stacking rate of 2,800 tonnes per hour, and a reclaimer rate of 2,000 tonnes per hour.

The terminal operates 24 hours per day, 365 days per year and provides the UK with a major coal import facility. The coal is imported from such countries as South Africa and Russia through the ports of Murmansk, Richards Bay and through Riga in Latvia. Other sources are America through the port of Newport News Indonesia and Australia. These various coals provide the right quality of mix for use in UK power stations. The average number of vessels discharged is four per month, The rail loading station handles the typical train load of 23 wagons of 71t each which can be loaded in under half and hour. At present some 10 train loads are dispatched per day but the plant has the capacity to handle 20 to 25 trains per day. From Hunterston the coal is delivered to Longannet and Cockenzie power stations in Scotland. Power stations in England such as Drax, Fiddlers Ferry, Ferrybridge, and West Burton as well as facilities at Cottam and Castle Cement are regularly supplied with coal. Coal is also shipped by sea from the inner berth to Ireland and Manchester.

The whole of the terminal activities are controlled from a 36 metre high control tower. The operator has electronic and visual aids at his command, CCTV, telephone and radio contact to select the direction and control of the flow of coal throughout the terminal. Weather conditions, noise levels and dust sampling are continually relayed to the tower from stations located in the surrounding district. Some 90 personnel are employed at the terminal.

A new 1600 megawatt coal-fired power station is proposed for the site at Hunterston which would reduce delivery costs and provide cheaper power. The planning process is at the consultation stage, which is due to finish on 20th August 2010.
THE TALL SHIPS RACES 2011
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Sir,
The existing wholesale market arrangements for the production of electricity are leading towards a crisis. EU directives require the retirement of about 20 Gigawatts of UK generating capacity (approximately one third of the total) by the end of 2015. Since the existing market arrangements have not brought forward plans to replace this plant, the probability that peak demand will not be met after mid-decade is very high.
The situation will be exacerbated by the development of wind power without adequate consideration of cost and of technical feasibility. This is leading towards a situation where the British people will have paid significantly higher electricity bills without significant reduction in CO2 emissions.
The fundamental source of these problems is that from privatisation in 1989, reliance was placed on competitive market-based investment and planning instead of on public authorities led by engineers. The engineering dimension requires to be re-introduced to the planning of electricity production.
To ensure that the UK populace is provided with an adequate supply of electricity, an independent, multidisciplinary, national body should be established to make recommendations for the planning of electricity generation taking account of all relevant issues. In 1926 a body of this nature was created by Stanley Baldwin’s Conservative Government: the Central Electricity Board; this and its successors served us well.

Tom Douglas CEng, FICE, FIStructE, FGS, MConsE, Consulting Civil Engineer
Colin Gibson CEng FIET CCMI, formerly Power Network Director, National Grid Group
Blair Armstrong BSc CEng FICE, formerly Manager of Renewables and Power Generation, Scottish Enterprise
Iain Macleod BSc PhD CEng FICE FIStructE Emeritus Professor, Department of Civil Engineering, University Strathclyde
Members of the Energy Strategy Group of the Institution of Engineers and Shipbuilders in Scotland - a multidisciplinary professional engineering organisation established in 1857.

At the same time we sent an open message to the leaders of the 3 main UK political parties the text of which can be read on at http://www.iesisenergy.org. More information about the activities of the Group can be found on this website.

When the new coalition Government was formed we sent our message to Chris Huhne, the Energy Minister. He eventually responded to say that he agreed that the planning system needs to be improved and explained how he proposed to do this. However his view of planning is concerned with planning consent issues for new facilities whereas we are proposing that there should be a Plan. In other words he is not receptive to the ideas that we are promoting. He is a successful businessman who likes to make his own decisions. He does not understand the realities of electrical power generation and therefore his appointment as Minister for Energy is dangerously negative for the nation.

Our next move is to go to the press - to try to get a national newspaper e.g. the Guardian, to do some investigative journalism on the UK electricity generation system and to make a front page story of it. We are preparing information for this purpose.

Our basic objectives are:
1. Persuade senior Government people that the existing policy for electricity generation is driving the ship of state towards a rocky shore.
2. Promote the principle that the most effective method of setting a course away from the rocks is via the appointment of a technocratic, independent government body.

It is interesting to note that there is a very good historical precedent for what we are proposing – see iesisenergy.org website.
The 100th James Watt Dinner 2009

The 100th James Watt Dinner was celebrated in style at the Radisson Hotel, Glasgow on Friday 9th of October 2009. Over 300 members and guests enjoyed an excellent meal. After dining, Carlo Dinardo, past President, presented a toast to James Watt. Professor William Banks then provided a thought provoking speech on the future challenges of engineers and John McKelvie delivered an extremely humorous end to the formal part of the evening. The evening was rounded off by our now traditional networking, where many members and guests circulated amongst old friends and colleagues.

Lecture Programme and Venues for 2010 - 2011

**Tuesday 21st September - The University Lecture**
Mr. David Westmore, “The AMC Floating Dock, Western Australia”
Room 201, George Moore Building, Glasgow Caledonian University, 2.45pm for 3pm

**Tuesday 28 September 2010 - The Presidential Address**
Dr Gordon Masterton, OBE, “Scots Engineers who Made the Modern World – Past & Present - with a look to the Future”
The Trust Hall, Clydeport Building, 5.30pm for 6.15pm

**Tuesday 9 November 2010**
Professor Rod Smith, “High Speed 2 Unifying the UK and developing the economy”
Carnegie Lecture Theatre, Charles Oakley Building, Glasgow Caledonian University, 6.00 for 6.30pm

**Tuesday 30 November 2010 - Joint Meeting with RINA, IESIS Hosting**
* Stephen Payne, “Titanic Revisited”
Carnegie Lecture Theatre, Charles Oakley Building, Glasgow Caledonian University, 6.00 for 6.30pm

**Tuesday 11 January 2011 - Joint meeting with IMarEST, IMAREST Hosting**
Bill McDairmid – Rolls-Royce, Dalgetty Bay, “Ship Stabilisers and other FIFE activities”
Glasgow Nautical College, 6.00pm for 6.30pm

**Tues. 8 February 2011**
Speaker to be announced, “The History of Lloyd’s Register”
The Trust Hall, Clydeport Building, 5.30 for 6.15pm

**Tuesday 8 March 2011**
Keith Clarke, CEO of Atkins, “Low Carbon Economy – Can engineers start to define questions rather than answer them?”
Lecture Theatre 1, McCance Building, Strathclyde University, 6.00 for 6.30pm

**Tuesday 19 April 2011 –Annual General Meeting & the Macmillan Memorial Lecture**
Michel Virlogeux, “The Design of Long Span Bridges”
Lecture Theatre K325, John Anderson Building, Strathclyde University

* Please note there has been a change to this lecture date from earlier editions of the programme.

Last session many members were disappointed when Michel Virlogeux had to cancel his prestigious lecture due to unfavourable volcano conditions. We are delighted to re-schedule his lecture for April 2011.
Last year the Institution increased the number of prizes awarded to outstanding final year students at Glasgow Caledonian University to three, recognizing the particular achievements of students in the areas of: Best Student (Final Year) BEng(Hons) in Mechanical & Power Systems Engineering, Best Student (Final Year) BEng(Hons) in Electrical Power Engineering, Best Student (Final Year) BEng(Hons) in Mechanical-Electronic Systems Engineering

At Glasgow Caledonian’s Annual Prize-giving ceremony, Professor David Harrison was delighted to present Mr Colin Jackson with The Institution of Engineers and Shipbuilders in Scotland Award for Best Student - Final Year studying for BEng(Hons) in Electrical Power Engineering

Professor David Harrison was also delighted to present Mr Mark Walford with The Institution of Engineers and Shipbuilders in Scotland Award for Best Student - Final Year studying BEng(Hons) in Mechanical-Electronic Systems Engineering

Professor David Harrison was also delighted to present Mr Nidhin Unnirajan with The Institution of Engineers and Shipbuilders in Scotland Award for Best Student (Final Year) BEng(Hons) in Mechanical & Power Systems Engineering
The Future Panama Canal

by H D Osborn, FIES

The Panama Canal is one of the modern wonders of the world. Its construction and operation is one of the greatest feats of civil engineering.

The construction of the canal was a superhuman effort against the travails of nature and human frailties. The works started in 1870 as a French enterprise led by Ferdinand de Lesseps after the successful completion of the Suez Canal. The works were directed by French engineers, along with others including the Americans. The works were dogged by political insurrections, earthquakes, tropical rains and difficult geology. Saturated clay slides engulfed heavy plant, the earthquakes destroyed railway lines and the climate almost defeated them like the collapse of the Darien scheme decades before. The effect of malaria and yellow fever took an enormous toll of human life. The abandoned plant were left to be enmeshed by vines and tropical vegetation.

Engineers arriving from France or other labour could be dead within a few days of arriving. Even Gauguin the painter came to make some money by painting portraits but only stayed a month. After 19 years work the French had to abandon the works in 1889.

The Americans who during these years had become involved in the works took up the task, led by such personalities as President McKinley and after his death by Theodore Roosevelt. Again the trials the French had suffered were to be experienced by the Americans. After another 25 years the canal was opened in 1914.

The canal is 50 miles long from the Atlantic to the Pacific, with an elevation above the sea of 312 feet. The present lock dimensions are 1000 feet long and 110 feet wide. Approximately 15,000 vessels transit the canal each year.

The largest vessel in 1913, before the opening of the canal, was the Hamburg – American line liner the “Imperator”of 52,000 tons. The lock chambers could accommodate such a vessel with ample room. On December 10th 1913 one of the old French bucket dredgers made the final cut thus opening a free passage. On January 7th 1914, an old crane boat, the French “Alexandre la Valley” made the first full passage without ceremony. The first ocean going ship to make the Atlantic to the Pacific passage was the “Christobal” on the 3rd August 1914, the same day as the First World War broke out.

The size of the locks dictated the size of the well known Panamax ships having a beam of 106 feet, thus allowing a tight fit of only 2 feet each side.

In the 1980’s, consideration was given to improving the canal to allow the transit of larger vessels. In July 2009 a consortium were awarded a contract to design and build larger locks for a sum of US$ $3.12billion. Other contracts have progressed to deepen and widen the canal particularly at the bends. Other works include raising the water levels of storage by 0.45 metres, thus providing an extra 165 million gallons per day to allow transit of vessels in the new lock system.

The new locks will be designed to take vessels of 366m in length with a beam of 49m and a draught of 15m. The new sets will each have three chambers, the lock gates having new design features along with the filling and emptying systems. Water saving basins adjoining locks were first incorporated in the design of the Rhine-Danube canal, and a similar system will be used in construction of the new locks. This will mean a saving of 7% of fresh water per transit than the existing locks, despite being 65% larger.

During the original construction it is recorded that 61 million pounds of dynamite were used. In the Culebra cut alone 96 million cubic yards were excavated involving 160 train loads per day. There were 76 miles of construction rail track that had to be continually lifted and re-laid or relocated.

Scottish based company Rockfall, who specialize in drilling and blasting underwater have recently carried out a number of contracts for the canal as part of the new developments. The work was carried out in conjunction with Bos Kalis Westminster Dredging, to deepen the approach channel at the Pacific end. Over 560,000 cubic metres of rock have been blasted with a contract value of £8.5million. At present they are working on a small contract blasting 50,000 cubic metres valued at £350,000 and they are in the process of tendering for other sections of the work.

The new Panama will lead to an increase in container and bulk cargo trades. This in turn will require new and larger ships to be built now designated as post Panamax, and abbreviated to NPX. With these larger ships transiting the canal between Asia and the American east coast and Atlantic ports, this will lead to new trade patterns emerging.

An acquaintance who was a chief engineer at sea during the era of steam, mentioned to me that he once did a trip with a cargo of tinned salmon from Vancouver to Montreal via the Panama Canal. It was much cheaper than transporting over land.

A book worth reading is “The Path between the Seas” by David McCulloch.
Maid Of The Loch - 
A Scottish Icon

by Phil Preston, FIES

MAID OF THE LOCH, Loch Lomond’s Paddle Steamer, is Scotland’s paddle steamer, the last of the line, and the last paddle steamer to be built in Britain.

Ordered in 1950, construction commenced in 1952 at the A&J Inglis yard in Glasgow. She was bolted together on the River Kelvin slipway, dismantled, then transported in bits to Loch Lomond, and re-assembled at Balloch on the slipway beside the pier. She was launched in March 1953, with her maiden voyage taking place on 25 May that year.

Now in her 58th year, she has been owned by the Loch Lomond Steamship Company, a charity registered in Scotland since 1996, whose aim is to return her to steam operation. For the past fourteen years, a dedicated group of volunteers have transformed the Maid from a rusting, forgotten hulk, into a visitor attraction and events venue. The charity is almost ready to launch a major appeal for funding to return her to service.

Every compartment of the steamer has been stripped back to the steelwork (or aluminium-work from the promenade deck up); primed & painted; and refurbished. The engine has been overhauled and put back together. Instead of the toilets discharging straight into the loch, there is now a vacuum system discharging into an on-board tank, and then pumped to the mains sewerage system. The pier has been rebuilt, a new access route built over the railway line, and a car park constructed.

Perhaps the greatest achievement to date has been the rebuilding of the 1902 Balloch Steam Slipway. This was the slipway upon which she was built in 1952-3, but it had fallen into disrepair. The Heritage Lottery Fund, Scottish Enterprise, West Dunbartonshire Council, and LLSC made up the £620,000 cost. The project was completed to budget and opened by HRH the Princess Royal in November 2006. Maid of the Loch was taken out of the water for the first time in over 25 years to test the carriage and slipway. Happily it was a success and the facility is now a 3 star visitor attraction open throughout the year with “In Steam” days where the volunteer engineers demonstrate how a small steam engine can pull a 555 ton paddle steamer out of the water.

The Maid had, in the main, a relatively uneventful career. She had the honour of carrying Queen Salote of Tonga in 1953; HRH Queen Elizabeth and the Duke of Edinburgh in 1965; and again in 1971 when they were also accompanied by Princess Anne. As with pleasure steamers everywhere, passenger numbers declined over the years, piers closed, costs soared, and talk of withdrawal grew. At one time, there were six paddle steamers on the loch, eight piers, and in excess of 500,000 passengers. In 1981 the Maid could only call at four piers and carried 114,000 passengers. Her last sail was on 30 August that year, and in 1982 she was put up for sale.

Apart from her unusual and distinct construction, the Maid has many unique features. She is constructed of aluminium from the promenade deck up, to reduce her draught. At an amazing 4' this allows her to navigate all parts of the loch. Her engine is a compound diagonal from Rankin & Blackmore, Greenock. It is an almost exact replica of the one they built for the Kylemore in 1897. She has four external curved companionways leading from the promenade deck up; primed & painted; and refurbished. The engine has been overhauled and put back together. Instead of the toilets discharging straight into the loch, there is now a vacuum system discharging into an on-board tank, and then pumped to the mains sewerage system. The pier has been rebuilt, a new access route built over the railway line, and a car park constructed.

The highest bidder was a brewery, and although they produced great plans for her future she gradually rusted away at the pier. A succession of private owners, each professing a bright operating future for her ended with liquidators being called in, in 1992. No money had been spent on her during these eleven years, the ship had been vandalised, and a combination of the inflicted damage and leaking decks meant she had three feet of water in the hull and was in danger of sinking at the pier. In the nick of time, swift action by volunteers and the local authority prevented a catastrophe; the council bought the ship, pier and slipway; and in 1996 handed the Maid over to the newly formed LLSC.

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The project to restore her has gone from strength to strength. Thanks to the support and commitment of the charity’s volunteers - there is no paid staff - she is in the best condition since she came out of service almost 30 years ago. Under the guidance of; first Provost Pat O’Neill of Dumbarton District Council, then Colin Paterson CBE (a former Managing Director of Caledonian MacBrayne), and now Phil Preston (the Managing Director of CalMac Ferries Ltd), the last of the line looks likely to steam again. The MCA have given approval in principle for 600 passengers; an independent economic study in 2008 demonstrated an operational Maid of the Loch would be economically viable; and a technical specification has been produced for her refit with costs of between £2.5M – £3M.

Loch Lomond needs better water transport, a way to link the lochside communities, and to offer visitors an added value experience. The government want to increase the number of visitors by 20% by 2015. The area, a National Park, needs to ensure visitors do not cause environmental problems while at the same time resolving congestion issues in towns such as Balmaha and Luss. Maid of the Loch can help to solve all these issues. All that is needed is the funding. Come and help, or find our more at the website www.maidoftheloch.com

2012 will be the 200th anniversary of the COMET, the world’s first commercially successful steamship. What a massive good news story if the last paddle steamer built in Britain could be sailing again in time to take part in the first paddle steamer’s bicentenary celebrations. MAID OF THE LOCH can be an icon for Loch Lomond, and Scotland.

The James Watt Connection - The West Coast Water Front

by Garry Williamson Implementation Manager — Riverside Inverclyde

Riverside Inverclyde was initiated a few years ago to develop and improve the amenities in Greenock and Inverclyde. The Chairman is Alf Young of the Glasgow Herald and the Chief Executive is Bill Nicol.

Riverside Inverclyde is a partnership between Peel Holdings, a leading UK property and transport company, and the operating company Clydeport. It is also in partnership with £400 million of public and private funding with Inverclyde Council, Scottish Enterprise, and the Scottish Government. The regeneration work will extend from Port Glasgow through Greenock to Gourock.

Some time ago Prince Charles commented on the condition of the listed old tobacco and sugar warehouses adjoining the James Watt Dock in Greenock, and suggested these historic warehouses be preserved brought into modern use. This is at present the major regeneration work being carried out by Riverside Inverclyde. These no longer used warehouses were in a dilapidated condition with leaking roofs, vegetation growing out of the brickwork, and pigeons in occupation. These have now been partly repaired by Riverside Inverclyde, who have plans to transform the area for better use and a brighter future. The large fitting out crane, a landmark feature to the west of the warehouses, will form a major feature to the regenerated site.

Work is in progress on a new road to give easy access to the James Watt Dock, and is being carried out by the civil engineering contractor R J McLeod. It will lead into the site from the A8, and will provide a hub for the internal roads required for the development. Traffic lights will provide for the safety and ease of entry to the James Watt Dock. This is an essential part of the work to develop the 107 acre site, where the overall development will create 1700 jobs, and provide homes, offices, retail and leisure features.

2011 will see the finish of the tall ships race at Greenock, and the James Watt Dock will host the berthing of over 80 sailing vessels and 3,500 crew members from many nations. The large fitting out crane, a landmark feature to the west of the warehouses, will form a major feature to the regenerated site.

The IESIS holds the James Watt dinner annually in remembrance of James Watt, whose statue stands near his birthplace at the corner of William Street and Dalrymple Street.

2012 will be the 200th anniversary of the COMET, the world’s first commercially successful steamship.
and at the site of the old James Watt College. In one hand he holds the steam engine indicator equipment and in the other hand holds the indicator card which he is contemplating. His "invention" of the horse power which is now the kilowatt or megawatt in daily use.

Riverside Inverclyde is now a key part of the regeneration of James Watt’s home town.

The Co-Guide Project

Engineering and Computing academics and students from Glasgow Caledonian University joined with children from schools in Glasgow’s East End to design an electronic guide to the forthcoming 2014 Commonwealth Games which comprises a DVD, website and cutting-edge mobile phone application.

The 2014 Commonwealth Games will transform Glasgow’s East End beyond all recognition and while the city’s progress towards the event is well documented there has never before been a free Layar for mobile phones that allows users to see architectural visualisations of the venues on their handsets. In addition, the “app” has futuristic as well as historical aspects — enabling the exploration of buildings that are not yet built and no longer there— and makes it possible to take physical part in some of the Glasgow Games sports “Wii-style”.

Dr. Lynne Baillie of GCU’s School of Engineering and Computing, who is leading the project, says: “Glasgow’s hosting of the Commonwealth Games presented us with a fantastic opportunity to re-examine Glasgow’s sporting heritage, but in a very high-tech way.

The Co-guide has been produced in conjunction with pupils from both Haghill Park Primary and Smithycroft Secondary schools in Glasgow’s East End and their inimitable stamp is all over the website http://copuide.mmigmobi/about/. It features a photo diary of the project’s development, as well as information on 2014 venues, sports and an overview of the Commonwealth Games movement. The website documents the project’s progress, showing the pupils undertaking research before co-designing digital artefacts and helping to test the phone app so that it responds to their movements in game in a realistic way.

Research staff at the University and senior students were involved in various site visits to the schools and this resulted in the children’s ideas and conceptual designs being prototyped by the researchers and senior (e.g. Hons level) programming and design students. These prototypes were then presented to the school children using an iterative design process which had three iterative cycles (e.g. 1st prototype conceptual shown as storyboards, 2nd prototype some but limited functionality and final evaluation level prototype). The final prototypes of the website and the mobile application were shown to the children and they were able to freely evaluate and provide feedback to the researchers and senior student designers. The benefits of the co-guide process is that the children at the two schools received real insight into the software system design lifecycle and what is required in order to build a software/technical prototype and to test the system. The result of this will be that the children involved in the project will have a greater awareness and insight into how many of the digital artefacts that surround them are designed and built. This is useful as we have found that our students when starting out on their computing or engineering degree courses have a low level of knowledge as to how something goes from being an abstract concept to a functioning system and have no or limited awareness of how such systems operate under the hood.

In conclusion the project aims to help and equip children to think of technology in a creative and practical way. In the current curriculum for schools teachers are advised to encourage children to look at “Technology” in the widest way possible and as a result technology is seen as encompassing: computing science, food, textiles, craft, design, engineering, graphics and applied technologies.

By undertaking the co-guide project we hoped to equip children in:

- developing an understanding of the role and impact of technologies in changing and influencing societies.
- gaining the confidence and skills to design, embrace and use technologies now and in the future, at home, at work and in the wider community.
- becoming an informed consumer and producer who has an appreciation of the merits and impacts of technologies, products and services
- broadening their understanding of the role that information and communications technology (ICT) has in Scotland and in the global community

Information on the project can be viewed at: http://coguide.mmigmobi/home/
Ships & Shipbuilders

Fred Walker, one of our members, has recently written a book entitled “Ships & Shipbuilders”
The book is a fascinating read and shows the design and construction of ships that have evolved over
thousands of years producing the largest most complex moveable structures ever built by mankind.

The book describes the lives and deeds of more than 130 great engineers, scientists, philosophers,
businessmen, shipwrights, naval architects and inventors who shaped ship design and shipbuilding
worldwide.

“Covering the story chronologically, it begins by going back to Archimedes of Syracuse, outlining the
Greek mathematicians role in understanding the principals of buoyancy.

Many names such as Anthony Deane, Peter the Great, James Watt, Robert Fulton and Isambard
Kingdom Brunel will already be well known to the reader. The book gives a compelling insight to their
contributions to the shipping world but also tells the reader the impact that their professional lives had
on their personal ones, which adds an extra dimension to the book, especially for those who carry an
interest in social history, and are keen to learn what it was like to live in these times.

Another interesting facet of the book is the inclusion of the lesser known characters, many of whom are
covered in just as much detail as their more famous colleagues. Like the luckless Frenchman Frederic
Sauvage, a pioneer of screw propulsion, who unable to interest the French Navy in his tests in the early
1830s, was bankrupted and landed in a debtor’s prison.

With such an in-depth read it is only right that modern names are also mentioned for their contributions.
Ben Lexcen, the Australian yacht designer who developed the controversial winged keel for the 1983
America’s Cup challenger is one of those featured in the book, bringing the story right up to date from
the days of Archimedes.

The chapters are concise, link together and describe the many factors that drove and influenced ship
design so that the individual pioneers and inventors can be seen in context of their times. Published to
coincide with the 150th anniversary of The Royal Institution of Naval Architects, this is an original and
important reference book and should be of interest to any enthusiasts as well as those who just wish to
learn more about the subject.” Stephen Haigh

Ships and Shipbuilding, Fred Walker, Seaforth Publishing £25.00
IESIS with RINA and Lloyd’s Register

Celebrations!!

In 2010 Lloyds Register celebrates its 250th anniversary and RINA celebrates its 150th anniversary.

IESIS was very proud to send its congratulations to RINA and Lloyds Register earlier this year, the Institution has a long history with both organisations

The Institution of Naval Architects was founded in 1860.
In 1877 the Institution had their first technical outing to other parts of Britain, visiting Glasgow where the meetings held jointly with the IESIS were in Corporation Halls. There were 14 papers, a visit to the John Elder (later Fairfield then Govan Shipyard) and to the shipyard of Denny of Dumbarton. There was a cruise on a Clyde steamer to the Kyles of Bute and Arran. 1960 the title Royal was given to the Institution.

Lloyd’s Register of Shipping was founded in 1760. The Technical Committee was founded in the 1890s and the first reference to IESIS involvement is in our transactions of 1897-1898 when it was reported that D J Dunlop, James Gilchrist, John Inglis and John Ward represented the IESIS.
Recently the Society renamed itself Lloyd’s Register as it was felt that the previous name of Lloyd’s Register of Shipping no longer represented the much wider interests and aspirations of the Society. Fred Walker is the current representative of IESIS on the Technical Committee.

Five papers on Lloyd’s Register are printed in the IESIS transactions:
Lloyd’s Rules for Iron Ships etc  J G Lawrie  SSA 1860-1861
Differences between Lloyd’s and Liverpool Underwriter’s Rules for Iron Ships  J Ferguson  SSA 1864-1865
Proposed Rules for Construction and Classification of Composite Ships  1865-1866

Professional Engineering Group

The objective of this group is to promote the importance of professional engineering especially to young people about to embark on a career.

The membership of this group now consists of: I MacLeod, P Preston and D Watson.
We are making arrangements to upgrade the website at: http://www.profeng.org. Contributions from members for this website would be greatly appreciated. In particular we would like to add information about projects and about engineers of all types.

A potentially useful contact has been made with Kirk Ramsay of the Glasgow Science Centre.
The Rolls-Royce Trent XWB engine

Specifically designed for the Airbus A350XWB, the Trent XWB is the most fuel-efficient and environmentally sensitive large engine design available today, it has 28 per cent better fuel efficiency than pre-Trent generation engines.

The Trent XWB is the fastest-selling Trent engine programme ever. With orders exceeding 1,000, the engine ran for first time on 17 June on a testbed in Derby, UK. The first run starts the most extensive pre-flight programme in Trent history, before the start of flight tests on an Airbus A380 testbed next year and A350 XWB flight tests in 2012. Seven development engines will be running by early 2011.

The engine’s first run meets the programme commitments set out by Rolls Royce in 2006.

Steve Horton, Functional Technical Lead in Trent XWB Development, said: “It was great to be able to see this moment from the control room of the test bed. A lot of people have worked really hard over the last couple of years to get to this point so it was a nervous moment initially that quickly became an exciting one as the engine started successfully first time.”

Mark King, Rolls-Royce President - Civil Aerospace, said: “This is another significant milestone and once again demonstrates Rolls-Royce’s track record of consistently delivering on major leading-edge technology programmes. The Trent XWB will lead the aerospace industry in terms of quality, efficiency and environmental performance.”

Programme Director Chris Cholerton commented: “It has taken considerable innovation, effort and teamwork to get to this point in the programme. An intensive testing phase lies ahead but I’d like to say a huge thank you to everybody involved in getting to this exciting milestone and meeting our customer commitment.”

Photograph: Courtesy of Rolls-Royce.
The McLean Art Gallery And Museum

15 Kelly Street, Greenock  PA16 8JX

The McLean Museum and Art Gallery is one of the best municipal museums in Scotland. The Museum has served as the main museum in the Inverclyde area since it opened in 1876 and has many wonderful collections for the visitor to discover and explore.

**James Watt Collection**
This collection includes plans and letters written by James Watt, tools and items used by him and images of him in the form of paintings, sculpture, prints and books.

**Greenock Provincial Silver**
The collection contains a wide range of pieces including teaspoons, sugar tongs, wine labels, serving trays, ladies, cups and a yachting trophy. There are pieces of undoubted quality and skill, the most important of them being John Heron's trophy for the Northern Yacht Club Challenge Race of 1828. The collection also contains pieces by Jonas Osborn, John Taylor, William Clark and Nathaniel Hunter.

**Maritime Transport Collection**
The Maritime Transport collection contains items related to all forms of maritime transport. It consists mostly of photographs of ships of all kinds but also includes objects related to the subject such as merchant navy uniforms, charts and nautical instruments. The collection is an important one for the Inverclyde area since it helps to document the many vessels that were built on the Clyde via photographs, the bulk of which are from the Paterson Collect

**Scottish Art**
The Scottish Art Collection is an important public collection of art works by Scottish artists from the eighteenth century to the present day and includes a work by almost every significant Scottish artist between 1800 and 1950. Of particular note are the groups of works by Inverclyde born artists, the Glasgow Boys and the Scottish Colourists. The collection includes Scottish prints dating from 1768 to the present day with many examples of prints made by leading Scottish printmakers and prints by Inverclyde artists.

**Forthcoming Exhibitions**
**Sea Stories**
9 October - 11 December 2010
This exhibition is devoted to paintings of the sea from the late Victorian period to the present day. It is appropriate that in this, the centenary of his death, the exhibition includes works by William McTaggart. Also included are works by acknowledged masters of the genre such as Charles Napier Hemy and Frank Mason as well as our own local favourite master of the sea, Patrick Downie

See website for further events - www.inverclyde.gov.uk, under ‘tourism and visitor attractions’

**Newsletter Group**
Kevin Frew, Laura Clow and Harry Osborn.
Progress With The M74 Completion Scheme

Transport Scotland

Work to complete the 8 km “missing link” in the motorway network around Glasgow from the existing M74 to the M8 south of the city centre is going on apace. The M74 Completion project has a fixed design and construction cost of £445 million plus an allowance of approximately £12 million for treatment of mine workings and approximately £200 million for land preparation works. It has included a number of major engineering challenges including the phased launching of the Port Eglinton Viaduct and the erection of Auchenshuggle Bridge over the River Clyde using Europe’s largest mobile crane.

The project is a partnership between Transport Scotland, the principal funder, and Glasgow City, South Lanarkshire and Renfrewshire Councils and the contractor is Interlink M74 JV, a joint venture comprising Morrison Construction, Balfour Beatty, Morgan Sindall and Sir Robert McAlpine, four of the UK’s major civil engineering contractors.

In total there are 13 major structures along the route of the new road, crossing dozens of roads, railway lines and the River Clyde. The two biggest operations, Port Eglinton Viaduct and Auchenshuggle Bridge, highlight the major engineering challenges which the project has provided.

The Port Eglinton Viaduct is the largest bridge constructed as part of the M74 Completion project. The bridge is approximately 750 metres long with 12 spans, and the longest spans had to be launched into place rather than be placed by crane due to their length. Given the added complication that the bridge had to be pulled across a number of Glasgow streets, local rail lines and the West Coast Main Line, the operation had to take place at night to avoid disruption to train services.

The Auchenshuggle Bridge is the only structure along the new road that crosses over water. The largest mobile crane in Europe was needed to erect the massive steel beams which would carry both carriageways of the new M74 over the River Clyde. The crane, which was transported in 100 lorries, took a week to build on site and the steel girders, ranging in weight from 270-330 tonnes, were transported to and assembled on the site of the works.

Commenting on the Port Eglinton Viaduct and Auchenshuggle Bridge works, Transport Scotland’s Head of Construction Graham Porteous said:

“These two complicated operations show that Scotland can still lead the way when it comes to pioneering engineering projects. The whole M74 Completion team can take great pride in successfully carrying out these complicated and highly technical jobs.

“When completed next year, the scheme will deliver a wide range of benefits including helping to promote sustainable economic growth, bringing new jobs along the route, reducing road accidents and improving the environment.”

David Welsh, Project Director of Interlink M74 JV added:

“There has always been an acute awareness on this site that we are involved in a very special project, unique in Scottish Civil Engineering, and I’m sure that this feeling has resulted in the collective desire for a successful outcome that has driven us, client, contractor and stakeholders, as one very effective project team, to the healthy position we find ourselves in today.

“I have no doubt that the same positive momentum will see us through to completion within programme and budget.”

Although the majority of the major structures along the whole of the M74 Completion project are now in place, significant work remains to be done to ensure the new road meets its programmed opening in August 2011.
An Appealing Paint For Defence

A strippable paint coating that can decontaminate itself after absorbing chemical agents is the ultimate aim for scientists at the Defence Science Technology Laboratory (Dstl).

Currently, shippable coatings are used on military vehicles in theatre to change the colour of vehicles quickly. The application of these coatings requires minimal training and can easily be applied and removed by soldiers. Ninety percent of the coatings can be removed by scoring flat areas with a knife and then manually peeling it off, complex areas can be scored and then removed with high-pressure water. The coatings also have a use in temporary camouflage as the paint can be used to flexibly adapt a vehicle’s colour and glint signature, reducing the vehicle’s visibility. The current generation of coatings have at least a 12 month life span on the vehicles.

Dstl is evaluating the coatings for use in decontamination and is researching the next generation of coatings which will be able to absorb chemical biological and radiological agents (CBR), therefore protecting those operating inside and around the vehicle. Further down the line, Dstl is looking at reactive coatings which would contain catalysts and possibly enzymes in order to create self-decontaminating coatings.

Dr Steven Mitchell, a Dstl research scientist leading the work on shippable coatings says: “Ultimately, what we’d like to create is a coating that changes colour to indicate it’s been contaminated, decontaminates itself, then returns to the original colour when it’s clean. This is a long-term but not an unreasonable ultimate objective”.

Airdrie to Bathgate Rail Link Project

On the 12th December 2010, for the first time in fifty years communities in North Lanarkshire will be linked by rail to their counter-part communities in South Lanarkshire.

After months of planning and deliberation, the final timetable for the new link has been drawn up.

Network Rail has been working with both ScotRail and Transport Scotland to create a timetable of efficient and regular services with good connections to the rest of the rail network. Four trains an hour will run on the new A-B line between Edinburgh and Glasgow. Two of these will be express trains, with Drumgelloch the only stop between Airdrie and Bathgate. The other two trains each hour will stop at all intermediate stations including Caldercruix, Armadale and Blackridge.

Over the summer months Network Rail were busy with a 200-Tonne machine on-site every day laying track at a rate of up to kilometre per day. This massive machine was able to lay 24km of track along the path from Drumgelloch to Bathgate. It also put down 14km of track between Bathgate and Blackridge. A new station was built at Armdale. The same story is true of Blackridge.

Drumgelloch station itself closed on the 9th of May with the new station opening expected in December only to the east of the old one by 500 metres. The new station will however accommodate almost 360 car parking facilities.

The health and safety aspects of the new link have been paramount throughout the entire project. This has been
particularly enforced with reference to Balfour Beatty whom are a major contractor for the link.

It has also been highly stressed throughout the link of the adverse effects that such a project may have upon neighbouring residents. For this liaisons have been made with relevant councils and environmental health officers regarding any late night and weekend working that has to be carried out for the project. Network Rail tried to only work at night in special circumstances, should they need to finish work as quickly as possible to minimise inconvenience to residents and the travelling public for instance. On these occasions, the council would grant permission on a case by case basis. Recently, Network rail used engineering trains to deliver materials to lay the new track between Bathgate and Airdrie. This was done at night once the passenger trains had finished. The effect of this action being that haulage lorries are taken from the road during the day which reduces traffic and is also more environmentally friendly.

Network rail will also be responsible for running the new stations at Caldercruix, Armadale and Blackridge, as well as the relocated stations at Drumgelloch and Bathgate. Each station has been provided with modern DDA compliant facilities with ample cycling provisions including covered cycle racks at every station.

Network Rail teamed up with the British Transport Police to attend summer events in many communities along the new route. Network rail were seen to be enjoying meeting up with the people of Armadale, Blackridge and Caldercruix at their gala days and also at the Choices for Life event in Strathclyde Park and the Nae Bother event in Airdrie. It was promising that the public journeyed to talk and find out more about the project. Network Rail will continue to work with local primary and secondary schools in West Lothian and North Lanarkshire, talking with school teachers and children about the new line and the benefits it will bring, as well as underlining how to be railway safe; part of Network Rail’s No Messin’ campaign.

The effect of the link to the general public will begin with 4 trains per hour in each direction to Glasgow and Edinburgh with over 23 colleges and universities in Glasgow and Edinburgh accessible via the service. The journey time will be 45 minutes from Bathgate to Glasgow and 48 minutes from Airdrie to Edinburgh. 1,862 car parking spaces in total across the new Stations have been created, encouraging park and ride for the 12,000 passenger journeys estimated per day.

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**James Watt Dinner 2010**

**Cementing our reputation as the friendly engineering dinner!**

This year’s James Watt dinner was held on Friday 1st October in the Glasgow Hilton Hotel. The evening was a great success, the audience thoroughly enjoyed and supported Gordon Masterton’s address, where he outlined the challenges in the future and how well equipped young engineers are to deal with those challenges, much as they had done in times of great innovation like the Industrial Revolution.

Duncan Cameron entertained the room with many hysterical anecdotes and observations.

The formal part of the evening finished at 10.30pm which left guests plenty of time to mingle and network - which they did until the ‘wee small hours’!

We were privileged to be joined by Minister for Energy, Tourism and Enterprise, Jim Mather, MSP and Bailie James McNally, Glasgow City Council (pictured below)
We are grateful for the organisational skills of Karen Dinardo, David Harrison, David Westmore, Gordon Masterton, Malcolm Reed and Laura Clow. We are also grateful to Kevin Frew and Francis Quail who prepared the information on Scottish Engineers worldwide, to Adam Harper and David Moore who provided our AV equipment and to Alan Gilmour for these photographs.
Proposal for a Scottish Museum of Industry, Science and Technology

This unique project started in June 2006, when a member of the public discovered that The Plaza Ballroom, Glasgow was both unlisted and to be demolished. Despite trying all avenues to save this sole surviving building of its type in Scotland, the Plaza Ballroom was demolished, but not before he had saved many rare and unique artefacts from there, as well as a photographic record. This was unfortunately repeated the following year with the total destruction of both Windmillcroft Quay and Clyde Place Quay. Again quite a few unique items were saved and now constituted a fairly large collection which the relevant Scottish museums (Scottish Maritime Museum, Summerlee Heritage Park and Glasgow’s Museum of Transport) were unable to take due to no space and/or resources. After consulting both historic Scotland and the Listing department of Glasgow planning department, it was decided that only the last remaining Victorian engineering works left in Glasgow was capable of housing such magnificent machines. This in itself is a reminder of how much we have lost of our industry since the early 1970’s; for only three such works are left in Scotland; one is Lamberton’s which is still in use, then the Sentinel Works which is divided between three owners. This leaves Howden Engineering works in Scotland Street, Glasgow; as the best for location. Since its buildings are all on ground level and makes it fully accessible for the general public and disabled. The next door building to the West is the famous Charles Rennie Mackintosh designed Museum of Education; and to the East and incorporated into Howden Engineering works, the world’s only Victorian Subway Power station. Despite being listed, both buildings are under immediate threat from a developer. Our Trust aims to save both buildings and restore them to their former glory as a Museum of Industry, Science and Technology - the first working industrial museum in Scotland. Our Trust would therefore hopefully save two unique buildings from demolition and with the Museum of Education next door, both museums would complement each other as well as attracting new visitors to each museum.

Museum Of Industry, Science And Technology (M.I.S.T.)

The museum would be the first of its type in Scotland, in that all exhibits will be either restored to full working condition or will have arrived that way. The museum will also incorporate the first museum of electricity, museum of computing and a museum photography in Scotland. As well as a full restoration workshop, there will be available courses for engineering apprentices, etc. This is to reverse the ever continuing decline of our famous Scottish engineering workforce; and will be run in conjunction with the Universities, etc; especially the University of Strathclyde. All aspects of Scotland’s famous industrial heritage shall be represented from the steam age to computers and beyond; and part of one of the halls will feature the latest inventions and innovations. The museum will bring back to Scotland, for the first time since the 1960s, mainline steam locomotive facilities, contained in the large Western Edwardian building. There will also be an International hall to reflect other countries contribution towards the progress of mankind. The Trust’s unique collection to date (see website), will gave a taste of what shall be displayed.

Why?

Despite Glasgow and Scotland’s great contribution to the world by manufactured goods, there is but one industrial museum in Scotland to show this history, which is run by North Lanarkshire Council - this museum is the new build called Summerlee Heritage Park in Coatbridge. This museum cannot expand as it is surrounded by housing, etc; and for many years now it has been unable to save our industrial heritage as it has no further capacity left. This is why our Trust has been able to build up such a large collection, as all items would have been scrapped and lost to history and future generations. When it comes to presenting our industrial heritage, Scotland is one of the worst countries in Europe for this. And since Glasgow was the second largest manufacturing city in Britain, it should have had an industrial museum decades ago. Ironically, it is now Forty years since the first attempt by the New Glasgow Society to set up such a museum in Tradeston, Glasgow. Within our present generation industry is fast becoming as remote as the Roman remains in Scotland. This will now be the last opportunity to open such a museum. Other famous industrial cities such as London, Birmingham, Manchester and Sheffield have superb industrial museums, set up decades ago – why not Glasgow?

Future

With your help, we shall save for future generations a prime example of what made Glasgow and Scotland world famous in all engineering fields. The museum will also create permanent jobs and also apprenticeships. The viability of the neighbouring Charles Rennie Mackintosh Museum of Education will benefit from the close proximity of another museum. If you wish to help our valiant cause, please contact the Scottish Industrial Preservation Trust.

Scottish Industrial Preservation Trust
124 Shawmoss Road, Glasgow G41 4AJ
www.sipt.co.uk
Presidential Review

by David K Harrison, FIES

The session 2008/2009 seemed to me to go by remarkably quickly. To recap we had a full lecture programme on quite diverse subjects commencing in September 2008 with my own Presidential Address where I illustrated the advances in engineering computing during my career with a particular emphasis on modelling of real world systems. From my perspective the lecture was well attended and this good start to the session was maintained throughout even during bouts of bad weather. The November lecture was given by Professor Clive Neal-Sturgess from the University of Birmingham and addressed Current Problems in Vehicle Safety. For many attendees the statistical evidence presented was a most sobering experience, however, Clive delivered the material with appropriate light hearted interjections which led to a most enjoyable evening.

The December 2008 Joint Meeting with RINA was the largest meeting that I was to organize during my Presidency with Stephen Payne, President of RINA, presenting his QE2 – a complete history lecture. For this event, timed to coincide with the QE2 retiring, it was necessary to hire the Mitchell Theatre and issue tickets culminating with just short of 400 attendees on the night.

This was followed by Crawford MacCalman giving his lecture, at the Joint meeting with IMarEST, on the British Waterways Helix Project which was held at the Glasgow College of Nautical Studies, again attendance was excellent and the planned developments of the central belt waterways over the next 10 years made fascinating listening.

For the February lecture Professor Tony Unsworth, from the University of Durham, gave his lecture on Past, Present and Future Designs of artificial human joints, an area of research in which he has had over 30 years experience including taking new designs to market. This was another lecture covering a very serious subject which was delivered with quite appropriate humorous interludes.

The 2009 Macmillan Memorial Lecture was given by Tanya Vladimirova on the Challenges of Engineering in Space. This again was very well attended and demonstrated the surprising, to me at least, level of professional interest in Space engineering which is based locally.

The April 2009 Annual General Meeting was held in the James Weir Building at Strathclyde University and was followed by Neil Sandilands and Richard Appleby illustrating the building and commissioning of the Glen Doe Hydro-Electric Power Scheme.

As we moved into the commencement of session 2009/2010 the body of work undertaken by our Energy Group had reached a position where it was appropriate to consult the membership prior to the dissemination of the Institutions view on how the future energy needs of Scotland could be resourced. Thus, Council organised a Members Meeting on the 22nd of September and Fellow Tom Douglas and our Vice President elect Professor Iain McLeod gave presentations which were then followed by debate which informed both the content and the dissemination path of the subsequent position paper which was sent to Minister Jim Mather. Following publication Iain was invited to speak on the BBC and Energy Group members have met with Government Ministers to inform future policy making. There was also an article published in the Herald highlighting the Institutional position. I would like to take this opportunity to thank the members of the Energy Group for their hard work and in the way they have raised the public profile of the Institution.

The lectures held during session 2008/2009 had been well attended and Council determined to build on this success by providing an increased number of lectures for the session 2009/2010. It was also determined that we should increase our efforts to attract greater numbers of Student Members to safeguard the long term future of the Institution. Therefore for session 2009/2010 it was decided to try a new initiative and give an additional Institution lecture within a University during the afternoon when a greater number of students would be able to attend. Thus in September 2009 the first University Lecture was held at Glasgow Caledonian University at 16-00 and I am most grateful to past Council member and Fellow of the Institution Harry Osborn for presenting his lecture on Immersed Tube Tunnels. Harry described various tunnelling techniques before going onto describe the immersed tube tunnel concept from its development early last century, as an alternative method to driven tunnels, to the present day as a practical and economic method. This form of construction of tunnels has been adopted for many crossings and Harry illustrated a number of examples. The event was very well attended particularly by the target audience and over 30 new student applications were received and I was able to see a number of these new members attending subsequent lectures. Council members Karen Dinardo and Martin Macdonald have also been particularly active over this last year in recruiting new Student Members by giving talks.
to groups of students in classes. This additional work has also resulted in applications from over 30 new Student Members which is most heartening.

In October the Marlow Lecture was presented by Professor Valentin Vitanov from the University of Durham on the subject of Autonomous Robots. The lecture was held in the Trust Hall of the Clydeport Building and covered the origins and development of autonomous robots providing a general foundation before moving onto cover the state-of-the-art in robots for both civil and military usage. Particular emphasis was given to the social enablement and mission orientation of autonomous agents as well as the prognosis for market development over the next 25 years. The lecture was amply illustrated by a wide range of applications for these devices. Once again attendance was good and the evening was very enjoyable.

This was followed in November by a lecture on Voice Synthesis held at Glasgow Caledonian University given by Professor David Howard from the University of York. Professionally, David is an Electronic Engineer but is also an accomplished Chorist and Musician and as an EPSRC Senior Media Fellow (2005-8) he presented two BBC4 television programs: Castrato and Voice. His lecture described the physiology and acoustics of normal human voice production for speech and singing with reference to their similarities and differences. It then focused on the means by which the human voice can be synthesized electronically in terms of the underlying models that are applied and their limitations. Reference was made to historical methods of mechanical and electronic means of voice synthesis as well as a speculative look at tomorrow’s systems and their possible impact on society.

In December we held our joint meeting with RINA with the speaker being Steve Austen, Head of Engineering Support for the RNLI. His topic was Engineering in the RNLI an Unique Challenge - Composites and the Hull Selection for FCB2. The Royal National Lifeboat Institution provides a lifeboat service out to 100 miles from the coast of the United Kingdom and Republic of Ireland in all weathers. The charity’s volunteer crews operate a range of boats and equipment to cope with the variety of conditions encountered, from soft mud to steep shingle banks and from flooded rivers to fully developed storms. In a highly visual presentation, Steve described the construction materials, equipment and evaluation processes used in the selection and development of its prototype fast carriage boat and launching system. He also highlighted some other recent RNLI technical developments. For this lecture we returned to the McCance Lecture Theatre at Strathclyde University and there was a very good attendance complete with representatives of the RNLI manning a Stand.

The Joint meeting with IMarEST was this year given by Past President of the IESIS, Ian Broadley whose chosen topic was “Building QE2 - and other Tales of the Riverbank”. Ian’s paper was an eye witness account of what was perhaps the last major undertaking of the “Clyde Built” industry in its traditional and freely evolved form – building QE2. The achievement was not celebrated at the time because of the lateness and technical problems surrounding her completion and handover – and of course no one could predict the forty years of fine service that lay ahead for this much loved vessel. Ian examined the events leading to sea trials, machinery problems and finally to her controversial completion at Southampton. His lecture was profusely illustrated by depictions from the archives of Glasgow University and Dunbartonshire County Council and also from private collections. Ian also recalled a number of tales of the yard and of these historic times. Held in the McCance Lecture I regrettably had to bring the very lively debate which followed to a close so that we could honour our room hire contract.

Our February meeting was again held at the University of Strathclyde and the lecture entitled “Engineering, energy and the environment: the long view” was given by Professor Colin McInnes of the same University. Colin showed that the growing availability of low cost energy since the industrial revolution has been an overwhelmingly civilising and liberating influence. By largely mechanising food production, replacing carbohydrate fuelled farm labour with hydrocarbon fuelled machines, many of us have been freed from subsistence agriculture to think, innovate and create. His lecture addressed three important, but strongly coupled questions for the 21st century engineer: how can we ensure continued technical innovation, how can we expand the production of low cost energy and how can we continually de-couple human needs from the natural environment? He argued that the challenges of the 21st century can be met not by regressing to a low energy, low ambition society, but by accelerating technical innovation to deliver a resilient, economically and culturally rich global society of shared prosperity which can flourish into the future. This lecture offered particular intellectual stimulation for members of our Energy Group who at this time of year were very much active with their preparations for Ministerial interaction.

In March we returned to the Trust Hall in the Clydeport Building where our speaker was IESIS Fellow Graeme Forsyth who spoke on the topic of ‘New York’s Outer Harbor Gateway – a concept for surge flood defence’. New York is one of the world’s major cities and is vulnerable to surge flooding. As background to the discussions on this potential risk, the mechanism for surge flooding was described and examples of past floods and their outcomes were presented. The potential risk to the City of New York was examined using historical data and analysis by US federal, state and academic specialists. The threat to New York has caused concern among the local engineering community, which led to an ASCE backed conference of researchers and engineers to examine the issues and the potential for solutions. Invited to participate, Halcrow developed and presented a concept design of a flood defence barrier, based on their work on the St Petersburg Barrier. This concept design for the New York Outer Harbor Gateway was described. In providing protection, it crosses a 5 mile length of the harbour as a causeway, utilizes berms to reinforce existing land features and incorporates a number of large gates and sluices to accommodate ship navigation and water movements. The design requirements, options and selection of the gates, sluices, causeway and berms were
discussed and images of the St Petersburg Barrier were used to illustrate the scale and operation of the potential New York Barrier. Graeme rounded off with a view of the comparative costs and timescales for the barrier construction.

April 2010 saw the Annual General Meeting & Macmillan Memorial Lecture being held in the McCance Lecture Theatre where the lecture was given by Professor Tim Baines of Cranfield University. He spoke on the practical challenges of delivering a product-service system during his lecture entitled “Organising for services and productivity at Caterpillar, USA”. He was able to draw particular relevance from a recent six month study tour of the USA in concert with the Caterpillar Company. He described the broad range of services which an original equipment manufacturer, such as Caterpillar, can offer to the market via geographically disparate and particular industry focused Agents. He also explored the relationship between the risks and revenues for these services which inform the motivation to offer more advanced services. Tim also outlined some of the principal technologies and practices that are so critical to success. This included Caterpillar maintaining a record of the movements of earth moving equipment via GPS and operating parameters being monitored via real time telemetry. He concluded by presenting some of the broader challenges that face UK manufacturers when attempting to compete through services and he outlined current research that is tackling these issues. This lecture demonstrated that in the global economy unique selling points are often created by services which come with the product rather than the product winning orders based on quality and reputation as has often been the case in the past.

As an additional lecture in May our Vice President elect Professor Iain McLeod had secured the services of noted French engineer, Michel Virlogeux, to present two lectures to the Institution, in the afternoon it was intended that he deliver an inspirational lecture to young people entitled “Bridges and Bridge Engineers”. This would be open to secondary schools and universities. Then in the evening Michel would deliver a lecture discussing the multi-disciplinary approach of Engineers in “The Design of Long Span bridges”. These lectures were fully organised and then had to be cancelled on the day as they coincided with the Icelandic Volcano explosion which grounded all UK flights and hence prevented our speaker arriving in Glasgow. Plans are currently in hand to include these lectures in the schedule for the coming session.

Looking back over my time as President I am pleased that we are seeing a growth in applications for membership and also the good number of attendees at our evening lectures which is inspiring for both the speakers and also our Secretary, Laura Clow, and the Council Members who do so much of the organisation right through to setting the room up on the night. To hold office in the Institution has been a great honour and I was particularly privileged to be the Vice President during our 150th Anniversary and also to be the President on the occasion of the 100th James Watt Dinner. I believe the Institution is continuing its tradition of providing a learned society function for the membership and is disseminating knowledge to the wider public thus highlighting the contribution of engineering in facilitating today's standard of living. Finally, I wish to publicly thank our Secretary, our Accountant, our Financial Adviser and Council Members for their support during my Presidency and to my successor, Gordon Masterton, I offer my support and best wishes for his term of office.

**Anniversary of Henry Bell’s Comet**

2012 will be the 200th anniversary of the first ever commercial passenger steam transport in Europe.

In 1812 Henry Bell inaugurated a service between Greenock, Glasgow and Helensburgh on board his pioneering steam-powered vessel the ‘Comet’. The service was later expanded to run between Oban and Fort William. Although the service was technically advanced for its time, it was not commercially successful. Mr Bell died in poverty. Members will be interested to learn that in the 1930s the Institution commissioned a headstone to mark Henry Bell’s grave as a small recognition of his contribution to engineering.

The original engine was salvaged and is now in the Science Museum, London. The salvaged engine from the second, ill-fated Comet, can be seen at the Clydebuilt Museum. A full size replica of the Comet, constructed for 150th anniversary in 1962 by shipyard apprentices, is installed at Port Glasgow. As part of the 200th celebrations this model will be ‘spruced up’ and will be on show in Civic Square, Port Glasgow.
IESIS Membership offers the following:-

The opportunity to:

- Convey to the general public, opinion formers, governments and others, the vital importance of Engineers to society and the environment, and the need for training and building up again a manufacturing base in the UK, and the contribution to wealth creation by Engineers, all of which are particularly important in this current economic climate, going forward.

- Create an environment for Engineers and other professionals to express their views on matters of general technological interest.

- Provide opportunities for discussion of common aspects with colleagues in their own and other disciplines.

- Broaden one’s outlook on multi disciplinary engineering matters, via evening presentations, etc., etc.

and the benefits include:

- Regular meetings with fellow members and dissemination of papers and the vast history of Transactions on a wide range of subjects, including non-technical subjects relevant to engineering.

- Networking with fellow members to share experience and provide professional advice to those seeking technical solutions– and enjoy the social aspects, meet and form firm friendships for life.

- The annual James Watt Dinner, one of the most important events in the Scottish Engineering calendar. We hope our guests may be interested to join the Institution and participate in IESIS. Membership forms are included in the Dinner booklet.

- The Macmillan Memorial and Marlow Lectures, at which speakers of national standing present informative and sometimes controversial views on matters of current interest.

- Free access - to Glasgow University libraries.

Existing members all play a part in the future of the Institution – our Institution, and with small input from all, the Institution will have growth and fresh life injected, on an ongoing basis.

Let’s all give membership initiatives our support.

If anyone is in or knows an organisation that would welcome a short visit and IESIS presentation, linked to a general engineering theme, do please contact Karen Dinardo, Council Member (Tel: 0141 889 1212 / Email: paisley@dinardo.co.uk) who will arrange this.

For general enquiries on membership, contact Laura Clow, IESIS Secretary (Tel: 0141 248 3721 / Email: Secretary@iesis.org

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