

Maximising Performance: More for Less

by Claire Porter

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It's a great privilege to be here as your President tonight and to be the first woman to be in this position. I hope that it's less than 99 years before we see the next woman President! In preparing for tonight, I thought it might be useful if I share a little of my own background with you – and highlight some of the events which have shaped my perspective.

I was lucky enough to grow up in a household where it was considered completely normal to have electronics in bits all over the kitchen table. My Father wasn't a professional engineer, but had spent his national service time in the Air Force as a Radar technician, he loved to build hi-fi and repair TVs. When I came home and told my Father that Physics was too difficult and all my friends were giving up. He persuaded me to continue and patiently taught me from his Air Force text books, to make sure that I was successful.

As a teenager, I developed an interest in Stage Lighting and had my sights set on working for the BBC or in the theatre. I thought an electrical engineering degree would help and wanted to be sponsored through University, both for the experience and the obvious financial benefit at the time. I went to interviews with a number of companies, including British Rail which wasn't exactly my first choice, and I was somewhat reluctant to go to the interview. I was really lucky that I met Brian Heard, who later became a President of the IRSE. Brian was such an encouraging enthusiastic individual, that within a 45 minute interview, he'd managed to persuade me that railway signalling was a really exciting career, and I'd have an absolutely great time with BR. I was offered several jobs in the end, and I chose to work for BR.

After my degree, I went back to work for British Rail as a Telecom Engineer in the South Western area. These roles gave me my first experiences of managing a team at an early age. By the time I was 30, Brian reappeared and tried to persuade me to take a job in signalling. I eventually gave

in and progressed to being Tester in Charge for the Class 92 locomotives on-board signalling systems. I was fortunate enough to be testing from the early days of Factory testing, through to on-site trials in France and for the final testing in the Channel Tunnel. This gave me a good insight into introducing ATP and on-board systems in the UK. It also taught me how to adapt traditional rules and procedures for a new environment.

After the 92s went into commercial service, I started to look for a new challenge. I had included a management option in my engineering course. We studied commercial areas and it was at this time that the wider aspects of an engineering business began to interest me more. British Rail provided the opportunity for me to study for an MBA at Ashridge. By this time privatisation was in full swing and I then moved to Alstom, who generously supported the latter half of the MBA. Alstom provided my first experiences of being on the "other side of the fence" as a supplier and I joined the Business Development team. I also began to learn about the differences between mainline and metro, while working with London Underground.

I later joined Racal, which in due course became Thales, spending 7 years as the Account Director for the Connect project with London Underground. After this, I spent some time in business development, both in the USA and Australia before moving back to the UK to take up the role of Head of Strategy for the Thales transportation business in the UK.

I started talking by telling you about my struggles at the age of 13 with Physics for a reason. Sadly even today, only 22% of girls in the UK take A level physics, which is often a pre-requisite to an engineering degree. I strongly believe that if we are really serious about getting not only more women but more young people into engineering careers – we have to start early.

I know that without my Father's and Brian's influence, I'm sure I would be doing something else today. What they had

in common was a tremendous belief that engineering was a great career and they took the time and had the patience to guide me. I have really enjoyed my career to date and am extremely thankful to them for this.

The IRSE must play its part in encouraging more young people into the engineering profession. As a small Institution, this is an area where it is important that we collaborate with other organisations to have an influence. For the last three years, the IRSE has worked with EngineeringUK to sponsor the "Big Bang" Science and Engineering Fair. The 2010 event was attended by over 22,000 young people, parents and teachers. Two thirds of secondary school pupils saw engineering careers in a more positive light as a result of attending. More of this please ! I hope that you have, and will take up, opportunities to encourage young people.

Moving on to 2011/2012; this year the focus of the IRSE programme will be on Maximising Performance – More for Less. We will take this theme in a wide context and look at it from several angles.

Firstly for our Members – how can they use the IRSE to maximise their own personal performance in a changing environment – what competencies do they need?

Secondly for the IRSE – how can we maximise the benefit to our members? How can we best achieve our objectives of advancing signalling and telecommunications engineering?

Thirdly for Industry – how can signalling and control engineers maximise railway performance through application of technology.

THE IRSE

I joined the IRSE in 1985 and started to participate in the late 1980s, first as Secretary for Aspect 91, then going on to Chair the Aspect committee in 1999. A colleague recently asked what I had gained from this participation?

I have learned that just by giving a little, a lot could be gained in terms of interesting technical content, key business contacts, stimulating debate and of course friendship.

The IRSE has changed a lot since I joined Council in 1997, but it is still an organisation which moves forward primarily because individual members contribute. Some of them an amazing amount of time! It is for this reason that I am particularly proud, to be here as your President tonight.

As you will have worked out from my background, I enjoy the opportunity to work overseas and meet people from a wide range of cultures and backgrounds. Among the professional engineering institutions based in the UK, the IRSE is unusual in having such a high percentage of international members. The Institution has been like this for a very long time, as far back as 1920, the annual report notes that

"the branch of the section in the Argentine is flourishing exceedingly; a number of meetings of the local section have been held at which papers have been read".

It is this international perspective that makes the IRSE unique for me. We must capitalise on this more. IRSE members around the globe have fantastic experience to share, from a variety of different environments and backgrounds. Let's encourage the international debate and exchange of ideas.

The donations from Frank Hewlett and Alan's Fisher's fund enabled us to sponsor 9 young members to attend the

convention in India this year. They were selected on a world-wide basis, so we had younger members from Brazil, India, Australia, Singapore, Switzerland and the UK. It was great to see them form a network, learn and enjoy each other's company.

We had a thank you letter from one of the delegates, which I have with me, and I'd just like to read you an extract:

"I appreciate (the) IRSE initiative for this innovative thought to sponsor the young signal engineers.... I have realised many things during this IRSE convention, which I am happy to share with you. It was all outside my imagination and my expectation. I appreciate IRSE role in bringing all engineers together. I feel strongly that the young engineers should now take this industry further ahead and it's very important that young signal engineers attend this kind of convention"

The IRSE was incorporated on the 3rd December 1912, so next year will be our centenary. Plans are now underway, led by Francis How for this very special year.

We have heard a lot in the last year about the need for change in the IRSE and the strategic plans for 2011-2014. We have set three key strategic objectives:

1. Membership Growth
2. Improving Global Reach
3. Making the Institution more relevant to the Railway Sector

As Winston Churchill once remarked:

"However, beautiful the strategy, you should occasionally look at the results..."

I believe that having set the Vision, it's time for us to get on with delivering the results. So you won't be seeing any major revelations from me in terms of strategy, this year. What I hope you will see is a technical programme which interests and engages you and an IRSE delivering the strategy it has set out.

In his address last year, Paul Jenkins described our strategy for 2011-2014. I'd like to give you an update on our recent progress and talk a little from my perspective.

MEMBERSHIP GROWTH

During the last ten years IRSE membership has grown by over 50% from just over 3,000 members at the end of 2000 to 4700 now. This growth can be attributed to two main reasons. Firstly, the 2003 initiative to increase the number of Accredited Technicians, and, secondly an increase in Non-UK members, from just over 1000 in 2000 to almost 2000 now.

The local sections in Australasia, Hong Kong, India and the Netherlands have over 100 Members. The local sections in North America, Southern Africa and Singapore have 40 -100 members. It seems logical that potential IRSE members should be present where there are extensive railway networks or strong railway investment. Looking at size of network on a worldwide basis would lead to conclusions that there are many potential members in China, Russia and the USA. Looking at forecasts of investment growth towards 2015, would lead to conclusions that there are many potential members in the USA, China, India, South America the Middle East and Asia/ Pacific.

If we look at the major signalling manufacturer's activities, we see in the last year, that many have entered into strategic relationships with Chinese companies. As well as objectives to develop business in China, some of these

agreements include jointly working to address international markets.

The market for railway signalling is predominantly an international market, if the IRSE really want to grow its membership there are some key decisions to be taken in the next few years about where and how.

There are of course many challenges to be overcome, not least of course, language and finances. In many parts of the world, including China and India the IRSE subscription is very substantial when it is compared to average earnings.

The new section in India has done very well to increase their membership to over 400. During 2011/12, we will work with the section in Hong Kong, to look at the options for increasing IRSE membership in China.

Plans have also been put together for a new Swiss section of the IRSE and I hope to be in Switzerland next month to celebrate the inception of the new section with them.

In recent years we have regularly surveyed IRSE members to see how satisfied they are with the IRSE. Of course this is important, but we also need to understand why people don't join the IRSE and what we could do to encourage them. We are in the process of conducting a survey of non-members, to understand why people don't join the IRSE and what we can do to attract more members. All Council members, Country Vice Presidents and Section Chairmen are helping us to identify potential members and really understand why they haven't joined the IRSE.

IMPROVING GLOBAL REACH

During 2010/11 we have made a number of changes, including inviting more feedback and participation from Country Vice Presidents and Section Chairmen. This will continue this year. IRSE News now has an Editor in Australia and plans to include other Editors around the world, in order to present more balanced international content. I hope that we will begin to see themed editions of the IRSE News with international debate about a topic.

We have introduced IRSE on-line and in 2010 members had the opportunity to pay subscriptions and order publications via the web. Supported by the Australasian section we have followed their lead in making IRSE News, papers and presentations available on line through the members' area of the website. In 2011 the web site will be developed further to improve navigation, give sections the opportunity to update their own pages, provide the infrastructure for discussion forums and make synopses of IRSE papers searchable.

We started a review of the membership package and funding mechanisms in 2010, to look closely at how member's subscriptions are spent and whether this constitutes good value for money for all of our members. This has included a review with the sections to ensure that they are appropriately funded to deliver services to members locally. In addition, approximately 10% of our members live in a location where there is no local section, so they must also receive value for money from their subscriptions.

This work is still progressing, guided by Council and will be concluded in the Autumn of 2011. We are discussing the option of introducing a new e-membership, where for a reduced subscription rate, members could elect to receive IRSE material, electronically. This will involve making some key changes to the IRSE's infrastructure and support services. These changes will move us towards making lower

costs subscriptions available across the world and hopefully encourage more younger people to join the IRSE.

RELEVANCE OF THE INSTITUTION TO THE RAILWAY SECTOR

During the year meetings have been held with a number of industry stakeholders to seek their views of the IRSE. The feedback highlighted the need for the IRSE to be an organisation that is looking to the future and helping its members to understand and gain maximum benefit from new technology. In particular, the industry stakeholders wanted help from the IRSE during times of change, for example in helping members move from traditional signalling competencies to working in the on-board environment with ERTMS or CBTC.

The licensing scheme was a topic of much discussion, with many still considering that the scheme had a vital role to play, but some feeling that more flexibility could assist industry. As a consequence we are in the process of launching a strategic review of the scheme.

We are developing a Company Affiliation scheme, with the objective of developing closer relationships between the IRSE and industry. Draft proposals are currently being consulted with the sections and we hope to see this scheme implemented in 2011.

If the IRSE is to remain relevant to the railway sector it needs to be able to anticipate the changes in the sector and respond better. I'd like to move onto talking about some of the factors which I think will influence the sector and explain how the programme in 2011/2012 will address these.

CHANGES IN THE ENVIRONMENT MAJOR CITIES

Recent years have seen a trend towards urbanisation with more than half the world's people now living in cities. There are currently 26 cities with over 10 Million inhabitants. The largest City in the world now has over 34 Million inhabitants. It's difficult to imagine that many people, it's the equivalent of London, Paris and Washington combined.

By 2050 the UN are forecasting that 70% of the world will be urban dwellers. Mega Cities are forecast to grow into Mega regions as the cities sprawl into one another.

Recent years have seen significant investment in metros and commuter rail operations in these cities with many more schemes in the planning process, proceeding to construction now. In Asia/ Pacific and Africa/Middle East only a minority of major cities have mass transit systems. The UNIFE World Rail Market Study: Status Quo and Outlook 2020 shows the potential for 268 new urban rail systems in these regions.

Maximising the performance of the railway infrastructure in these major cities and between the cities will be a challenge for our members in years to come. I believe that the boundaries between mainline and urban technologies will begin to blur as both sectors move towards on-board systems and focus on the challenge to maximise the capacity of their infrastructure. During the year we will have two technical papers in this area. The first will be about the Thameslink project in London and discuss the issues of ATO with ETCS. The second will be about Crossrail in London and the RER in Paris and will include the CBTC or ETCS debate. They will both address the issue of maximising capacity through major cities.

We are fortunate to be able to visit Singapore and Kuala

Lumpur as part of this year's convention. Singapore has the challenge of supporting a growing population of over 5 Million within a very limited land area of 43Km by 23Km. The LTA MasterPlan, published in 2008, set out a vision for 2020 that included investments of over \$20Billion and doubling the rapid transit system from 138Km to 278Km. These plans are now well underway and we will have the opportunity to visit many of the new developments during the convention.

Back in 2007, Alan Fisher talked of a two centre convention in Kuala Lumpur and Thailand, with a train journey between the two. This was a great idea until the train timetable was checked! As a result we went to Thailand and plans for Kuala Lumpur waited for another day. We now have the opportunity to visit Malaysia as part of the 2011 convention, travelling by train from Singapore. We will see the contrast between the two cultures and railway environments and visit mainline rail installations in Malaysia as well as seeing urban signalling in Kuala Lumpur.

HIGH SPEED DATA

Access to mobile networks is now available to over 90% of the world's population. People are moving rapidly from 2G to 3G and smart phones are becoming increasingly popular. SMS traffic tripled worldwide from 2007 to 2010, with close to 300 000 text messages being sent every second. Mobile broadband usage has increased dramatically with video streaming, social networking sites and VoIP taking more bandwidth.

So for how much longer will rail passengers tolerate either no connectivity or poor connectivity during a rail journey?

The mobile telcom industry is now moving towards the next generation of networks beyond 3G, called LTE (Long Term Evolution). The idea is that by making the use of spectrum more efficient, LTE can enable affordable mass market broadband communications.

I'm delighted that Huawei have agreed to join us this year for one of the evening papers to brief us on LTE and to share with us some of the experiences they have had in China testing LTE on the new High Speed Rail network.

MAXIMISING BUSINESS RETURN

Competition for public financing is fierce, with the transport sector competing with education, health services etc. In many parts of the world, such as the US and UK, the economic downturn has focused attention strongly on gaining maximum value for money from existing infrastructure. This raises issues such as how availability and capacity can be optimised.

We will present a paper this year about how Traffic Management Systems can be used to maximise the performance of the railway system, looking at a country where these systems have already been implemented. We will also invite discussion about signalling and control delivering a high availability railway network.

A seminar will be held in London to address the issue of Maximising Business Performance through Signalling and Telecommunications. Both operators and engineers will discuss their objectives and visions for the future.

ON-BOARD SYSTEMS

The IRSE has presented many papers on ERTMS and CBTC deployment in recent years. CBTC is now operational in many cities and over 40,000Km of track has ERTMS either contracted or deployed, with almost half of this outside of Europe. The largest deployments of ERTMS are currently reported to be in China (5,862Km) and Spain (4,862Km).

Both systems represent challenges in terms of adopting new technology and working with the signalling system in an on-board environment.

In recent years, we have been fortunate to visit ERTMS installations in Switzerland, the Netherlands and Spain. The IRSE members in those areas were open and honest in exchanging views about their practical experience of deployment.

Many IRSE members are in countries where the first steps are being taken in terms of ERTMS and CBTC deployment, for example in the UK, India and Australia. So how can the IRSE help in 2011?

A new ERTMS text book was published at the beginning of 2011 and there will be a one day seminar in London on ERTMS. The papers from this conference will be shared via the web site with all members. Speakers from countries with deployment experience will talk about the technical and organisational issues they encountered, addressing the practicalities of operating and maintaining an on-board system. Following the success of the CBTC seminar in London this February, we will also have a technical visit to the Jubilee Line to see how CBTC has been implemented in London.

CYBER SECURITY

In early January 2008 we saw press reports of a 14 year old boy in Poland hacking into a City's tram system and using it as a giant train set. The incident caused chaos, injured 12 passengers and derailed four vehicles. Last year we saw reports of Iran's nuclear programme being subject to Cyber attack by the Stuxnet.worm. This has been described as a "game changer" the expert that discovered it, described it "like the arrival of an F35 into a World War 1 battlefield". Last year the US also appointed the first cyber warfare General.

Our railway control systems are becoming ever more sophisticated and increasingly using COTS off the shelf IP enabled technology. So should be we concerned? I personally believe that we should start to discuss and understand these issues now.

CONCLUSION

I am very thankful to the many people that have supported me in my IRSE activities over the years. In particular, I would like to thank Thales for their tolerance in terms of my time and their generosity in terms of ideas and financial support as well as of course my family for their patience and encouragement.

I hope that you will participate in and benefit from many of the activities we have planned for this year.

Claire Porter, President IRSE
15 April 2011