



## The Institution of Railway Signal Engineers

### Proceedings for the year 2016 to 2017

- Chapter 1      **Introduction and Summary of the year 2016 to 2017**
- Chapter 2      **Annual Report and Consolidated Accounts for the year 2016**
- Chapter 3      **Index to IRSE NEWS from May 2016 to April 2017**
- Chapter 4      **2016 to 2017 Presidential Programme – Summaries of Papers presented at Technical Meetings in Hong Kong and London**
- 26 August 2016: 'The evolution of signalling technologies in Hong Kong'.
- 9 November 2016: 'Implementation of risk-based rail asset management: a case study'.
- 6 December 2016: 'Resignalling the East Rail Line in Hong Kong: technical challenges and solutions'.
- 10 January 2017: 'Low cost signalling'.
- 8 February 2017: 'Automated testing of interlockings'.
- 14 March 2017: 'ERTMS Level 3: the game-changer'.
- Chapter 5      **Results of the IRSE Examinations held in October 2016**
- Chapter 6      **Reports from Local Sections outside the UK:**
- Australasia.
- Southern Africa.
- Thailand.
- Ireland.
- France.
- Singapore.
- Malaysia.
- Netherlands.
- North America.
- Switzerland.
- China.
- India.
- Indonesia.
- Hong Kong.



**Chapter 7      Reports from Local Section in the UK:**

Midland and North-Western Section.

Minor Railways Section.

Plymouth Section.

Scottish Section.

Western Section.

Younger Members' Section.

York Section.

**Chapter 8      IRSE NEWS issues 222 (May 2016) to 232 (April 2017)**

IRSE NEWS 222 May 2016

IRSE NEWS 223 June 2016

IRSE NEWS 224 July/August 2016

IRSE NEWS 225 September 2016

IRSE NEWS 226 October 2016

IRSE NEWS 227 November 2016

IRSE NEWS 228 December 2016

IRSE NEWS 229 January 2017

IRSE NEWS 230 February 2017

IRSE NEWS 231 March 2017

IRSE NEWS 232 April 2017



## **IRSE Proceedings 2016-17: A summary of the year**

The IRSE's Presidential Year started in April 2016 with the election of our new President, Charles Page, at the Annual General Meeting held in London on Friday 22<sup>nd</sup> April. Charles was the Business Development Manager of Siemens Rail Automation Australia. His theme for the year was "Inform, Discuss, Develop", a reminder of the IRSE's purpose in helping to develop the knowledge and skills of those wishing to work in the rail industry.

Progress in delivering the Institution's Strategy 2015-2020 was a major area of focus for the governing Council during the year, and Charles placed particular emphasis on the importance of Local Sections in providing benefits for members around the world.

The Annual Convention took place in Beijing in October 2016, during which the China Section of the IRSE was officially inaugurated. It was not the only new Section in 2016, with IRSE members in Thailand also inaugurating a new Local Section, bringing the total to 19.

Other events during included a Systems Engineering Seminar in Birmingham UK (April 2016, run jointly with INCOSE), a Seminar in Malaysia (October 2016), a CBTC Seminar in Toronto (December 2016), an ATO Seminar in London (February 2017, run jointly with the Institution of Mechanical Engineers), and innumerable Local Section meetings at various locations around the world.

Francis How continued to serve as the new Chief Executive of the IRSE, supported by the London-based IRSE staff, which included the addition of Karen Boyd as the new Deputy Licensing Registrar and Judith Ward as the new Professional Development Manager. During the year the IRSE's new membership and licensing database (CRM) was commissioned.

For a second successive year we saw extraordinarily high numbers of people taking the IRSE Examination in October 2016, and although the results were an improvement on 2015, the Education and Professional Development Committee continued work on ways of improving the pass rate without compromising the high standard of the Exam. We introduced a new Award, the IRSE-Signet Award, for the Exam candidate obtaining the highest marks in any single module of the Exam during the year.

Membership of the Institution remained more or less static at around 5,400 members, and we saw a growing number of people seeking registration with the UK's Engineering Council as Chartered Engineers, Incorporated Engineers and Engineering Technicians.

Francis How  
Chief Executive, IRSE  
August 2017

1 January to 31 December 2016



# Contents

This Annual Report briefly describes the activities undertaken by the Institution of Railway Signal Engineers (IRSE) throughout the world during 2016. Our President from April 2016 has been Charles Page, Siemens Business Development Director for the Asia Pacific Region.

An introduction from our President	3
Objectives of the Institution	4
Our Strategy	4
Governance	5
Supporting Professional Development	6
Membership and registration	6
Awards	7
Licensing	8
Presidential programme	8
London office and personnel	9
Section Activities	9
Younger Members	10
Annual General Meeting 2016	10
Annual Dinner	11
Members' lunch	11
Seminars and technical visits	11
International Technical Convention	12
International Technical Committee	12
Publications and communications	13
IT systems	13
Collaboration with other organisations	14
Finances	14
IRSE Consolidated Accounts	15
The IRSE in numbers	20

© Institution of Railway Signal Engineers 2017.  
All rights reserved.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means without the permission in writing of the publisher. Copying of articles is not permitted except for personal and internal use. Multiple copying of the content of this publication without permission is always illegal.

For up to date information about the Institution or its activities, or to download a membership application form, log on to the IRSE Web Site: [www.irse.org](http://www.irse.org).

Follow us on Twitter [@IRSEHQ](https://twitter.com/IRSEHQ)

#### London Office

IRSE, 4th Floor, 1 Birdcage Walk, Westminster, London, SW1H 9JJ, United Kingdom

# An introduction from our President

Every President has a responsibility to take the current IRSE Strategy and look for ways to move it forward. I have been particularly fortunate as our Strategy is rich in topics close to my heart. It speaks of the international nature of the Institution, and the need to serve our members equally regardless of where they live. It also draws us back to our core purpose, to help build the knowledge and skills of those wishing to work in our industry.



My theme for the year was therefore built around “*Inform, Discuss, Develop*”, based on a belief that the key value that the IRSE brings is to provide a forum to foster the professional development of its members. It provides opportunities for members, and hopefully soon-to-be members, to be exposed to the latest topics, trends and technology in our industry in an environment where they can ask questions, build their understanding and become better practitioners because of it.

One way to do that is to develop a high quality, relevant and interesting program of technical papers to be delivered as part of the flagship Presidential Papers series. This year we have seen excellent papers on some of the industry's most pressing topics. We have covered Chinese signalling, best practices in Asset Management, CBTC (with a paper and via the seminar in Toronto), advances in Modular (low cost) signalling, automated testing of interlocking data and the elusive ERTMS Level 3. The paper on Chinese signalling was delivered in Hong Kong, the first time a Presidential series paper has been delivered outside of the UK and hopefully the first of many to bring the IRSE closer to its membership around the world.

One of the great privileges of being the President of the Institution is the opportunity to meet so many members. It is also one of the challenges, particularly when you are based in a relatively remote corner of the world. Many years of attending Council meetings mainly by less than perfect telephone and video conference links in the small hours of the morning taught me to expect that much. However, as President the time commitment and travel travelling costs are significant so I am particularly grateful to my employer, Siemens, who have generously supported me throughout.

I have therefore tried to visit as many local Sections as possible, to encourage and connect with them. As I am based in Melbourne, Australia I have had a particular focus on the Sections furthest from Europe who are therefore less regularly visited by a President of the Institution. I was fortunate to visit local Sections in Malaysia, Thailand, Singapore, Hong Kong, South Africa, China, Canada and of course at home in Australia. I also managed to visit the Scottish and York Sections in the UK.

My visit to Thailand allowed me to participate in the inaugural meeting of their newly formed Section, a great honour and a pleasure. I was particularly struck by the number of younger engineers involved, surely a good omen for the future. My visit to China coincided with the International Technical Convention in Beijing. It also marked the inaugural meeting of the new China Section. This has been in the planning stages for several years and it is a testament to the hard work of the local committee in the face of complex country-specific regulations governing links with organisations such as the IRSE. As for the Convention itself, the local organising committee did an outstanding job. We were given access to the very latest technologies in both main line and metro, and we enjoyed some of the best in culture, scenery and hospitality.

I was also fortunate to be able to attend the very successful CBTC seminar in Toronto, followed by site visit and a local meeting of the North American Section. Any event that is inundated by bookings and has to expand the venue is a strong indication that it is well targeted to the needs of the industry. The quality of papers and the associated site visit justified that expectation.

My aim of these visits was to encourage the Sections to continue their good work. I have tried to highlight the international nature of the IRSE, and the work of other Sections. We are a global industry using largely global technologies to solve local problems. A key message is therefore that members in other Sections are interested in what you are doing, and what they are doing is of use to you. Making the papers and presentations delivered in local Sections around the world accessible to every member regardless of their location is another strand of the IRSE Strategy that we continue to work on.

I also gathered feedback on the work of the Institution; on how well the IRSE is meeting the needs of our members and what we could do better. Every Section is different but there were common themes. In particular, there is a consistent need to fill the skills gap, to find even better ways of developing the competency of those new to the industry. This is core to the mission of the IRSE and so it also features strongly in our strategy. The good news is that are already committed to investing more in this area to stay effective and relevant to the needs of the industry.

The IRSE has done so much more this year than the events I have been able to attend. I was particularly sorry to miss the highly successful Main line ATO seminar in London (early in 2017) that addressed this important and emerging topic. However, around the world there have been hundreds of events both large and small that have been organised by members to meet their local needs. That is one of the reasons why a relatively small Professional Engineering Institution like the IRSE is surprisingly influential, widely recognised and respected. That is only made possible through the hard work, imagination and willingness of members to share knowledge in so many different ways. The enthusiasm and commitment of our members that I have seen this year makes me confident that this success will continue as we find even better ways to Inform, Discuss and Develop.

**Charles Page, IRSE President, 2016-17**

# Objectives of the Institution

The Institution's objectives are written in our Articles of Association and can be traced back to the formation of the Institution in 1912. They are:

- The advancement for the public benefit of the science and practice of signalling by the promotion of research, the collection and publication of educational material and the holding of conferences, seminars and meetings, and
- The maintenance of high standards of practice and professional care amongst those working within the industry and the promotion of improved safety standards for the protection of the general public.

Although it might appear that the IRSE is concerned only with railway signalling, the full text of the objectives makes clear that all forms of train control and traffic management, and communications systems, are within our scope of interest.

There is a clear emphasis in the objectives on 'public benefit'. This is most obvious in the sense of contributing to safety on the world's railways, where train control systems play a critical role. But we are also interested in ensuring that railways are efficient, cost-effective and sustainable (in the widest sense). We meet our obligations to the public through the following principal mechanisms:

- The dissemination of knowledge, experience and good practice in the fields of railway signalling, control and communications and allied topics, to help ensure that those working in the profession do so with the best available knowledge for the safe, efficient and cost-effective construction and operation of the world's railways.

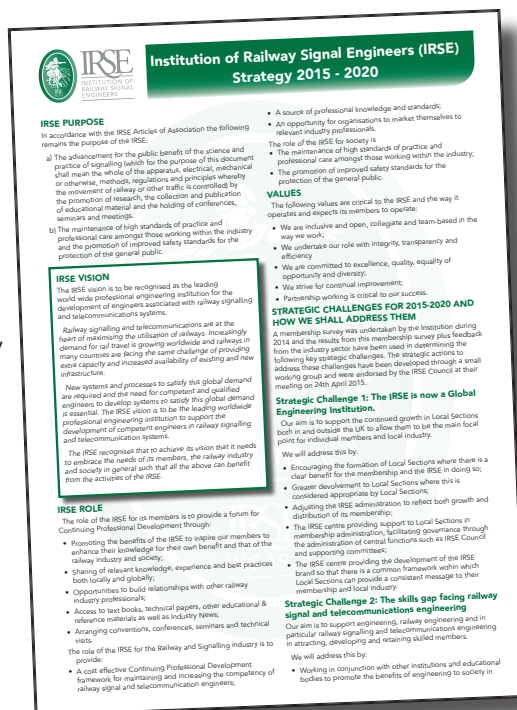
- The provision and management of the IRSE Licensing Scheme to assure the competence of those working in the profession. The Scheme is focused predominantly, but not exclusively, on ensuring safety in the design, construction, testing and maintenance of signalling and telecommunications systems.
- The publication of a Code of Professional Conduct with which IRSE members are required to comply in the course of their work. It emphasises topics such as personal responsibility for work undertaken or managed by IRSE members, the importance of safeguarding the public interest (particularly safety), environmental management, the efficient use of resources, handling conflicts of interest etc.
- Undertaking specific initiatives to help ensure the safety of railways, such as the production in 2015 of recommendations for maintaining and improving safety on Britain's railways (still the subject of ongoing work), and the formation in 2016 of an IRSE Section in China, to help engineers and others in that country to deliver ever safer railways.

The financial resources of the Institution are applied to achieve the objectives of the Institution, in addition to which members make a significant contribution to delivering the Institution's aims by voluntary effort. The Institution has only a small number of full and part-time staff and most of the activities are organised by our members acting in a voluntary capacity.

## Our Strategy

In mid-2015 the IRSE launched its new Strategy, to cover the period 2015-2020. The Strategy is supported by an Implementation Plan that sets out in more detail the specific initiatives to be delivered. Both the Strategy and the Plan are published and are available to the public on our website. The Plan, which is subject to regular monitoring and review by the IRSE's governing Council, addresses a number of key areas, including:

- Tackling the skills gap facing railway signal, control and communications engineering in the UK and other countries in the world.
- Encouraging employer support for IRSE to help ensure that the Institution's activities align with the needs of the wider industry.
- Enabling growth of the IRSE as a global Engineering Institution, so as to promote professional standards throughout the world.



will happen in 2017, led by the University of Birmingham (UK). We also intend to make progress in 2017 with providing better support for Local Sections, which is another feature of the Plan.

In 2016 we closed our Company Affiliation Scheme, as the evidence suggested that it was not providing real benefit for either the member companies or the IRSE. Consideration is being given to the development of a new Scheme. Again, this is a feature of the Implementation Plan.

The Strategy is subject to ongoing review by Council, and during 2016 a number of additional elements were introduced, particularly in the Implementation Plan, to strengthen our commitment to diversity, equality and inclusion. The text of a Diversity, Equality and Inclusion Policy was agreed during late 2016, although it was not formally approved until January 2017.

By the end of 2016 we were approximately 18 months into delivering the Strategy. Progress has been variable. On the positive side, three new Sections of the IRSE were launched in 2016, in line with the Implementation Plan, and we have made a good start on identifying and prioritising our needs for improved communications and marketing. The Plan also includes the establishment of an MSc in Train Control Systems, which we hope

**ABOVE ALL, THE OBJECTIVES OF THE INSTITUTION ARE FOCUSED ON PUBLIC BENEFIT AND, IN PARTICULAR, THE SAFETY OF THOSE WHO TRAVEL BY RAIL."**

# Governance

## Council

The IRSE is governed by an elected Council of twenty one Corporate Members, led by the President, who are the Trustees and Directors of the Institution.

Six meetings of the Council were held during the year during which the business of the Institution was conducted. The Articles of Association permit the current Chairmen of all local Sections, both in and outside the UK, and also Country Vice-Presidents to attend Council meetings. During the year a number of Chairmen and Country Vice-Presidents attended some meetings either in person or using video conference facilities.

In addition to conducting all the normal Council business during the year, Council discussions included the following topics:

- Progress with the Strategy 2015-20.
- Implementing the membership and licensing database.
- Introduction of a new award (the IRSE-Signet Award).
- How to support younger members better.
- Our commitment to diversity, equality and inclusion.
- The future of the Wing Award.
- Formation of the IRSE Thailand and China Sections.

## Committees

The Institution has a number of Committees which are accountable to Council, through which our activities are managed. The principal Committees and their relationships to Council are shown in the diagram.

In addition, ad-hoc working groups are formed from time to time which focus on specific tasks. During 2016, one of these was a working group on revised arrangements for applying to take the annual IRSE Examination.

## Audit

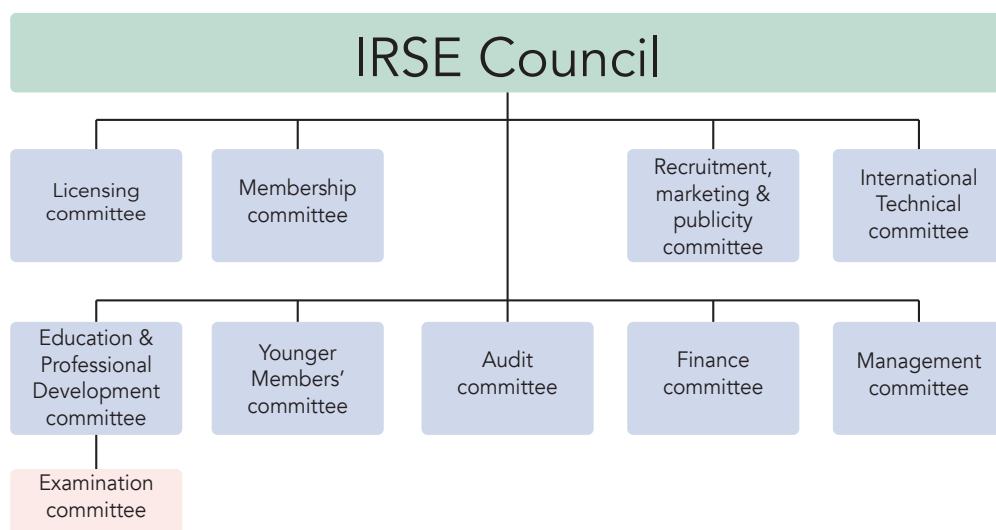
### External Audit

A number of areas of the Institution's business are audited on a regular basis by various external audit bodies:

- All areas of finance are subject to audit annually by independent external auditors who submit their report to the Annual General Meeting.
- The Licensing Scheme is subject to an annual external audit by the United Kingdom Accreditation Service (UKAS).
- As a registered Charity, the Institution is subject to periodic external review by the Charity Commission.
- As the Institution is licensed by the Engineering Council (EC) in the UK to register Chartered and Incorporated Engineers and Engineering Technicians, it is subject to a review every five years by the EC in order to ensure compliance with their registration standards. One of these reviews took place in early 2016, with a satisfactory outcome and only minor proposals for improvement.

### Internal audit

The IRSE's internal Audit Committee undertakes independent audits to complement the external audits, in order to ensure



the Institution is running efficiently and effectively. The audits focus primarily on the role and remit of each of the principal Committees of the Institution.

The Audit Committee normally performs two audits per annum. Each audit results in a report, presented to the Chair of that Committee and subsequently the Council, which uses the recommendations to improve the management of the Institution's affairs for public benefit and for the benefit of its members. During 2016 internal audits of the Recruitment, Management and Publicity Committee, and of Finance Committee. In both cases the findings were satisfactory, with a number of recommendations for improvement but no mandatory corrective actions.

## IRSE Enterprises

IRSE Enterprises Ltd is the trading company wholly owned by the Institution. It handles a number of activities which are associated with but outside the direct scope of the charity. The Directors of the company appointed for the year April 2015 to April 2016 were:

- Chairman: David Weedon
- Chairman of Finance Committee: Andrew Simmons
- Junior Vice-President: Markus Montigel
- IRSE Treasurer: Andrew Smith
- IRSE Chief Executive: Francis How

Any profits from the company are, where possible, gift-aided back to the Institution.

## Sections

The IRSE Sections around the world exist by authority of the IRSE Council, and they operate in accordance with a set of Articles of Association (or Byelaws) that have been approved by Council. At the end of 2016 there were 20 geographical Sections, 5 of which are UK-based and the others are in various parts of the world (Australasia, China, France, Hong Kong, India, Indonesia, Ireland, Malaysia, Netherlands, North America, Singapore, Southern Africa, Switzerland, Thailand). Three of these were newly formed in 2016 – France, China and Thailand.

Each Section has an organising Committee, with elected officers for key roles. Information about the activities of the Sections is provided elsewhere in this report.

Two other Sections also exist – the Younger Members' Section and the Minor Railways' Section. These are not geographically-based, although their activities are predominantly within the UK. Some geographical Sections also have younger members' groups.

# Supporting Professional Development

## Education and Professional Development Committee

The Education and Professional Development Committee held five meetings during the year, further developing the items identified in its work-plan. The Committee continued to focus on the needs of IRSE members around the world. Membership of the Committee includes representatives from Australia, Hong Kong, India, Malaysia and South Africa as well as the UK.

## Professional Development Manager

Elaine Clark performed a valuable role as our Professional Development Manager during 2016, but at the end of the year decided to stop for personal reasons. Judith Ward has been appointed in her place, commencing in January 2017.

## IRSE Professional Examination

To increase the readiness of candidates sitting the IRSE's Professional Examination in 2016, all candidates had to gain support of a Sponsor (a Member or Fellow of IRSE) who vouched for their preparation for the examination. In October 2016, 246 candidates sat a total of 363 papers at centres around the world (a reduction in numbers compared with 2015). The pass rate has slightly improved from the 2015 situation. The Examination Committee, with the support of the staff in London, continues to work hard to support the Exam process and the candidates, for which the Institution is most grateful.

Support material for the IRSE Professional Examination modules has continued to be reviewed and updated during 2016, and further support material has been developed and published. It is anticipated to be complete in time to benefit 2017 examination candidates.

## Continuous Professional Development (CPD) Recording and Monitoring

In readiness for the UK Engineering Council's requirement of random monitoring of registered engineers' CPD records, processes have been put in place for review in early 2017, and members of the Membership and Registration Committee have volunteered to review CPD records of a random sample.

**// MATERIAL TO HELP CANDIDATES PREPARE FOR THE IRSE EXAM HAS CONTINUED TO BE REVIEWED AND UPDATED DURING THE YEAR."**

A number of articles have been published in IRSE NEWS during 2016 to explain CPD and its importance to members, maintaining or developing their knowledge and experience to enable them to do their current job and/or a future role to a professional standard.

The IRSE continues to recommend the use of the 'Mycareerpath' system for CPD recording which has been further updated to incorporate comments from users. The 'Mycareerpath' system will also be utilised for monitoring and auditing of CPD. More information about Mycareerpath is available on the IRSE website.

## Mentoring Scheme

The IRSE Mentoring Scheme is being utilised by 14 members working with 12 mentors from around the world at present. Matt Slade (chair of the Younger Members Section in 2016) allocates mentees to mentors. We have more members waiting to be mentored, but we are presently constrained by a lack of mentors in the right geographical areas.

The scheme aims to develop members' professional competence, help them achieve their learning objectives, and enhance their non-technical skills to maximise their potential, particularly in the early stages of their career.

## Masters Railway Signalling and Telecommunications Programme

The E&PD Committee and Professional Development Manager have continued to support work to find a university to replace Central Queensland University's Railway Signalling & Telecommunications Programme which CQU had run for several years. IRSE is currently supporting University of Birmingham in their proposed provision of courses in Railway Communications and Control, expected to commence in Autumn 2017. The courses could be potentially deemed suitable as exemption for some or all of the IRSE examination modules, dependent on content and level.

# Membership and registration

The Membership Committee considered 449 applications for membership in 2016. The net change in membership during the year was a small decrease, as the table below shows.

Grade	2015	2016
Companion	32	25
Hon Fellow	53	54
Hon Fellow (Non-corporate)	3	3
Fellow	530	537
Member	1733	1781
Associate Member	1152	1156
Accredited Technician	218	225
Affiliate	1666	1584
<b>Totals</b>	<b>5387</b>	<b>5365</b>

**// GROWING NUMBERS OF MEMBERS ARE SEEKING ENGINEERING COUNCIL REGISTRATION."**

We are pleased to report that interest in gaining Engineering Council registration via the IRSE continued to grow during the year. In 2016 we had an increase of over 100% in the numbers of successful applicants. Seven were registered as Chartered Engineers, eight as Incorporated Engineers, and 19 as Engineering Technicians. As a result of the growing number of applications, it was agreed that our pool of assessors/interviewers should be increased. We therefore began the process of recruiting new people to take on the extra workload.

We noted with sadness the deaths of the following members during 2016: JD Baker (Fellow), J Boura (Hon Fellow), AJ Fieldhouse (Member), P Haldar (Member), E Harris (Fellow), NR Harris (Fellow), G McLintock (Accredited Technician), JB McLuckie (Member), VH Smith (Hon Fellow), A Watson (Associate Member) and CJ Watts (Associate Member).

# Awards

The IRSE makes a number of awards each year. The majority of these are to recognise, reward and encourage the professional development of engineers (particularly those in the earlier stages of their careers). The purpose behind this is not simply to assist their career development, but to promote high standards of engineering excellence, thereby contributing to the public benefit objectives of the Institution.

## Frank Hewlett Bequest & Alan Fisher Memorial Fund

Frank Hewlett was an Associate Member of the Institution. He died in September 2008 and left a very generous bequest of £250,000 to the Institution. In 2009 the IRSE Council launched an appeal to establish a memorial fund for Alan Fisher, who died unexpectedly during his Presidency of the Institution. The intention was to use the fund to support the development of young S&T engineers, particularly those outside the UK.

In 2016 the income from the two funds was used to provide a number of travelling bursaries valued at up to £1000 each to younger members from all over the world to support their attendance at the 2016 International Technical Convention in China.

## Thorowgood Scholarship

The Thorowgood scholarship is awarded annually under a bequest of the late WJ Thorowgood (Past President) to assist the development of a young engineer employed in the signalling and telecommunications field of engineering. It takes the form of an engraved medallion and £1500 to be used to finance a study tour of railway signalling installations or signalling manufacturing facilities.

The award is made to the young member who achieves the best performance in the IRSE exam, with at least a pass with credit in four modules.

In the 2015 examination, the award was given to Tom Corker, a graduate engineer working at the time for Balfour Beatty Rail at Derby in the UK. He achieved a Distinction, two Credits and a Pass in his four modules, and was presented with his award at the 2016 AGM. He subsequently undertook his study tour in Japan visiting signalling installations and companies. His report appeared in the March 2017 edition of IRSE NEWS.



## IRSE Merit Award

IRSE Merit Awards are presented to individuals for meritorious service to the Institution's work and objectives. During 2016 four awards were made. The first was to Peter Woodbridge, for services to candidates preparing for the IRSE Examination, and others to Ponnudurai Satyamoorthy, Peter Allen and Malcolm Menadue for services to the Malaysian, Scottish and Australasian Sections respectively.

## Dell Award

The Dell Award is made annually under a bequest of the late Robert Dell OBE (Past President). It is awarded to a member of the Institution employed by London Underground Ltd (LUL) for achievement of a high standard of skill in the science and application of railway signalling. The award takes the form of a plaque with a uniquely designed shield with an engraved plate

being added each year with the recipient's name and a cheque for £300 to spend as the recipient wishes.

The 2016 Dell Award was made to Jane Power of London Underground Ltd. Jane's role is the System Design Authority for LUL's Four Lines Modernisation (4LM) Programme. She was presented with her award at the 2016 AGM.



## IRSE / Network Rail Apprentices of the Year

The IRSE makes two awards annually to Network Rail's apprentices, one to the outstanding signalling apprentice and one to the outstanding telecommunications apprentice. The Award for signalling is a trophy consisting of a working model of a four-aspect colour light signal kindly donated by the Unipart Service Centre at York. The award for telecommunications is a silver trophy. Each recipient also gets a cheque for £100 and a year's free membership of the Institution. In 2016 the awards were presented to Luke Hill (IRSE/Network Rail S&T Apprentice of the Year Award) and to Liam Pindard (IRSE / Network Rail Telecommunications Apprentice of the Year Award). Luke (left) and Liam (right) are shown below receiving their awards from IRSE Chief Executive, Francis How.



// AWARDS HELP TO PROMOTE HIGH STANDARDS OF ENGINEERING EXCELLENCE, THEREBY CONTRIBUTING TO THE PUBLIC BENEFIT OBJECTIVES OF THE INSTITUTION."

### IRSE Signet Award

During 2016 the IRSE introduced a new award, sponsored by Signet Solutions Ltd. This award is given annually to the person who obtains the highest marks in any single module of the IRSE Examination. The award takes the form of the Signet logo 'person' on a small plinth, engraved with the name and year of the winner, and bearing the IRSE's logo. The award also includes funding for the winner to attend the annual IRSE Convention.

The first ever winner of this award, in 2016, was Rob Taylor-Rose, a Signalling Project Engineer with Network Rail. Fittingly, he was presented with the award at the Signet Solutions 20th Anniversary Celebrations on 19 July 2016, in Derby (UK).

### Wing Award

The Wing Award for Safety, commemorating the life and work of the late Peter Wing (Fellow) has been presented for many years to recognise significant contributions to track safety. The Wing Award was not presented in 2016, as there were only two applications, neither of which were considered by the judging panel to meet the criteria for making the award.

In recent years the numbers of applications for this award has dwindled significantly, although the focus on trackside safety by the industry remains as strong as ever. Therefore after much deliberation, and in consultation with Peter Wing's widow, the IRSE's governing Council has decided to close this award down. For over 20 years the award has been an indicator of the seriousness with which the rail industry takes the safety of people working on the railway, as well as an enduring reminder of the step change in safety that was brought about by Peter's efforts. The IRSE, and the wider industry, continue to owe a debt of gratitude to Peter for his visionary work, and the IRSE has been honoured to manage to Wing Award on behalf of the rail industry.

## Licensing

The IRSE operates a competence certification scheme, known as the IRSE Licensing Scheme, which exists in order to provide assurance for the competence of individuals to carry out technical safety-critical or safety-related work on rail traffic management systems. The Scheme provides a cross-industry accepted benchmark of competence for personnel carrying out a range of safety critical activities. The Scheme is managed by the Licensing Registrar supported by a small team in the IRSE offices in London, which works under the direction of the Licensing Committee. During the past year approximately 1,600 licences were issued, and the total number of valid licences on 31 December 2016 was 6,483 (over 200 more than a year earlier). Each licence is valid for five years. The Licensing Scheme continues to hold full approval by the United Kingdom Accreditation Service (UKAS) against the competence standard for the certification of persons: ISO17024:2012.

IRSE Assessing Agents are approved and appointed for the purposes of performing assessments of candidates for licences, and they are in essential part of the Licensing Scheme. Currently the number of approved Assessing Agencies is 31. There was one new Assessing Agency approved in 2016, and two closures

// THE IRSE LICENSING SCHEME PROVIDES A CROSS-INDUSTRY BENCHMARK OF COMPETENCE FOR STAFF WORKING ON RAILWAY SIGNALLING AND TELECOMMUNICATIONS ACTIVITIES."

occurred. Both closures were for agencies based inside the UK. There are now 28 approved agencies within the UK and three outside, two of which are based in Australia and one in Hong Kong.

During 2016 the Signalling Tester suite of licences underwent extensive review in order to ensure that the high levels of competence expected from the Industry are maintained. Growing Industry concerns about cyber-security are now reflected in the Scheme's assessment process across the discipline.

Towards the end of 2016 the Licensing team in the London office was strengthened by the appointment of Karen Boyd as our Senior Licensing Administrator – a welcome addition.

## Presidential programme

Each year the IRSE President plans a Programme of major events, comprising a series of high profile technical papers, the annual Convention and other events as appropriate. Our President up to April 2016 was Andrew Simmons, and the final two technical papers in his year, presented in early 2016, were on the subjects of: Telecomms and the Digital Railway; and Data quality management systems.

Charles Page, our President from April 2016 onwards (to April 2017), took as his theme for the year the subject of 'Inform, Discuss, Develop', reflecting the role of the IRSE and its members in professional development. The first three papers delivered during 2016 were on the subjects of: The evolution of signalling technologies in Hong Kong; Re-signalling the East Rail Line in Hong Kong (technical challenges and solutions); and

// THE PRESIDENTIAL PROGRAMME PROVIDES THE OPPORTUNITY FOR IN-DEPTH ANALYSIS OF A CHOSEN THEME OVER THE COURSE OF A YEAR."

implementing risk-based rail asset management. The theme continues with further papers in 2017.

All the papers are published in our monthly publication, IRSE NEWS, and the presentations are available as webcasts on the IRSE website.

# London office and personnel

The Institution leases a small suite of offices on the 4th floor of the Institution of Mechanical Engineers, 1 Birdcage Walk, London, UK, from where the centrally organised activities of the Institution are managed – membership, licensing, events administration, financial administration, publicity, communications and IT systems operation. The lease on the offices was renewed in April 2016.

The Chief Executive and General Secretary of the Institution is Francis How, a Past-President of the Institution, who was appointed in August 2015. Francis is responsible for directing and managing the resources of the Institution in order to implement the decisions of Council in an efficient manner and in compliance with UK company and charity law. He is accountable to the Council. He also provides the focal point of contact for other Institutions and external organisations, including the UK's Engineering Council and the Royal Academy of Engineering, government agencies, the chief officers of other professional bodies, and the scientific, engineering and technology community. He is also responsible for ensuring that the legal requirements of the Institution's Articles of Association, the Registrar of Companies and the Charities Commission are met.

The office team comprises:

- Christine White, Membership and Registration Manager
- Hilary Cohen, Administration Manager
- Paula Persson, Licensing Registrar
- Judith Ward, Professional Development Manager
- Karen Boyd, Senior Licensing Administrator
- Roger Button, Licensing Assistant
- Caterina Indolenti, Membership and Registration Administrator
- Anja Laitinen, Administration Assistant (part-time)
- Hannah Mueller, Finance Assistant (part-time)

Karen Boyd joined us in November 2016, and is a very welcome addition to the licensing team. Judith Ward was appointed as our Professional Development Manager in November 2016, although she did not actually join us until January 2017. Linda O'Shea (who helped with Licensing) retired in December 2016, and Elaine Clark, who provided professional development services, also stepped down in December 2016.

Andrew Smith is the Institution's Treasurer, with responsibility for the production of the budgets and accounts, and for monitoring the health of the Institution's savings and investments.

Debbie Bailey is our Personnel Manager and Spencer Williamson is our IT Manager, supported by Jason Frazer who focuses on website support (Jason replaced David Mackay, who stepped down in November 2016). These staff work on part-time contract basis.



Some of our London Office staff. Top row left to right, Judith Ward, Francis How and Karen Boyd. Bottom row Hilary Cohen, Anja Laitinen, Roger Button, Judith Ward, Christine White and Caterina Indolenti.

## Section activities

In addition to the Presidential Programme, every year there is an extensive programme of lectures, seminars and technical visits organised by the Institution's Sections in Australasia, China, France, Hong Kong, India, Indonesia, Ireland, Malaysia, Netherlands, North America, Singapore, Switzerland, Thailand and Southern Africa, and by the Midland & North Western, Plymouth, Scottish, Western, York and Minor Railways Sections in the United Kingdom together with the Younger Members' Section. Many of these activities are listed publicly online on the IRSE website. The more significant events are reported in IRSE NEWS.

The geographical Sections vary considerably in size (from around 40 members up to several hundred), and in levels of activity. Each has its own organising Committee, elected officers and programme of events. They report annually to the Council on their work.

Three new Sections were inaugurated during 2016. The first was the French Section, in January, followed by the Thailand Section in July, and the China Section in October. The China Section inauguration took place during, and was a highpoint of, the very successful IRSE's International Technical Convention held in Beijing, which you can read about elsewhere in this report.

The Council wishes to record its thanks to the Officers, Committee members and all others involved in the operation of the Local Sections, for the excellent work they undertake in organising technical meetings and other events. Council also very much appreciates the help and support given by many companies in facilitating and supporting the events organised by the Sections all over the world.



North American Section



# Younger Members

The Younger Members' Section has continued to receive great support from younger and more experienced members alike in 2016. The beginning of the year saw the arrival of new Chairman Matt Slade and the increase in size of the Committee to eight, with the intention of engaging with younger members more effectively, providing opportunities for networking, and sharing knowledge across the signalling industry's younger community.

Our series of technical visits to the Great Western train care depot, the Hitachi ETCS Simulator, Aldwych (disused London Underground station) Visit, and the Crossrail Integration Facility, has provided younger members with the opportunity to experience locations and facilities beyond their usual day job. The highlight visit of the year was our well attended International Technical Visit to Lisbon (Portugal) in April, supported by Transportes de Lisboa and organised by Vivich Silapasoonthorn.

The Section has continued to deliver on its commitment to provide study opportunities for people taking the IRSE Exam. With the continued invaluable support of Peter Woodbridge, David Nicholson and Reuben Dakin, among others, two exam

study events were hosted in 2016. The first was a Module 1 and 7 event, supported by Atkins in April; and in July a Module 2, 3 and 5 study weekend, supported by Signet. Both events were well attended and gratefully received by younger members, giving them solid ground for their exam preparations.

November saw the Younger Member's flagship event, The Annual Seminar and Technical Visit, move to Scotland (specifically, Glasgow) for the first time in recent history. The event "*Enhancing Rail Capacity Across the UK*", welcomed a range of presenters, from operators and clients to suppliers and consultants. The locality ensured a good number of fresh faces and conversations. The following day the attendees had a tour of Strathclyde Partnership for Transport's Broomloan Depot, following the IRSE Scottish Section Annual Dinner.

Overall it was another successful year for the Younger Members, setting new benchmark for 2017. We hope to see many more fresh faces and some of the older ones (you know who you are!) at our events in the near future.



## Annual General Meeting 2016

The IRSE's 103rd Annual General Meeting, chaired by the retiring President, Andrew Simmons, was held at the Institution of Engineering and Technology, London on Friday 22 April 2016.

After conducting the formal business of the AGM, Andrew commented on the Annual Report for 2015 (published on 1 April 2016), drawing attention to the "*IRSE in numbers*" on the back page of the Report as testimony to the health of the Institution worldwide. He welcomed the publication during the past year of the IRSE Strategy for 2015-2020, reflecting the IRSE's global aspirations, and expressing confidence that we would see the fruits of the Strategy over the next 2-3 years.

In speaking about the Accounts, the Treasurer, Andrew Smith, commented that the project to replace the Institution's Membership and Licensing Database had commenced in 2015, and that there would be significant further expenditure during 2016 (with project completion planned for September 2016).

Andrew Simmons announced that the ballot for the election of members to Council had resulted in Buddhadev Dutta Chowdhury, Lynsey Hunter and Simon Eastmond receiving the highest numbers of votes, and that they were therefore duly elected. He also welcomed those who were joining Council for the first time – Steve Boshier (Australia/New Zealand), Yuji Hirao (Japan), Helen Kellaway (UK), and Andy Knight (UK).

### IRSE Council 2015-2016

#### President

Charles Page

#### Vice Presidents

Peter Symons

Markus Montigel

#### Members of Council from class of Fellow

Ian Bridges

Daniel Woodland

George Clark

Gary Simpson

Steve Boshier

Philip Wong

Andy Stringer

Alan Rumsey

Yuji Hirao

Andy Knight

#### Members of Council from class of Member

Rob Burkhardt

Martin Fenner

Simon Eastmond

B Dutta Chowdhury

Ryan Gould

Lynsey Hunter

#### Members of Council from class of Associate Member

Firas Al-Tahan

Helen Kellaway

// THE AGM IS AN OPPORTUNITY TO REFLECT ON THE YEAR GONE BY AND TO LOOK TO THE FUTURE."

Andrew then proposed a vote of thanks to the following retiring members of Council for their service to the Institution:

- Ken Burrage (Fellow)
- Tony Kornas (Fellow)
- Peter Grant (Member)

It was also announced that Christian Sevestre would also be retiring from Council (rather than being co-opted as a past-President for a further year). The Council is very grateful for Christian's contribution to its work.

Announcements and presentations were made to the recipients of the Thorrowgood Scholarship, the Dell Award and Merit Awards (for more details see the Awards section of this Report).

Andrew announced that Council had elected Alan Nielson (New Zealand), Trevor Moore (Australia), David Thurston (USA),

and Francis How (UK) as Honorary Fellows of the Institution in recognition of their major contributions to the work of the IRSE over many years. In addition, Wim Fabries (Director of the Dutch ERTMS programme) was elected by Council as a Companion in recognition of his support for the IRSE and his leadership of the ERTMS programme in the Netherlands.

This was followed by the inauguration of the new President, Charles Page, who then gave his Presidential Address. His theme for the year was *"Inform, Discuss, Develop"*, observing that *"the Institution does many worthwhile things, but what it does best is to provide the means to share knowledge and facilitate critical discussion. We match-make expert authors and speakers to meetings where they can present and we can discuss. That is one of the ways in which we encourage the professional development of our members for their benefit, the benefit of the industry and for the benefit of the public at large. In essence, that is our value proposition."*

## Annual Dinner

331 members and guests attended the 52nd Annual Dinner which was held at The Savoy on Friday 22 April 2016, following the AGM and the inauguration of new President Peter Symons. Michael Peter, CEO of Siemens Mobility Management Business Unit was the principal guest and he gave a short speech.

Following the successful innovation of having a toastmaster the previous year, further changes to the arrangements in 2016 included the provision of improved audio visual (AV) facilities to assist the President and principal guest in speaking to the audience and to allow the speech to be recorded for presentation through the IRSE's website. Siemens sponsored the event and 'Railway Children' was the nominated charity. The AV facilities allowed the IRSE, the sponsor and the charity to present information non-intrusively to the attendees during the dinner. The collection held for Railway Children during the dinner raised £5100.



From left to right, Principal Guest Michael Peter, with IRSE President Charles Page and Paul Copeland of Siemens.



## Members' lunch

The Annual Members' Lunch took place on 15 June 2016 in London, and was attended by almost 100 IRSE members and staff. Our President, Charles Page, introduced and spoke at the event, referring to the plans for his Presidential Year, which was to include visits to many Local Sections, a series of Technical Papers to be delivered at various locations, and the continuing work on delivering the IRSE Strategy 2015-2020. He also presented Francis How with his certificate for being elected as an Honorary Fellow of the Institution.

Francis How also spoke briefly, noting the achievements and growth of the IRSE over the past 12 months, with new Local Sections in France, Thailand and China being established during the year. Membership continues to rise, now at around 5,400. He also commended Tom Corker, our Thorrowgood Scholar (who attended the Lunch) for his achievement of a Distinction, two Credits and a Pass in the Exam in 2015. For his Thorrowgood Study Tour, Francis reported that Tom was planning to visit Japan in the autumn to learn about Japanese signalling and operations. In closing, Francis thanked the staff of the IRSE for their work over the past 12 months, and the many volunteers around the world who do so much to make the IRSE the success that it is.

## Seminars and technical visits

The IRSE and its Sections organise many technical meetings and seminars around the world, which are advertised on the Institution's website. For example, in 2016 these included:

- Signalling Seminar in Japan, February, organised by the International Technical Committee.
- Younger Members' International Technical Visit to Lisbon, April.
- Seminar on the application of Systems Engineering, Birmingham (UK), April.

- Swiss Section Seminar in Olten on ETCS and relay logic, June.
- The Younger Members' Seminar on Capacity Growth in Glasgow, November.
- Seminar on *"CBTC and Beyond"* in Toronto, December.

These are in addition to many smaller local meetings held frequently at various venues worldwide, at which papers and presentations on relevant subjects are presented.

# International Technical Convention

To hold the IRSE's International Technical Convention in Beijing has been an ambition of a number of people in Beijing, Hong Kong and elsewhere for several years. In 2016 it happened, with the opening event taking place on the evening of the first day (11 October), in the palatial surroundings of the Shangri La Hotel in north-west Beijing. Our host and lead organiser for the Convention was Beijing Jiaotong University (BJTU). "Jiaotong" means 'transport' or 'traffic', and BJTU excels in research relating to rail transport in particular. So it was appropriate that the opening speeches and words of welcome were made by Professor Feng Chen (Vice-President of BJTU) and Charles Page, our President. It was also an opportunity to thank our many Convention sponsors, without whom such a full and wide-ranging programme would not have been possible.

Traditionally, the first full day of an IRSE Convention is a 'papers day', during which presentations on a range of topics relevant to the week are made. But this was a special day, when we officially inaugurated the China Section of the IRSE. This was a landmark event, the culmination of much planning and hard work. Professor Ning Bin, the President of BJTU and a Fellow of the IRSE since 1992, was the inspiration behind the formation of the China Section. His colleagues, including specifically Professor Yinghong Wen with the support of the IRSE Hong Kong Section, had been instrumental in making it a reality.

The day of technical papers on subjects related to the railways in China was followed by three days of technical visits to see railway research institutes and educational centres, and to see some of China's railway installations and systems. High speed and metro railways both featured.

Arguably the last afternoon of the Convention was also the most impressive. We were taken to the campus of Beijing Jiaotong University to see the development, testing and simulation facilities that the university uses to support the burgeoning rail industry in China. They undertake a wide range of activities, including software development, the conformity assessment of suppliers' train control and communications systems, assessing the technical interoperability of equipment, investigating the optimisation of passenger flows in stations, GSM-R and LTE system analysis, RBC testing, safety-critical system research – to name just some of them. Finally, and most impressively of all, we saw the railway simulation facility at BJTU, which combines a massive database (40 billion terabytes of operational, asset management and marketing data for the whole 120,000 km China rail network), a simulation platform for train control, and a high speed driving cab simulator. This provides a platform for the comprehensive integration testing and simulation of the rail network.

Amongst the delegates for the Convention had been 12 Hewlett-Fisher bursary winners, and Rob Taylor-Rose, winner of the first ever IRSE-Signet Award for obtaining the highest marks in a single module of the IRSE Exam. The Convention presented a unique opportunity for young engineers to see another country's railway technology at first hand, to learn from more experienced engineers, and to extend their network of professional contacts across the 15+ countries from whom the ~130 delegates came. Their participation in, and their contribution to the success of, the Convention was acknowledged by Charles in his closing speech at the Gala Dinner on the last night.



# International Technical Committee

The IRSE's International Technical Committee (ITC) has 27 fully participating and 6 corresponding members from many parts of the world, including Japan, USA, the UK, Netherlands, Italy, Germany, Switzerland, Belgium, Finland, France, Australia, Spain, Singapore and Canada.

The ITC's primary purpose is to provide thought leadership and disseminate learning on strategic or technical topics relevant train control and communications systems in the railway environment, thereby providing value not only to IRSE members but to the wider rail industry. Its particular strength lies in its international membership at senior level, enabling engineering principles and practices from a diverse range of countries to be brought to bear upon the subjects that ITC debates.

During the year, the ITC held 4 meetings, in Tokyo, Paris, Berlin and London. The ITC produced three papers, "Driving evolution

towards IP in signalling telecoms", "Train Convoys or Virtual Coupling?" and "ETCS Level 2 meets existing interlockings – a challenge?", all of which have been published in IRSE NEWS. It also cooperated with JR East in preparing a successful seminar held in Tokyo in April, organised by Yuji Hirao and Masayuki Matsumoto, and sponsored by JR East and Hitachi.

ITC meetings are hosted by members in their country and minutes are produced for each meeting. An annual report is produced for the Council summarising the ITC's activities during the year.

Early in 2016 Frans Heijnen took over as Chair of the ITC when Christian Sevestre retired after many years of successful chairmanship. Laura Arenas took over the role of secretary after Hugh Rochford stepped down in September.

# Publications and communications

In the IRSE's five-year Strategy published in 2015, the Institution committed itself to improving how it communicates with the wider rail industry, as well as its members. We have now been working on this element of the Strategy for about 12 months, during which we have engaged a consultancy to advise us on the approach we should take. The work so far has provided us with a valuable reflective insight as to how we are perceived by others, and our strengths and weaknesses. It has also helped us identify the priorities for action in 2017 and the subsequent years of the Strategy. The commentary that follows relates to existing communication mechanisms in place during 2016.

## IRSE NEWS

IRSE NEWS is published monthly, its purpose being primarily to inform IRSE members worldwide about industry news, technical developments, and the work and activities of the IRSE and its Sections. Papers that comprise the Presidential Programme are published in IRSE NEWS, together with a wide range of other internationally sourced educational papers and articles.

## Proceedings

The Institution's Proceedings for 2015-2016 were published in November 2016 and are available on the IRSE website. The Proceedings provide a summary of the Institution's activities and have been produced annually since the very first issue in 1913. 2016 heralded a change from previous practice, and for the first time we decided not to produce hard copies or DVD versions of the Proceedings but to make the material available online only.

## Website

The website provides details of Institution events, Sections, information about the governance and operation of the IRSE, material for members taking the IRSE professional examination, how to become a member, as well as a wealth of information relating to professional development. Members (and registered non-members) can update contact details, book events, order



// IRSE NEWS IS AN IMPORTANT WAY OF COMMUNICATING WITH OUR MEMBERS WORLDWIDE."

publications, and pay their subscriptions on-line. We also advertise industry vacancies that may be of interest to IRSE members and non-members.

## E-communication

A monthly email bulletin is sent to all members, containing information about upcoming events and other topical information. The IRSE also makes use of social media channels such as Twitter.

## Publications

The IRSE publishes a range of books on railway train control and communications systems, which provide a useful source of educational material for those relatively new to the profession, as well as providing a valuable record of the development of signalling. During 2016 we made a written submission in response to the UK's parliamentary Transport Committee request for views on the application of signalling technology. We also started a pilot online 'Knowledge Base' containing abstracts of papers published by the IRSE and its members.

## Library

Members of the Institution are permitted to use the library of the Institution of Engineering & Technology in London, and there is also an archive collection of publications available on request at the IRSE's London offices.

# IT systems

The three major IT components that support the Institution's operations are the Membership and Licensing Database, the Website, and the London office IT systems.

In December 2015, following work to develop a specification, the IRSE Council authorised the Institution to contract for the provision of a new Membership and Licensing database system, the plan being to commence implementation in January 2016 and complete in August 2016. The system was eventually commissioned in early October, slightly later than planned, at a cost that was approximately 12% over budget. Perhaps not surprisingly, we have encountered a number of issues that have required resolution, some of which have impacted on IRSE members as well as the staff in the London office. Our

expectation is that during the next few months these will all be resolved and the benefits of the new system begin to be felt.

The two IRSE websites have continued to operate reasonably effectively, although the Licensing website suffered an extended outage during October. Our work on improving our communications includes the aspiration to radically improve the websites over the next 12 to 18 months, to make information more readily accessible and to improve its visual appearance and appeal.

In order to improve our resilience to IT problems, as well as to improve our capabilities, we have established a contract with a second IT expert, Jason Frazer, to work with Spencer Williamson, our IT Manager.

# Collaboration with other organisations

The IRSE has both formal and informal working relationships with a number of organisations in the UK and, either directly or through its Sections, with organisations in other parts of the world. In China and South East Asia in particular, the IRSE's Sections are forging closer links with other engineering and educational organisations, and with governments. These links are very much welcomed by the IRSE.

In late 2016 the decision was made by the IRSE's governing Council to close our existing Company Affiliation Scheme, as it had become evident that it was providing little tangible value either for the companies who participated, or for the IRSE. Nevertheless, an important element of our five-year Strategy is to strengthen our engagement with external bodies, including not only rail industry companies, but also other relevant organisations. The Institution enjoys good working relationships with, and support from, many companies, but our ambition is to grow this further for mutual benefit.

In the UK, two organisations are of particular significance for the Institution as a whole:

## Engineering Council

The UK's Engineering Council is responsible for the regulation of engineers, particularly in the UK. The IRSE is a licensed body of the Engineering Council and is thus licensed to register Chartered Engineers, Incorporated Engineers and Engineering Technicians.

## The Royal Academy of Engineering

The Royal Academy of Engineering is the lead representative organisation in the UK for matters relating to government policy on engineering, including education. It works in close collaboration with all the licensed engineering institutions (of which the IRSE is one). It has two major work-streams, 'Engineering the Future' which deals with engineering policy issues, and 'E4E' (Engineering for Education) which deals with education policy issues in so far as they have implications for the supply of engineers and technicians for the future. The IRSE is a signatory of the RAE's Diversity Concordat, and as a consequence diversity, inclusion and equality are topics now reflected more explicitly in our five year Strategy.

# Finances

Following a change in UK accounting regulations, the format of our accounts has been fully amended in order to meet current best practice (FRS 102 SORP - Statement of Recommended Practice for Charities). As a result there has been a need to re-state last year's accounts. This means a comparison between last year's Annual Report and this Report will show slight differences. There is no change to the underlying source information and thus the financial state of the Institution.

The financial results are shown on pages 15-19. They are extracted from the consolidated accounts for the IRSE and its wholly owned trading subsidiary IRSE Enterprises Limited. The term 'Group' at the top of a set of figures refers to the two companies combined and 'Charity' to the IRSE alone.

The IRSE has had another successful year with a slight surplus of income over expenditure of £4,044. A larger surplus of £82,033 appears in the Consolidated Statement on page 16, but is a consequence of the income from investments and the profits realised by investment sales. A major expense during 2016 has been the replacement of the membership and licensing database system, which became necessary primarily because support was ending for the previous one.

The Balance Sheet on p15 shows that the total 'worth' of the Institution has increased in 2016, by £188,172. However, it will be noted that this is almost exactly mirrored by the increase in value of investments (£200,996), as can be seen from the second line in the table. Whilst some money has been transferred from the IRSE Enterprises bank account into investments, the main increase in this value is a result of the rise in the UK Stock Market. It should also be noted that there has been a significant reduction in the cash that we hold (Cash at bank and in hand), by roundly £186,000 as a result of the database replacement project. In the accounts this has, however, partially been offset by an increase in assets. The cost of the software itself will be depreciated over 3 years, so our assets have increased to show the remaining two thirds of the costs. The database is now in service, although we are still experiencing initial difficulties with some aspects of the system's functionality.

On the same page is the summary of the Wing Award Fund. Last year saw a reduction in value, as a consequence of the fall in the UK stock market. The recent rise that has occurred in the stock market is, not surprisingly, reflected in the results, which show an increase to a value above that at the end of 2014 (£13,899 compared with £13,507 at the end of 2014).

The majority of the main table on p16 shows the income and expenditure of the Institution, with the detail expanded in the following notes. The slight increase in subscription income, by £10,451, was offset by a significant reduction in other charitable income, mainly as a result of a fall in advertising revenue, the fact that we have not published any new text books, and the reduction in income from the Exam as a consequence of tightening up the entry requirements (£45,928 compared with £78,435 in 2015). There was also a reduction in income for IRSE Enterprises compared with 2015, although this was largely as a consequence of there being no ASPECT Conference in 2016. Consequently there was also a matching reduction in costs. Overall, there was a reduction in the net income from £88,132 to £15,012 for IRSE Enterprises, before the investments are considered.

As the new database system also contains information relating to Licensing Scheme, IRSE Enterprises makes a contribution to the database costs. This has been reflected in the figures and has led to a reduction of the money Gift Aided to the IRSE to £16,731. The Institution has recently taken on a new employee whose role, in part, is to act as the Deputy Licensing Registrar. This happened towards the end of 2016 and so had a relatively limited impact on these results, but is likely to have a more significant effect on next year's figures.

Members' attention is drawn to note 7 to the accounts, on p18, in which the 2016 Convention is shown as making a loss. This is largely due to promised sponsorship funding not being forthcoming in practice. It has been considered pragmatic to assume that it will not be received and thus it has been removed from the accounts. It is to be hoped that this is a one-off instance, but sponsorship for the Convention is proving increasingly difficult to arrange. This suggests that careful consideration needs to be given in the next few years as to how Conventions are funded, including the possibility of having to increase delegate fees to make up for shortfalls in sponsorship.

Finally, the slight increase in income from subscriptions identified in note 8 (p19) last year appears again this year and reflects the modest increase in subscriptions for 2016. In the light of the current UK economic climate, which must form the background for many of the financial decisions Council has to take, the IRSE's Management Committee has indicated that it would be preferable for subscriptions, and where appropriate other prices, to follow the general trend of the UK inflation rate.

# IRSE Consolidated Accounts

## THE INSTITUTION OF RAILWAY SIGNAL ENGINEERS CONSOLIDATED BALANCE SHEET AS AT 31st DECEMBER 2016

	Notes	Group 2016 £	Group 2015 £	Charity 2016 £	Charity 2015 £
<b>Fixed Assets</b>					
Tangible assets		129,932	1,675	129,930	1,675
Investments	1	1,452,195	1,251,199	1,109,122	1,003,317
		1,582,127	1,252,874	1,239,052	1,004,992
<b>Current Assets</b>					
Stocks	2	56,427	63,013	51,514	53,277
Debtors	3	187,528	140,142	320,910	311,301
Investments held as current assets	4	205,511	203,991	205,511	203,991
Cash at bank and in hand		593,249	779,157	210,368	314,864
		1,042,715	1,186,303	788,303	883,433
Creditors: amounts falling due within one year	5	(469,983)	(464,459)	(247,109)	(256,825)
<b>Net current assets</b>		572,732	721,844	541,194	626,608
<b>Total assets less current liabilities</b>		2,154,859	1,974,718	1,780,246	1,631,600
Creditors: amount falling due after more than one year	6	(292,084)	(300,115)	-	-
<b>Net assets</b>		1,862,775	1,674,603	1,780,246	1,631,600
<b>The Funds of the Charity</b>					
Restricted funds		34,251	40,387	34,251	40,387
Unrestricted funds					
General		803,825	745,918	946,780	826,788
Designated		1,024,699	888,298	799,215	764,425
<b>Total unrestricted funds</b>		1,828,524	1,634,216	1,745,995	1,591,213
<b>Total charity funds</b>		1,862,775	1,674,603	1,780,246	1,631,600

## THE WING AWARD FOR SAFETY BALANCE SHEET AS AT 31st DECEMBER 2016

	2016 £	2015 £
<b>Fixed Assets</b>		
Listed investments at fair value at 1 <sup>st</sup> January 2016	12,445	13,507
Additions	6,167	3,929
Disposals	(6,042)	(3,505)
Fair value adjustments	2,274	(1,486)
Listed investments at fair value at 31 <sup>st</sup> December 2016	14,844	12,445
<b>Current Liabilities</b>		
Fund manager - IRSE Main fund	(945)	(945)
<b>Net assets</b>	13,899	11,500
<b>Capital</b>		
Accumulated fund	13,899	11,500

Approved by the Trustees on 14 March 2017.

**C R PAGE**  
President  
Director and Trustee

**P SYMONS**  
Vice-President  
Director and Trustee

**A P SMITH**  
Treasurer

# IRSE Consolidated Accounts

## THE INSTITUTION OF RAILWAY SIGNAL ENGINEERS CONSOLIDATED STATEMENT OF FINANCIAL ACTIVITIES FOR THE YEAR ENDED 31st DECEMBER 2016

	Notes	Restricted £	Unrestricted £	Total 2016 £	Total 2015 £
<b>INCOME FROM:</b>					
Donations and subscriptions	8	-	396,753	396,753	386,302
Other trading activities:					
within Charity	9	-	45,928	45,928	78,435
within Trading Company	7	-	533,460	533,460	586,503
Investments	10	766	41,100	41,866	34,110
<b>Total income</b>		<b>766</b>	<b>1,017,241</b>	<b>1,018,007</b>	<b>1,085,350</b>
<b>EXPENDITURE ON:</b>					
Raising Funds					
within Charity	11	-	96,893	96,893	106,850
within Trading Company	7	-	436,421	436,421	420,810
Charitable activities					
within Charity	12	1,800	354,956	356,756	413,694
within Trading Company	7	-	82,027	82,027	77,561
Net loss / (profit) on investments		-	(36,123)	(36,123)	(273)
<b>Total expenditure</b>		<b>1,800</b>	<b>934,174</b>	<b>935,974</b>	<b>1,018,642</b>
<b>Net income / (expenditure)</b>		<b>(1,034)</b>	<b>83,067</b>	<b>82,033</b>	<b>66,708</b>
Corporation tax		-	-	-	-
<b>Net income / (expenditure) after tax</b>		<b>(1,034)</b>	<b>83,067</b>	<b>82,033</b>	<b>66,708</b>
Transfers between Funds		-	-	-	-
Fair value adjustment		(5,102)	111,241	106,139	2,722
<b>Net movement in Funds</b>		<b>(6,136)</b>	<b>194,308</b>	<b>188,172</b>	<b>69,430</b>
Reconciliation of Funds					
Brought forward		40,387	1,634,216	1,674,603	1,605,173
<b>Total Funds carried forward</b>		<b>34,251</b>	<b>1,828,524</b>	<b>1,862,775</b>	<b>1,674,603</b>

## THE WING AWARD FOR SAFETY INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st DECEMBER 2016

	2016 £	2015 £
<b>INCOME FROM:</b>		
Dividends from fixed asset investments	436	540
	<b>436</b>	<b>540</b>
<b>EXPENDITURE ON:</b>		
Awards and other costs	110	610
<b>Net (expenditure) / income</b>	<b>326</b>	<b>(70)</b>
Fair value adjustments	2,274	(1,486)
Profit on disposal of investments	(201)	(6)
<b>Accumulated fund brought forward</b>	<b>11,500</b>	<b>13,062</b>
<b>Funds available for use</b>	<b>13,899</b>	<b>11,500</b>

## ANNUAL MEMBERS' REPORT WITH SUPPLEMENTARY MATERIAL

The tables set out on pages 15 to 19 are extracted from the full audited accounts of the Institution for the year ended 31 December 2016. They constitute supplementary material to this Annual Members' Report. Section 426A of the Companies Act 2006 requires the following statements to be made in respect of the supplementary material:

1. This annual report is only part of the company's annual accounts and reports prepared under the Companies Act.
2. A full copy of the company's annual accounts and reports may be obtained upon request from The Institution of Railway Signal Engineers, 4th Floor, 1 Birdcage Walk, Westminster, London SW1H 9JJ.
3. The auditor's report on the annual accounts was unqualified.
4. The auditor's statement under section 496 of the Companies Act (whether the Trustees' Report is consistent with the accounts) was unqualified.

# IRSE Consolidated Accounts

## THE INSTITUTION OF RAILWAY SIGNAL ENGINEERS NOTES TO THE CONSOLIDATED ACCOUNTS FOR THE YEAR ENDED 31<sup>st</sup> DECEMBER 2016

### 1 Investments Group

	Equities £	Government Securities £	Total £
Market value			
At 1 January 2016	1,141,124	110,075	1,251,199
Additions	141,114	22,002	163,116
Disposals	(67,905)	(34,500)	(102,405)
Revaluations	121,271	19,014	140,285
At 31 December 2016	1,335,604	116,591	1,452,195

Investments at market value are split between the funds and trading subsidiary as follows:

	Equities £	Government Securities £	Total £
IRSE Main fund	632,123	56,534	688,657
Scholarship fund	-	5,974	5,974
Frank Hewlett bequest	338,194	24,250	362,444
Alan Fisher Memorial fund	17,800	1,825	19,625
Thorrowgood Scholarship bequest	-	8,291	8,291
Robert Dell bequest	-	19,717	19,717
Trading subsidiary	347,487	-	347,487
	1,335,604	116,591	1,452,195

### Charity

	Subsidiary Company £	Equities £	Government Securities £	Total £
Market value				
At 1 January 2016	4,415	888,829	110,075	1,003,319
Additions	-	44,368	22,002	66,370
Disposals	-	(32,206)	(34,500)	(66,706)
Revaluations	-	87,125	19,014	106,139
At 31 December 2016	4,415	988,116	116,591	1,109,122

The company holds 20% or more of the issued share capital of the following company:

<u>Company</u>	<u>Country of incorporation</u>	<u>Share class</u>	<u>%age owned</u>
IRSE Enterprises Limited	England and Wales	Ordinary	100

	<u>Share capital and reserves</u>	<u>Profit for year</u>
IRSE Enterprises Limited	£86,944	£39,526

### 2 Stock

	Group 2016 £	Group 2015 £	Charity 2016 £	Charity 2015 £
Goods for sale and presentation items	56,427	63,013	51,514	53,277

### 3 Debtors

	£	£	£	£
Trade debtors	115,841	78,594	1,524	4,627
Recoverable VAT	7,802	7,496	7,802	7,496
Other debtors	63,885	54,052	4,443	2,223
Amounts owed by group undertakings	-	-	307,141	296,955
	187,528	140,142	320,910	311,301

### 4 Investments held as current assets

	£	£	£	£
National Savings	205,511	203,911	205,511	203,991
	205,511	203,911	205,511	203,911
The investments are split between the funds as follows:				
IRSE Main fund	163,748	162,538	163,748	162,538
Scholarship fund	33,410	33,162	33,410	33,162
Thorrowgood Scholarship bequest	8,353	8,291	8,353	8,291
	205,511	203,991	205,511	203,991

# IRSE Consolidated Accounts

<b>5</b>	<b>Creditors: amounts falling due within one year</b>	<b>Group 2016 £</b>	<b>Group 2015 £</b>	<b>Charity 2016 £</b>	<b>Charity 2015 £</b>
	Trade creditors	68,059	73,767	63,735	69,550
	Subscriptions received in advance	151,051	163,216	151,051	163,216
	Other taxes and social security costs	6,748	2,923	-	-
	Other creditors	234,234	27,014	32,323	24,059
	Deferred income and accruals	9,891	197,539	-	-
		<b>469,983</b>	<b>464,459</b>	<b>247,109</b>	<b>256,825</b>
<b>6</b>	<b>Creditors: amounts falling due after one year</b>	<b>£</b>	<b>£</b>	<b>£</b>	<b>£</b>
	Deferred income	292,084	300,115	-	-
Representing the proportion of licence fees receive which will be credited to Income after more than one year.					
<b>7</b>	<b>Activities of the trading company</b>			<b>2016 £</b>	<b>2015 £</b>
	Income from fundraising activities:				
	Conventions			59,350	63,069
	ASPECT Conference			-	68,985
	Dinners			49,071	48,739
	Technical visits and seminars			24,860	9,466
				<b>133,281</b>	<b>190,259</b>
	Direct expenditure of fundraising activities:				
	Conventions			72,629	65,555
	ASPECT Conference			-	67,605
	Dinners			27,238	29,838
	Technical visits and seminars			14,740	9,164
				<b>114,607</b>	<b>172,162</b>
	Licensing Scheme: Income from fundraising activities				
	Licence fees received			245,456	213,467
	Appraisal fees received			55,138	65,771
	Assessing agent fees			86,735	96,250
	Technical publications			12,830	20,756
				<b>400,179</b>	<b>396,244</b>
	Licensing Scheme: Direct expenditure of fundraising activities				
	Licence Registrar's services and offices			210,133	157,891
	Appraisal Engineers' fees			13,076	14,680
	Logbooks			84,983	60,068
	Accreditation			4,823	5,404
	Licensing audit fee			8,799	10,605
				<b>321,814</b>	<b>248,648</b>
	Licensing Scheme: Expenditure on charitable activities			59,134	61,464
	Other expenditure on charitable activities			22,893	16,097
				<b>82,027</b>	<b>77,561</b>
	Net income			15,012	88,132
	Net gains on investments (including fair value adjustments)			33,709	1,300
	Income from investments			5,380	3,756
	Interest received			2,156	1,353
	Amount gift aided to charity			(16,731)	(89,485)
	Retained in subsidiary			39,526	5,056
	Fixed assets			1	1
	Investments			347,487	252,295
	Current assets			561,555	599,826
	Current liabilities			(530,015)	(504,589)
	Long term liabilities			(292,084)	(300,115)
	Total net assets			<b>86,944</b>	<b>47,418</b>
	Share capital and reserves			<b>86,944</b>	<b>47,418</b>

# IRSE Consolidated Accounts

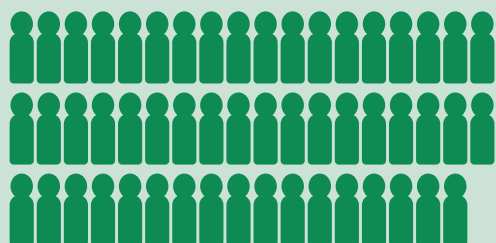
<b>8</b>	<b>Voluntary income: Group</b>		<b>2016</b>	<b>2015</b>
			£	£
	IRSE Main fund			
	Donations		795	2,505
	Subscriptions received:	Arrears	24,708	30,356
		Current	371,250	353,041
	Scholarship fund: Donations		-	400
			<b>396,753</b>	<b>386,302</b>
<b>9</b>	<b>Activities for generating funds: charity</b>		£	£
	IRSE Main fund:			
	Advertisements		16,635	29,300
	Sundry sales:	Booklets and text books	6,795	14,589
		IRSE ties, badges & cufflinks	434	227
	Examination Fees and materials		21,029	33,292
	Gross proceeds of functions for generating funds:	Dinners	1,035	1,027
			<b>45,928</b>	<b>78,435</b>
<b>10</b>	<b>Investment income - Group</b>		£	£
	Fixed asset investments	Equities and Government stocks	22,112	17,888
	Current asset investments	Interest receivable on cash deposits	19,754	16,222
			<b>41,866</b>	<b>34,110</b>
	Split between the funds as follows:			
	IRSE Main fund		23,705	19,539
	Scholarship fund		320	141
	Alan Fisher Memorial/Frank Hewlett bequest funds		9,539	8,693
	IRSE Enterprises (Trading Company)		7,536	5,109
	Thorrowgood Scholarship bequest		766	155
	Robert Dell bequest		-	473
			<b>41,866</b>	<b>34,110</b>
<b>11</b>	<b>Expenditure on raising funds: charity</b>		£	£
	IRSE Main fund:			
	Proceedings: editing, printing and distribution		2,773	8,734
	Newsletter: editing and printing		65,637	66,357
	Printing of technical papers and blocks		160	430
	Booklets and textbooks	Opening stock	48,212	46,854
		Purchases	-	9,597
		Closing stock	(45,528)	(48,212)
			<b>2,684</b>	<b>8,239</b>
	IRSE ties, cufflinks and badges	Opening stock	758	858
		Purchases	103	146
		Closing stock	(978)	(758)
			<b>(117)</b>	<b>246</b>
	Prizes		556	-
	Direct costs of functions for generating funds: Dinners		4,295	3,941
	Thorrowgood medals		24	-
	Activities funded by country subscription supplements		20,881	18,903
			<b>96,893</b>	<b>106,850</b>
<b>12</b>	<b>Expenditure on charitable activities: charity</b>		£	£
	IRSE Main funds	Office rent and services	19,693	20,469
		Fees and honoraria	42,339	29,384
		Payroll costs	94,871	99,436
		Auditors' fees	3,850	3,525
		Investment manager's fees	4,200	3,611
		Depreciation	32,651	ÿ ÿ
		Membership database project	12,398	70,831
		Other administrative costs	129,082	163,872
			<b>339,084</b>	<b>392,191</b>
	Scholarship	Award	200	710
	Thorrowgood Scholarship	Award	1,500	1,455
	Robert Dell bequest	Award	300	300
	Alan Fisher Memorial/Frank Hewlett bequest	Awards	12,811	16,377
		Investment manager fees	2,861	2,661
			<b>356,756</b>	<b>413,694</b>

# The IRSE in numbers

# 5365

members

in **54** countries

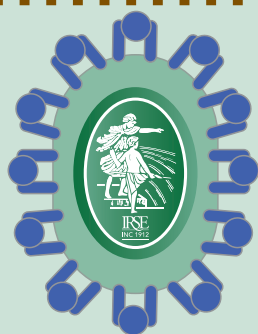


// THE **PROFESSIONAL ENGINEERING INSTITUTION** FOR ALL THOSE ENGAGED OR INTERESTED IN **RAILWAY SIGNALLING, CONTROL AND COMMUNICATIONS AND ALLIED DISCIPLINES** //

# 20

**sections**

in **13** geographical areas of the world plus a vibrant international **Younger Members'** section



Run **by our members** for our **members**, governed by elected international Council

## Committed

to **equality, diversity** and **inclusion**, treating all staff, volunteers and members equitably and fairly

Over **100** events including **presentations, seminars, conferences** and **technical visits** every year



**11** issues of **IRSE NEWS** every year: our specialist railway signalling control and communications magazine



[www.irse.org](http://www.irse.org)  
Visit our website  
to learn more  
about us.



# INDEX OF IRSE NEWS CONTENTS - MAY 2016 to APRIL 2017

<b>IRSE NEWS 222 - May 2016</b>	<b>Author/Presenter</b>	<b>Page</b>
Presidential Address: Inform, Discuss, Develop	Charles Page	2
Rail Week — your journey starts here	Helen Kellaway	7
Thorowgood scholar study tour: Germany, The Netherlands and Switzerland	David Harrison	8
Have we forgotten the driver — again?	Peter van der Mark	13
Industry News		15
IRSE Matters		17
News from the IRSE		17
IRSE membership subscription rates		18
CPD — more than just technical knowledge?		18
The IRSE professional examination 2015, Examination application process 2016		19
French Section Technical Conference: The Greater Paris Express rapid-transit scheme		20
Midland & North Western Section: Telecomms extravaganza		22
Swiss Section: Spring meeting and AGM		24
Feedback		Back Cover

<b>IRSE NEWS 223 - June 2016</b>	<b>Author/Presenter</b>	<b>Page</b>
The retrospective application of EN50128 to software-based systems	Peter Sheppard, Mike Ainsworth and Mark Coates	2
Introducing SafeCap, a safety-focused tool for optimising route capacity	Alexander Romanovsky and Alexei Illiasov	7
Industry News		11
IRSE Matters		12
News from the IRSE		12
Report on the IRSE Annual General Meeting and Dinner		13
International Technical Seminar, Tokyo		15
International Technical Convention 2016: Back from Beijing . . . are you going?		19
CPD — benefit or chore?		20
Australasian Section: Annual General Meeting		20
Midland & North Western Section: March meeting; Hitachi ERTMS/ETCS and Traffic Management developments		Back Cover

<b>IRSE NEWS 224 - July/August 2016</b>	<b>Author/Presenter</b>	<b>Page</b>
Signalling principles of Australian Rail Track Corporation	Trevor Moore	2
Rethinking switches to boost reliability	Roger Dixon and Sam Bemment	11
Industry News		14
IRSE Matters		14
News from the IRSE		15
Systems Engineering for Train Control and Comms Seminar		16
Australasian Section: Autumn Technical Meeting		22
Midland & North Western Section: AGM and Technical paper — Birmingham Trams Network		25
York Section: March Technical Paper – Thameslink		26
Past lives: John Boura		28
Membership Matters		15, 29 and Back Cover

<b>IRSE NEWS 225 - September 2016</b>	<b>Author/Presenter</b>	<b>Page</b>
---------------------------------------	-------------------------	-------------

# INDEX OF IRSE NEWS CONTENTS - MAY 2016 to APRIL 2017

Chinese train control system principles	Dr Jidong Lu, Dr Lei Chen, Prof Tao Tang and Dr Ning Zhao	2
Improving safety at level crossings – JR East developments	Takashi Kawano	6
UK Railway Safety & Standards Board research into 'Closer Running'	David Fenner	11
Industry News		16
IRSE Matters		18
News from the IRSE		18
IRSE Members' Luncheon 2016		19
Network Rail apprenticeship and IRSE-Signet awards		20
Thailand Section: Inauguration ceremony		21
Swiss Section: ERTMS in Denmark and the UK – and relay risks in Europe		22
Younger Members: IRSE Exam study day, Younger Members' International Technical Visit to Lisbon and Next Generation Rail Conference: where knowledge creates solutions, Exam facts		26
Past lives: Victor Smith		32
'IRSE NEWS' News		32
Membership Matters		10 and Back Cover

## IRSE NEWS 226 - October 2016

	Author/Presenter	Page
The evolution of signalling technologies in Hong Kong	Philip Wong Wai Ming	2
Seven myths of railway systems engineering	Bruce Elliott, Clive Roberts, Felix Schmid and Ian Shannon	11
The future of Signal Post Telephones – an engineer's view	Lee John Allen	15
ETCS level 2 meets existing interlockings – a challenge?	Rod Muttram and Beat Keller	18
Cyber-Security — The Network and Information Security Directive (NIS) and the legal position in the UK	Clive Kessell	23
Industry News		25
IRSE Matters		27
News from the IRSE		27
All change please! How apprenticeships in England are changing for the better		28
Minor Railways Section: Technical visits to North Yorkshire Moors Railway and Keighley & Worth Valley Railway		29
Younger Members' Section: Exam study day		33
Membership Matters		Back Cover

## IRSE NEWS 227 - November 2016

	Author/Presenter	Page
LOOKOUT!	Anjum Naweed and Jeanette Aitken	2
Securing the Digital Railway	Christos Voudouris and Peter Gibbons	9
Learning from a recent accident: Bad Aibling	Peter van der Mark	14
Industry News		16
ASPECT 2017: Call for papers		19
IRSE Matters		20
How your Council is selected		21
Life on IRSE Council		22
Midlands & North Western Section: Section lunch on the East Lancashire Railway		23
North American Section: IRSECON17		24
Minor Railways Section: Sixth annual signalling maintenance and inspection technical workshop		26
Younger Members Section: Visit to Aldwych Station, London		27

# INDEX OF IRSE NEWS CONTENTS - MAY 2016 to APRIL 2017

Feedback	28
Membership Matters	29

<b>IRSE NEWS 228 - December 2016</b>	<b>Author/Presenter</b>	<b>Page</b>
Implementation of risk-based rail asset management : a case study	Jan Swier	2
Industry news		9, 22
ETCS beyond systems engineering	Oskar Stalder and Markus Bolli	10
Developments in the signal sighting assessment process	Richard Barrow	13
Fifty years ago	Stephen Clark	20
IRSE Matters		23
News from the IRSE		23
IRSE Convention 2016 - Beijing		24
Beijing 2016 - The bursary winners' view		29
Swiss Section: Autumn Meeting – Berlin: always worth a visit		31
Malaysian Section: Technical paper and bowling championship		31
Midlands & North Western Section: Technical paper, Borders Railway		32
Past Lives: Franco Fabbian		33
Feedback		33
On the Move		33
York Section: 2017 Annual Dinner		34

<b>IRSE NEWS 229 - January 2017</b>	<b>Author/Presenter</b>	<b>Page</b>
Resignalling the East Rail Line in Hong Kong	Andreas Steingröver	2
Control and communications asset management	Paul Darlington	11
Industry News		15, 36
The quest for system performance in Singapore resignalling project	L Y Lam	16
UK Transport Select Committee report on the Digital Railway programme	David Fenner	24
IRSE Matters		28
News from the IRSE		28
Beijing 2016: a personal view		29
China Section: A dream come true		30
Midland & North Western Section: East West Rail		31
Malaysian Section: Third anniversary		32
Minor Railways Section: Technical visit to the Bluebell Railway		33
York Section: North Eastern Railways Engineers' Forum		35
Feedback		36
Membership Matters		38

<b>IRSE NEWS 230 - February 2017</b>	<b>Author/Presenter</b>	<b>Page</b>
Low cost signalling	Andy Stringer and Graeme Christmas	2
Renewal of the tunnel control systems technology in the Lötschberg Base Tunnel	Hans Stadelmann and Oskar Stalder	8
The development of the tasks of train drivers in the future	Niels Brandenburger, Dr Anja Naumann and Dr Meike Jipp	12
Secure by design: countering cyber threats	Francis How and Robert Stroud	15
SATLOC – An innovative train control system for low traffic-density lines	Teodor Gradinariu and Burkhard Stadlmann	17
Industry News		23, 24
The changing face of IRSE NEWS		24

# INDEX OF IRSE NEWS CONTENTS - MAY 2016 to APRIL 2017

IRSE Matters	26
News from the IRSE	26
North American Section: An overview of the IRSE CBTC seminar, Toronto, December 2017	27
Midland & North Western Section: An Inspector Calls	31
Minor Railways Section: Technical seminar 2017 - call for papers	32
York Section: October and November technical papers	32
Scottish Section: Annual Dinner and November technical paper	33
Feedback	34

## IRSE NEWS 231 - March 2017

	Author/Presenter	Page
Automated testing of interlockings	John Martin and Eduardo Olleta	2
Industry news		10
The great carbon debate	Inga Doak	11
ITC Report: Aspects of producing a business case for ERTMS	Rod Muttram	16
Presidential visit to Southern Africa Section	Charles Page	20
IRSE Matters		24
News from the IRSE		24
Applying to take the 2017 IRSE Examination		25
Minor Railways Section: Can you help the Minor Railways Sector?		25
Midland & North Western Section: Innovations in signalling design		26
Swiss Section: Driverless trains and Zurich airport		27
Younger Members Section: Enhancing rail capacity across the UK		30
Past Lives: Fred Kerr		32
Feedback		33
Membership Matters		Back cover

## IRSE NEWS 232 - April 2017

	Author/Presenter	Page
ERTMS Level 3: the Game-Changer	Nicola Furness, Henri van Houten, Laura Arenas and Maarten Bartholomeus	2
Five operating control centres for the rail network operated by ÖBB Infrastructure	Richard Sagner and Gerhard Haipl	10
Signalling in Japan	Tom Corker	13
Saving seconds	John Francis	18
Industry News		9, 17, 21
'IRSE NEWS' News		21, 30
IRSE Matters		22
News from the IRSE		22
The IRSE professional examination 2016		23
The Signet Exam Workshop - one way to prepare for the exam		23
Introducing Judith Ward: our new Professional Development Manager		24
What is Continuous Professional Development (CPD)?		25
Indian Section: New Council Members		26
Midland & North Western Section: Future Signalling Systems by Atkins – Safety, Reliability, Availability and Performance		26
Minor Railways Section: The S&T Technician of the Year		27
York Section: An alternative to HS2? and Reading Remodelling		28
Feedback		31
Membership Matters		34

## **IRSE PROCEEDINGS 2016 – 2017**

### **Summaries of Papers read at Presidential Programme Technical Meetings**

Each year the President of the IRSE invites six keynote speakers to produce papers and presentations on selected topics. Traditionally these have been presented in London, although in more recent years other locations have been used as well.

In 2016-17 the papers and speakers were as follows (a summary of each appears on the following pages, together with a summary of the discussion that followed, where available):

**1. ‘The evolution of signalling technologies in Hong Kong’**

*by Philip Wong Wai Ming, General Manager, Technical & Engineering Services, MTR Corporation Ltd, presented on 26 August 2016 in Hong Kong (published in IRSE NEWS October 2016).*

**2. ‘Implementation of risk-based rail asset management: a case study’**

*by Jan Swier, Senior advisor Asset Management ProRail BV, Utrecht, Netherlands, presented on 9 November 2016 in London (published in IRSE NEWS December 2016).*

**3. ‘Resignalling the East Rail Line in Hong Kong: technical challenges and solutions’**

*by Andreas Steingröver, Senior Principal Key Expert Rail Automation Solutions, Siemens AG, Germany, presented on 6 December 2016 in London (published in IRSE NEWS January 2017).*

**4. ‘Low cost signalling’**

*by Andy Stringer (Siemens Rail Automation) and Graeme Christmas (Network Rail), presented on 10 January 2017 in London (IRSE NEWS February 2017).*

**5. ‘Automated testing of interlockings’**

*by John Martin and Eduardo Olleta (Atkins), presented on 8 February 2016 in London (IRSE NEWS March 2017).*

**6. ‘ERTMS Level 3: the game-changer’**

*by Nicola Furness and Laura Arenas (Network Rail), Henri van Outen and Maarten Bartholomeus (ProRail, Netherlands), presented on 14 March 2017 in London (IRSE NEWS April 2017).*

**‘The evolution of signalling technologies in Hong Kong’**

*by Philip Wong Wai Ming, General Manager, Technical & Engineering Services, MTR Corporation Ltd, presented on 26 August 2016 in Hong Kong (published in IRSE NEWS October 2016).*

The railways in Hong Kong have been operating for more than one hundred years, and throughout the years signalling technology on the various lines has been evolving. The purpose of this paper is to describe the evolution of signalling technologies in Hong Kong, covering mechanical signalling, colour-light signalling, speed code, distance-to-go (DTG) and communication based train control (CBTC).

The paper also describes the two major signalling replacement projects in 1993-1999, covering replacement of speed code technology by DTG, and the latest CBTC technology adopted in the replacement of signalling systems on eight existing metro lines since 2013. In addition, the paper provides brief technical information on the CBTC system adopted for the new fully automatic line being commissioned, and the Chinese Train Control System (CTCS) technology to be adopted for the Express Rail Link connecting Hong Kong and mainland China.

In Hong Kong there are ten metro lines and one light rail line operated by MTR Corporation Limited. The whole railway network, with a total route length of 221km, carries around 5.5 million passengers every day. Since the railways in Hong Kong were built in different years, signalling technologies vary from line to line. Technologies have evolved, with distance-to-go (DTG) currently being deployed on seven lines (EAL, TWL, ISL, KTL, TKL, AEL and TCL), and communication based train control (CBTC) on three lines (WRL, MOL and DRL).

Looking ahead, CBTC will replace DTG technology in Hong Kong. In the new generation of radio based CBTC systems, availability will be a focus in addition to system throughput and operational flexibility. This is the key driver for incorporating triple redundancy into the current CBTC implementation on the DUAT lines.

**Discussion:**

*No record was made of the discussion at this meeting.*

### **'Implementation of risk-based rail asset management: a case study'**

*by Jan Swier, Senior advisor Asset Management ProRail BV, Utrecht, Netherlands, presented on 9 November 2016 in London (published in IRSE NEWS December 2016).*

Asset management is a hot topic in the rail industry. There is much talk about it, but people often have trouble in articulating what it is, how it is done and what is really new in the field. Cost reductions and performance improvement are promised, but it is unclear how it is realised and what the results are. This paper is a case study of the development of asset management by ProRail, the infrastructure asset manager in the Netherlands. It describes what ProRail considers as the essence of asset management, what the challenges are and what the most critical milestones were in its development.

ProRail is the independent infrastructure manager of the Dutch rail network. It is purely an asset manager and has outsourced all executive activities, including maintenance. The role and the outsourcing strategy have forced ProRail to develop new skills, instruments, processes and procedures to manage maintenance and renewal. Key was the way performance is specified and controlled in levels depending risk. Risk management provides the organisation with an indispensable tool for control of performance and costs over the life cycle explicitly and coherently, and for collecting knowledge of maintenance and renewal issues.

For ProRail it all started in the 1990s when train operations and railway infrastructure were separated. A pure asset management organisation was born, and all ground-based activities were outsourced in the same period. The EU introduced competition to the railway markets by separating previously monopolistic train operations and rail infrastructure management in order to improve performance and decrease costs. In 1995, Nederlandse Spoorwegen (NS) was the only railway company on the Dutch rail network; twenty years later there are more than thirty, including passenger and freight operators, and contractors. From the beginning the Dutch government has opted for a full, legal and administrative separation of trains and infrastructure. The business relationship is regulated in an institutional triangle between Government, Operators and the Infrastructure Manager.

Today the triangle functions well, but only after overcoming and learning from an unstable and turbulent initial period. Punctuality dropped in the period 1995-2001 from 85% to <80% (delays of more than three minutes) and technical asset failures affecting trains grew from 5500 to more than 8000 in the same period. This happened because the orientation and focus of all infrastructure parties had to change significantly: from techniques to business goals, and from informal, task-oriented contacts to formal, result-oriented contracts. A complicating factor was the decision to outsource all execution activities of the infrastructure manager such as engineering, material supply, personnel safety, training and maintenance. As a consequence all associated knowledge and experience disappeared from the company. ProRail became purely an asset manager, entirely dependent on the quality of the service providers and of the information from inspections, reports and systems.

### **Discussion:**

No record was made of the discussion at this meeting.

**‘Resignalling the East Rail Line in Hong Kong: technical challenges and solutions’**

*by Andreas Steingröver, Senior Principal Key Expert Rail Automation Solutions, Siemens AG, Germany, presented on 6 December 2016 in London (published in IRSE NEWS January 2017).*

Steadily increasing demands for public transport in Hong Kong require both continuous extension of the railway network and modernisation of the signalling and control system. A brief overview of the evolution of signalling technologies in Hong Kong has already been presented by Philip Wong of MTR as part of the 2016-17 Presidential Programme (August 2016).

This paper focuses on the ongoing re-signalling of the East Rail line in Hong Kong. After an overview of the East Rail line and a summary of the main requirements and conditions, it presents the architecture of the new Communications Based Train Control System (CBTC), and the migration strategy that was adopted. Systems engineering and systems assurance aspects are covered throughout the paper wherever they are applicable.

The migration strategy chosen for the re-signalling of the East Rail line in Hong Kong evolved so as to deliver what was promised at the outset. The complete deployment of the new signalling and control system has concentrated on the final system configuration, and the existing signalling and control system was only touched where inevitable. This strategy, which also included dual-fitting of rolling stock, helped to reduce risks arising from modification of other manufacturers’ systems, and thus to ensure reliable train operation throughout the whole migration period.

The existing East Rail line has about 41 km of double track currently, connecting Lo Wu and Lok Ma Chau in the north of the Territories with Hung Hom at the south of the Kowloon peninsula (Figure 1). It connects the new towns in the eastern New Territories with the urban area, and also offers through inter-city services between Hong Kong and the mainland, and as a result has the highest patronage of all railway lines in Hong Kong. The eleven stations of the line each have two, three or four platforms, and some have sidings or yards as well. The terminal station at Lo Wu has lines connecting to mainland China to allow regional trains from Guangzhou or long-distance trains from Beijing to run through to Hung Hom. However the main service is provided with 12-car commuter trains, which only operate on East Rail.

The existing signalling and control system has been enhanced step by step in the past to provide the required operational flexibility and performance. Further improvement of headway performance of the existing signalling and control system has been limited by the use of fixed block for train separation. Maintainability is limited by electronics being distributed among PEMs along the line.

The re-signalling and extension project was therefore launched in order to meet increasing traffic demands on the East Rail line in 2012. The specification for the re-signalling and extension project requires communication based train control (CBTC) with moving block, and object controllers for control of field elements to be concentrated in new signalling equipment rooms at each station.

## **Discussion:**

*The discussion was opened by **an unidentified speaker** from TfL who asked how the external systems had been integration tested. Hr. Steingröver explained that any external interfaces had been tested using contacts to simulate the various inputs within the system test environment.*

***C. Porter (Past President)** thought that the speaker had intimated that these external facilities were going to be commissioned after the signalling system and wondered why they were tested at this stage. Hr. Steingröver confirmed that this was the case but testing was undertaken to incorporate all of the required features in the final configuration to negate the need for a later software change.*

***W. Coenraad (Movares)** questioned if the over-and-back testing was controlled by the new signalling system and what process was taken to ensure that the existing signalling was working correctly after these over-and-back tests. Hr. Steingröver clarified that the over-and-back-testing was controlled by a manual key switch located in the equipment rooms – the next step would be to control this from the new signalling system. Initially over-and-back testing started using just one piece of infrastructure and, as confidence in the process grew, larger areas were switched over. He pointed out that it was essential that the existing equipment was proven to operate correctly following this testing and before the system was returned to operational use.*

***An unidentified speaker** from TfL asked how the Wi-Fi bearer network requirements were proven. Hr. Steingröver explained that the Wi-Fi network simply used IP addressing and the radio network was designed to work using this method of communication with redundancy principles to ensure reliable operation. He also recognised that interference from other external sources had been considered.*

***C. Porter (Past President)** questioned why the new trains were only 9-car whereas the old trains were 12-car. Hr. Steingröver explained that whilst this seemed strange, introduction of the new signalling actually increased overall system capacity. Additionally, this was to cater for those stations in the new tunnel section which were only built for 9-car trains.*

***T. Foulkes (retired)** wanted to know how the old cabling would be recovered as the new cabling had been laid on top. Hr. Steingröver was unsure how this was going to be managed but thought that the majority of redundant cables would not be too difficult to recover because of the relatively short lengths involved.*

***I. Mitchell (Resonate)** wanted to know if the opportunity had been taken to simplify the control tables and data constructs used within the existing SSI or if everything had simply been transferred to the new software. He also wanted to know if there were any freight trains using the system. Hr. Steingröver advised that simplification had taken place although this had not been possible for every layout; he also reported that there were some freight and engineering trains using the network.*

**C. Porter (Past President)** asked if the main line trains would still be signalled using the existing 4-aspect signals supported by AWS but controlled by the new signalling. Hr. Steingröver confirmed that the new signalling system could cope with both conventional and CBTC-fitted trains.

**M. Cover (Crossrail)** noted that moving block functionality and also track circuiting was being provided and asked which performed the primary role of providing the movement authority. Hr. Steingröver explained that for fitted trains the On-Board Position report is utilised but for non-fitted rolling stock, train detection was used – if all trains were fitted, train detection would not be required.

**D. Hotchkiss (RSSB)** questioned if the CBTC fitted-trains could be signalled using the conventional signalling if the (CBTC) equipment failed. Hr. Steingröver pointed out that if the CBTC system failed the fitted trains could not continue running as they are not AWS-fitted, however, the system architecture was designed to prevent a failure of this nature.

**T. Foulkes (retired)** wanted to know what steps had been taken to prevent malicious interference with the Wi-Fi network. Hr. Steingröver thought that application of directional antennae should overcome this possibility.

**An unidentified speaker** asked for information on the changeover facilities used and how route releasing was achieved under emergency conditions. Hr. Steingröver explained that safety critical relays were used such that the two systems could not be connected together. All route releasing was controlled by the interlocking.

**W. Coenraad (Movares)** wanted to know what cyber security measures had been incorporated within the system. Hr. Steingröver confirmed that encryption was included within the radio messaging and that the computers had included measures to counter any cyber-attacks - these had also been considered as part of the system safety case.

**C. Porter (Past President)** asked if the telecommunications used private or public networks. Hr. Steingröver advised that no public networks were used – the networks were all railway owned.

**C. Porter (Past President)** thanked the speaker for his interesting paper on a fascinating project.

### **‘Low cost signalling’**

*by Andy Stringer (Siemens Rail Automation) and Graeme Christmas (Network Rail), presented on 10 January 2017 in London (IRSE NEWS February 2017).*

The authors of this paper set out to make signal engineers think differently about what they do and about how to approach whatever involvement it is that they have with railway signalling. It is not a technical paper packed with complex principles, or a catalogue of the industry’s issues. It is an alternative point of view, that the authors hope will lead to positive conversations which develop into tangible actions. The views expressed are those of the authors, and not necessarily those of their employers.

Low cost signalling means many things to many people. It would have been easy to give a technical briefing on the latest developments on low cost architectures for secondary routes, but that would be to miss an opportunity to discuss some of the really big issues that will affect the future of railway signalling, particularly in Great Britain. There is a harsh reality that we have been managing to avoid for a few years now, but that we really need to stand up and address: we can no longer afford to pay for signalling systems at current rates.

“Have we forgotten the driver” is perhaps one of the most iconic papers in the Institution’s 100-year history. Taking the concept one step further – “Have we forgotten the customer?” There are only two real sources of funding: the taxpayer and the passenger. In this paper the authors discuss the typical rail journey and the impact on the passenger of signalling – both the expensive parts and the less expensive.

Low cost is not a simple solution, nor is it a ‘one size fits all’ solution. Great Britain has an amazingly diverse railway network with a vast array of bespoke solutions making it all work. In the future we need to ensure that we bring those bespoke and varied solutions into a smaller number of generic applications, and to do so, we need to think as system engineers and to ensure that we lead from the front. This will rely upon relentless attention to detail across the whole range of the signalling system.

#### **Discussion:**

*The discussion was opened by **D. Hotchkiss (RSSB)** who noted that safety features were often provided as a result of one specific incident and asked the speakers if they thought this was good value for money. Mr. Stringer thought that we tend to address risks that have happened rather than looking at the holistic risks. Mr. Christmas believed that it was, and should be, possible to justify not including every safety feature within a re-signalling scheme.*

***T. Foulkes (retired)** questioned why, on main line systems, we were still installing lineside signals and not ERTMS Level 3. Mr. Stringer pointed out that metro systems tended to be very predictable whereas the main lines are incredibly complex with many variables; he believed that the current signalling systems did a pretty good job and would probably remain in service for some time to come - the key is to deliver these systems as economically as possible.*

***S. Murton (Atkins)** believed that the travelling public should be entitled to expect that lessons have been learnt and solutions incorporated within the safety systems. Mr. Stringer*

*agreed that passengers had a right to believe that they would expect to arrive safely but they shouldn't have to pay extra for risks that are unlikely to happen; he did agree though, that, we are very risk averse.*

**R. Muttram (retired)** wondered if employers would defend informed decisions that are undertaken by their engineering employees. Mr. Christmas hoped that engineering decisions would be supported by the employer. **P. Woodbridge (Siemens)** thought that a lot of problems arose from inaccurate specifications produced during the development stages.

**F. How (IRSE)** believed that this was an example of taking the easy option and not an engineering decision. Mr. Stringer pointed out that these decisions have been made by somebody who believes that they are doing the right thing and, therefore, support should be provided for those undertaking these roles as necessary.

**L. Hunter (Network Rail)** asked how much money would be saved if a return to British Rail could be achieved and there was no client/contractor relationship. Mr. Stringer didn't think that renationalisation would actually help – it's getting things right first time that would make the savings and also reduce the risks associated with re-work cycles.

**C. Porter (Past President)** related the cost of recently moving one signal to be one million pounds.

**J. Poré (Alstom)** noted that the speakers had not referred to 'cross-acceptance' and 'benchmarking'. Mr. Stringer agreed that there was a risk of the rail industry pricing itself out of the market especially where railways only tend to be a part of an overall end-to-end journey.

**J. Cox (Atkins)** thought that the briefing-out of every single incident, no matter how trivial, was losing the impact of those incidents that were serious. He also felt that consultation with the different parties was an avoidance of managing the risk and not taking responsibility. Mr. Stringer agreed that individually we can't solve this problem but collectively, as engineers, we can. Mr. Christmas also believed that a lot of experience has not been passed on and staff need to be educated in application of the standards and assessment of unknown risks.

**F. How (IRSE)** thanked the speakers for their stimulating and thought-provoking paper.

### **'Automated testing of interlockings'**

*by John Martin and Eduardo Olleta (Atkins), presented on 8 February 2016 in London (IRSE NEWS March 2017).*

The automation of design and testing for signalling systems is the focus of considerable interest and effort at present and the production of software for an interlocking signalling controller which is compliant with BS EN50128 brings new challenges to the signalling industry. This paper examines the process designed by Atkins for the production and testing of software for a SIL4 signalling interlocking controller in accordance with BS EN50128.

The software production and testing process has to demonstrate the adherence of the software to the requirements, but also has to comply with the safety integrity level required for the interlocking system. This paper also covers the use of formal methods and modelling techniques to help the production of the test specifications, allowing the software tester to use test coverage and proving techniques for the validation of the software. The paper does not detail every aspect of the process, but is intended to promote discussion as the industry makes the transition into the digital age.

When Atkins embarked upon the introduction of a new signalling interlocking product called ElectroLogiXS™, it set out to make a robust safety argument and to create a process, methods and techniques which could replace the current manual software testing processes with an automated process and resolve some of the issues identified in this paper.

The introduction of requirements-based software design and model-based design techniques, in accordance with BS EN50128, represents an improvement in safety assurance when compared with a traditional SSI software production process. These techniques also allow automation of the software production and testing process. When combined with the design of reusable signalling software components, they will increase the efficiency of the software production and testing process for all future projects.

#### **Discussion:**

*The discussion was opened by **S. Gibbon (Siemens)** who asked how all of the different external interfaces would be tested using the model. Sr. Olleta explained that the system object controllers provide an interface between the interlocking and the external lineside equipment and it is the intention to standardise all of the known interfaces.*

***I. Mitchell (Resonate)** noted that because the interlocking data and test data were both derived from the (same) signalling control tables, there was a risk that a common mode error would not be detected during the testing process. Sr. Olleta agreed that the information was all derived from the signalling control tables, however, the safety control requirements utilise a different process to generate the criteria.*

***A. Bishop (Principles Tester)** pointed out that other systems only really test the geographical data, normally derived from the control tables, and was trying to understand how automation of the process was any different to what happens currently and thought that it was more of a set to work process. Sr. Olleta clarified that the objective was not to (specifically) resolve signalling control table issues but to utilise an independent process to*

*validate that all of the safety requirement conditions had been incorporated within the interlocking software; this independent process would utilise competent staff to generate the test scripts and oversee the outputs.*

**A. Beavours (Network Rail)** wanted clarification on which documentation was the last element manually produced by a 'Signal Engineer'. Sr. Olleta confirmed that production of the requirements from the defined inputs would be manually produced by a competent Signal Engineer – software engineers then take the process forward.

**An unidentified speaker** from Siemens asked exactly what 'the requirements' were and who produced these. Mr. Martin clarified that the generic requirements included Group and Line Standards together with typical circuits and data constructs whilst the project specific requirements included the Signalling Scheme Plan and Control Tables. Sr. Olleta explained that production of the requirements had used an incremental approach slowly incorporating more and more of the relevant standards.

**M. Stubbs (retired)** wondered if the process would actually achieve a reduction in the number of key personnel required for a commissioning. Mr. Martin agreed that the initial use of this process would involve an element of duplication of effort but, as confidence in the process grew and was proven in practice, this duplication would be reduced. He also noted that there would always be a need for some form of on-site integration testing.

**G. Dodds (Alstom)** questioned if use of the automation tool would test differing scenarios that may occur in real life, such as equipment response times or differing speeds of trains, to determine if there were issues with minor and major cycle times. Sr. Olleta explained that the model was run on both minor and major cycles in line with the target hardware to test the stability of the data and communication channels.

**An unidentified speaker** from the University of Technology of Japan asked how it was ensured that the safety requirements had been correctly defined. Sr. Olleta advised that the process defined in EN50128 was followed using SIL 4 algorithms together with all of the required internal and external Safety Assessments.

**P. Duggan (Siemens)** wanted to know what process was in place to satisfy the Tester In Charge that the system was safe to sign into service. Mr. Martin reinforced that it would be necessary to initially run both processes in parallel to build up confidence, supported by the ISA and Software Verifiers.

**An unidentified speaker** from Thales asked what challenges were faced in splitting the operational and safety requirements. Sr. Olleta agreed that this was not an easy task to achieve and would need to be decided on a project-by-project basis.

**P. Davies (Atkins)** wondered if there would be a point in time when Signalling Control Tables would not be required and each administration had their own generic requirements that could be simply issued to the designers with the Scheme Plan. Sr. Olleta noted that one of the challenges was the vast number of signalling principles in use in the UK but that, in theory, it should be possible.

**R. Short (retired)** questioned why ladder logic was chosen. Sr. Olleta believed that ladder logic was analogous in operation to relay logic and there were also 'Commercial off the Shelf' tools available.

**C. Page (President)** thanked the speakers for their fascinating paper.

### **‘ERTMS Level 3: the game-changer’**

*by Nicola Furness and Laura Arenas (Network Rail), Henri van Outen and Maarten Bartholomeus (ProRail, Netherlands), presented on 14 March 2017 in London (IRSE NEWS April 2017).*

Conventional lineside signalling systems have been optimised to their limits. In many locations the use of conventional methods to increase capacity such as building extra tracks, flyovers and introducing larger trains has been exhausted. But there is an alternative – use of digital technology. This provides a great opportunity to deliver increased capacity for our networks.

A key digital technology which can provide this is ERTMS. Currently most worldwide implementations of ERTMS are of ETCS Level 1 and ETCS Level 2 systems. Of these it is ETCS Level 2 which can, with careful implementation, provide improvements in capacity. To get significant improvements in capacity from ETCS Level 2 means increasing the amount of trackside train detection systems. This is clearly technically feasible, but is it affordable?

Moving to ERTMS Level 3 solves this problem. ERTMS Level 3 can deliver better capacity, reduce costs, improve flexibility and increase reliability in comparison with ERTMS Level 2, removing reliance on train detection equipment. During European level discussions on the ERTMS long term perspective plans, ProRail and Network Rail identified strong and similar interests in the development of ERTMS Level 3 as part of their commitment to increase capacity on main line railway networks. ProRail and Network Rail agreed to take a joint approach on the definition of an effective path to deploy ERTMS Level 3. The types of Level 3, which are at different levels of maturity in terms of definition and development, have been named as follows:

- Level 3 Overlay.
- Level 3 Hybrid.
- Level 3 Virtual block.
- Level 3 Moving block.

Of these, Hybrid Level 3 is the most mature and is defined in detail in this paper. Hybrid Level 3 has been developed as a type of Level 3 which mitigates the Level 3 challenges described above using existing technology solutions. It does this by dealing with the potential issue of insufficient train information by using a limited amount of trackside train detection. In this way this concept avoids the need for new and complex operational procedures and should secure performance when introduced. It means trains which are not able to report confirmed train integrity can still be authorised to run on the line, albeit with longer, but still acceptable, headways. Trains which are disconnected from the RBC are no longer lost. They are still visible by means of the trackside train detection, which facilitates operational movements of disconnected trains, protection against unauthorised disconnected trains, and recovery after RBC failures. In addition, in certain key locations trackside train detection should enable good performance by providing faster release of critical infrastructure (e.g. points) than on the basis of train position reports (e.g. if the position reports are delayed, or there are margins in the reported train length).

## Discussion:

The discussion was opened by **T. Foulkes (retired)** who thanked the speakers for their interesting paper and asked how they thought ERTMS could be justified on rural lines. Ms. Furness thought that the business benefit would either come about from the introduction of some form of 'train detection', where none existed today, or by providing additional capacity for those lines that already did (have train detection). Mr. van Houten advised that there was certainly an interest in investment on rural lines in Europe.

**An unidentified speaker** thought that an axle counter simply counting the axles onto and off a branch line would be sufficient. Mr. Bartholomew agreed with this but pointed out that more precise positional location of the train would still be advantageous together with proving the integrity of the train.

**P. Forbes (Siemens)** was pleased to know that implementation of ERTMS was now being taken more seriously. **J. Holmes (CH2M)** thought that there might be a possibility of trialling Level 3 in the Reading to Oxford corridor. Ms. Furness thanked the questioner for the suggestion.

**C. Kessell (Past President)** noted that the proposal included the costly retention of existing infrastructure and wondered if resources would be better invested in getting Level 3 properly established. Ms. Furness believed that it was important to build upon the knowledge and experience of Level 2 and that slight software changes would enhance the product at low risk whilst still increasing capacity. Mr. van Houten also thought that this provided a better migration strategy. Mr. Bartholomew pointed out that one of the difficulties was proving that the system always failed safe under all scenarios and this needed to be developed with all interested parties.

**An unidentified speaker** thought that this proposal would work for plain track but asked how the system would respond either with a divided train or in complex layouts. Mr. Bartholomew confirmed that train detection would be retained within areas of pointwork; if a train was to either become divided or lose radio communication, the movement would be propagated (rolled-back) to protect that movement.

**C. Porter (retired)** asked for confirmation that some form of new radio system would be required to initiate the introduction of Level 2. Mr. Bartholomew confirmed that a new radio system would be required. Ms. Furness believed that because capacity is the big driver, there would be the impetus to provide the required radio system cost-effectively without going down the avenue of installing extra train detection sections.

**F. How (IRSE)** summarised the situation by pointing out that it would be conceivable to go straight to Level 3 hybrid to get the capacity gains.

**J. Poré (Alstom)** asked, from the examples studied, the percentage of train detection sections that would be retained and also how the system would be applied in those situations where passenger traffic wasn't the main focus. Mr. van Houten believed that in complex areas such as stations, the retention of train detection would be approximately 50% with a significantly lower figure on plain-line. He thought that it may be necessary to wait until all types of train

*had been suitably equipped – one of the biggest problems been the train integrity device – although he felt that the suppliers may be enthusiastic in solving these problems.*

**H. Chan (Network Rail)** wondered how the problem of differing types of trains travelling at different speeds affecting overall capacity could be solved. Mr. Bartholomew expressed the opinion that, surprisingly, the analysis revealed that differing speeds did not have such a major impact on capacity as was first thought and that timetabling methods would overcome some of the issues.

**Two unidentified speakers** wondered if there had been any developments towards providing a cheaper form of train detection using a modern communications system if these were to be retained. Mr. Bartholomew was unsure if this had recently been investigated beyond the current track circuits and axle counters although developments were ongoing in how to declare a section clear. Ms. Furness agreed that these were very interesting suggestions and certainly the “communications” would become more important.

**J. Poré (Alstom)** thought that it may well be necessary to look outside of the rail industry for some of the required technologies.

**F. How (IRSE)** thanked the speakers for their interesting paper.

# IRSE EXAMINATION RESULTS - 2016

Surname	Forename	M1	M2	M3	M4	M5	M6	M7
Ahamed	Shabeeb	P						P
Aramalla	Divya		P					
Bennett	Oliver Thomas	P						
Bhati	Pushpendra Singh		C					
Biskupski	Adam Wlodzimierz		P					
Blakeley	Neil			P				
Calderwood	Jonathan		P					
Campbell	Ewan		C					
Challa Jayaramulu	Shravan			P				P
Chan	Chi Cheung Stephen							P
Chan	Wing Yan Karissa							P
Chari	Prem Kumar		P					
Chau	Kelvin Cheuk Lun			P		P		P
Chekkapalli	Maheswari		P					
Chou	Yen-Han		D	C				
Clapham	Andrew Daniel			P				
Cleverley	Lee Frank Thomas			P		P		
Dharani Krishna	Ronanki							P
Diamond	Anna		P					
Dixon	Andrew	P		P				
Dolby	Mark		P	P				
Duggirala	Veera Venkata Nagaraju							P
Dunsford	Ross	C						C
Earnshaw	Chezanne	P						
Edwards	Lee	P						
Farrell	Jonathan			C				
Feely	Ronan	C						
Fiori	Jonas	P		P		P		
Gardas	Srilekha		P					
Gbadegesin	Yewande							P
Gunn	Robert			P				
Harish	Sangeetha		P					
Hattersley	Matthew Edward			P				
Hay	Darren McCrae		P					
Haynes	David			P				
Heaton	James Edward							
Hedderman	Michael	P						
Hill	Daniel	P						
Ho	Io Chong (Jone)							C
Hyde	Rachel Marie	P						
Jacob	Bony						P	
Jones	Gareth	C				P		
Kaliyakannan	P Kaliyakannan		P					
Karunanithi	Ariharan	P						
Kasoju	Sridhar			P				
Kellaway	Helen		P					
Kelly	Peter Kevin	P				P		
Kennedy	Lee Francis		P					
Kwan	Kwok To Patrick			P				P
Lam	Wing Yan Heather					P		
Lau	Shui Fung		C			P		
Laver	Alexander Kenneth Thomas			C		C		
Lee	Kin Sum Augustine							P
Lorach	Natthawan			P				
Mahakijpaisal	Sira			P				
Malschuk	Jason Nicolas	P		P				
Manlove	Sharleen			P				
Maremanda	Ravi Teja							
McCann	Andrew					P		
McNulty	Michael Ashley	P	P					
Meghanathan	Nagaraj			P				
Mitchell	Glenn Thomas			P		P		
Mudyawabikwa	Stanley				P			
Munro	Andrew Alexander					P		
Murphy	Michael Edward	P						
Nwamaioha	Obinna		P					
Obidike	Uchenna		P					
O'Farrell	Patrick	P						
Or	Chin Tung David			P				C

Surname	Forename	M1	M2	M3	M4	M5	M6	M7
O'Sullivan	Michael	C				C		
Pang	Henry Chun Choi		P					
Paolozzi	Rinaldo						C	
Parnasala	Sowmya		P					
Patil	Sachin					P		
Phasoulitis	Antonis		P					
Pinner	Mark		P					
Pipet	Dorothy Anne	C						
Pokkuluri	Rajashekar Upmaka Sai	P						
Pradeep	Aswin						P	
Ramesh	Shriram		P					
Redstone	Matthew James							P
Reger	Luke		D	P				
Reilly	Andrew	C						
Robb	Duncan	D		C			P	D
Rozday	Daniel	P	C					
Shanmugaratnam	Thevjanan		P					P
Shashtry	Vishnuprasad							P
Singh	Vinay			P				
Singh	Arvinder			P				
Srisakuldee	Arnut Hung							
Srivastava	Amit Kumar			P				
Srivastava	Neha		P					
Steele	Amy		D					
Storey	Mark Robert							P
Sturton	Raymond Andrew	P						P
Teoh	Teik Hoe		P	P				
Thangamariappan	Vigneshkumar		P					
Tuohy	Peter					P		
Vargas	Manuel		P					
Velayutham	Senthilmurugan		P					
Waby	Amanda		C					
Watson	Robert							P
Westwood	Joseph		P					
Wheeler	David Francis John			P		P		
Whyte	John Paul			C				
Wilkins	Matthew	P				P		
Winfield	Ian Allan		C					
Wong	Kwok On Louis		P					
Wong Tsz Wai	Thomas		C					

## **International (non-UK) Section reports – 2016-2017**

### **LOCAL SECTION REPORTS (non-UK)**

The following reports were originally prepared by the UK's international (non-UK) Sections as a means of reporting their activities to the Institution's Council. They have been edited slightly for the purposes of providing a permanent record as part of the Proceedings 2016 – 2017.

The international Sections in existence in 2016-17 were:

Australasia  
Southern Africa  
Thailand  
Ireland  
France  
Singapore  
Malaysia  
Netherlands  
North America  
Switzerland  
China  
India  
Indonesia  
Hong Kong

## **Australasian Section report - 2016**

### **Events**

During the year, three national technical meetings of the Australasian Section and 20 local technical meetings were held. These meetings are held in each state and New Zealand on a rotational basis. The AGM is held over three days in March or April, the other national meetings being over two days. A summary of these events is given below.

#### **1. Adelaide: 8 - 10 April 2016**

The first meeting for the year started with the theme 'Railways, Smart Technologies – The Way Forward'.

This was a three-day meeting and included the 2016 Annual General Meeting. Awards presented were the Shining Light (highest achievement in Graduate Diploma) to Zdenka Wright, and the Chairman's Award to Trevor Moore.

Attendance: 110

#### **2. Perth: 15 - 16 July 2016**

The two-day meeting had a theme of 'From Growth to Optimisation' with visits to the new Perth BusPort, Claisebrook Railcar Depot and Perth Transport Centre.

Attendance: 75

#### **3. Melbourne: 11 - 12 November 2016**

The final national technical meeting for the year had a theme of 'Up and Over or Down and Under' which addressed the benefits and techniques of the different approaches to level crossing elimination.

#### **4. Seminars**

In addition to the Technical Meetings, one-day seminars were held as follows:

'Australasian Train Detection Seminar – Principles & Practice', in Adelaide on 7 April.

'Australian Level Crossing Protection Principles and Practice', in Perth on 14 July.

#### **5. Annual General Meeting**

Tony Howker's report of the Annual General Meeting on 8 April 2016, together with an account of the Adelaide Technical Meeting, were published in issue 224 of IRSE NEWS (pp.22 – 24).

The AGM was chaired, in the absence of the Chairman Mr Peter McGregor, by the Vice Chairman, Mr G Miller.

The Awards for 2016 were made as follows:

Byles & Calcutt, no award given.

Semaphore, no award given.

Shining Light Award, to Zdenka Wright.

Chairman's Award, to Trevor Moore.

## **Australasian Section report - 2016**

The following officers and committee members were elected:

Officers:

Chairman	Mr. G .Miller (F)
Vice Chairman	Mr. K Sundareswaran (F)
Secretary	Mr. L F Brearley (HF)
Treasurer	Mr. G. Willmott (HF)

New Committee Members:

Mr S Lemon (M)  
Mr I Roulstone (M)  
Mr G Josh (M)  
Mr N Hughes (AM)

Retiring Committee Re-Elected

Mr. H B. Luber (M)  
Ms. C K Gash (M)  
Mr. T G Moore (F)  
Mr A Maharaj (M)

Committee Remaining in Office (elected March 2015)

Mr. P Huth (AM)  
Mr. K Karrasch (M)  
Mr. A Neilson (F)  
Mr. J Skilton (F)  
Mr S Cotton (F)  
Mr P Burns (M)  
Ms Y Griggs (M)  
Mr. G Cumming was elected by Committee as Auditor.

Ms Y Griggs resigned from the committee mid year and was replaced by Mr W Milburn.

The Chairman thanked retiring committee members:

Mr. A C Howker (HF)  
Mrs R Taylor (A)  
Mr M Jain, (M),  
for their service to the Section and the committee.

In the chairman's absence, the Badge of Office was handed over to the incoming chairman by the IRSE Senior Vice President Mr C Page.

Details of this meeting are recorded in the minutes of the AGM 2016.

The following organisations are thanked for their assistance in providing sponsorship for events, trade displays and advertisements at the Technical Meetings during the year:

A&K Ross Associates  
Alpha Power Systems  
ALSTOM  
Ansaldo STS

## **Australasian Section report - 2016**

Arcadis  
Australasian Centre for Rail Innovation  
Australian Rail Track Corporation  
Aurecon  
Australian Transport Safety Bureau  
Boleh Consulting  
Bombardier  
B&R Enclosures  
Competency Australia  
Grade Separation Authority  
Cyient  
DAD – Systems Information  
Modelling  
DCI Electrical Services  
DEHN  
Ethernet Australia  
Frauscher Sensor Technology  
Geomatic Technologies  
Interface Rail engineering  
IPD  
JMDR  
Lockheed Martin  
Magnetic Automation  
MGB International  
Motzky  
MTM  
Opus Rail  
Optical Systems Design  
Parsons Brinkerhoff  
Peter Burns Consulting  
Phoenix Contact  
PTV  
Q-Sheet Metal  
Rail Operations Consulting  
Rail Personnel Contracting  
RISSB  
Rio Tinto Iron Ore  
Siemens  
SelectRail  
TUV Rheinland  
TTG Transportation Technology  
UGL  
Wabtec Control Systems  
West Australian Power Protection

## **Australasian Section report - 2016**

### **6. Local Technical Meetings were held in Australian states in 2016 as follows:**

#### Queensland

On 22 March 2016, attendance 34:

Technologies leading and shaping complex systems and the adaptation and integration of ETCS and PTC to deliver new hybrid systems for heavy-haul freight railways – Vijay Kumar (Ansaldo STS).

Concepts and processes for the successful integration of complex systems on heavy-haul freight railways – Dinesh Kumar (Ansaldo STS).

On 17 May 2016, attendance 32:

Railway telecommunications more important than ever before – a history of railway telecoms and the ever-growing presence – Jacek Mocki (MOTZKY).

Essential Examples - examples of installed systems in several countries and applications. – Nick Czeperko (Ethernet Australia).

24 August 2016, attendance 31:

Train Control Systems Standards – Russ Evans (RISSB).

Save Time and Reduce Costs – A four point solution – Jacek Mocki (MOTZKY) and Rick Draper (Amtac Professional Services).

8 November 2016, attendance 55:

Resignalling of Denmark - Morten Søndergaard (WSP Parsons Brinckerhoff).

7 December 2016, joint meeting with RTSA, PWI and RTTA, attendance 70:

Operations & Network – a delicate balance – Therese Miller (QR)

#### South Australia

1 September, joint meeting IRSE, RTSA & PWI, attendance 65:

Collision involving road-train truck and train 8834N near Narromine, New South Wales, 23 September 2015 – George Erdos (Australian Transport Safety Bureau)

Level Crossings – When is enough, enough? – Simeon Cox (DPTI)

#### Victoria

17 February 2016:

Interfacing interlockings with ETCS Level 2 – Karthik Palanisamy and Koby Yu (ALSTOM).

Lightning & Surge Protection for Signalling Applications – Hans Slacter (DEHN).

16 March 2016:

CBTC – Giuseppe Palma (Bombardier).

Travel to Work - Have we forgotten the passenger? – Peter Burns (PYB Consulting).

20 April 2016 - IRSE/RTSA combined meeting:

## **Australasian Section report - 2016**

Signalling Arrangement Plans – Garbage In, Garbage Out – Richard Stephens (WabTec).

Explosion modelling in railway environments – Cristian Biotto (Aurecon).

11 May 2016:

Movement Authority - A Systems Framework – Peter Burns (PYB Consulting).

50 Years of Signalling – Tony Howker (Retired IRSE).

17 June 2016:

Big Data and Remote Diagnostics – Chris Whiteside (Siemens).

North, McKinnon & Centre: Grade separations to go – Rimmy Chahal (John Holland).

20 July 2016:

Accreditation of signalling projects –Andrew Doery (ONRSR).

History of telecommunications – Jacek Mocki (Motzky).

17 August 2016:

Overview of Signalling at Diamond Valley Railway – Bruce McCurry (Diamond Valley Railway).

Remote Overhead De-energisation and Earthing System for MURL –Wesley Allen & James Donovan (MTM).

21 September 2016:

Remote Condition Monitoring of Surge Arrestors in Signalling Networks – Glen Turvey and Hans Slagter (IPD)

Telecommunication – Essential Examples – Nick Czeperko (Ethernet Australia)

19 October 2016:

Management of Mud Holes – Nathan Lorient (MTM).

Wheel Rail Interface – Shane Cooper (V/Line).

### New South Wales

25 February 2016, attendance 63:

Auckland ETCS Level 1 – Phil Baker (Siemens).

23 March 2016, attendance 49:

Sydney Trains Signal Design for TfNSW Environment – Stephen Lemon (Sydney Trains).

5 May 2016, attendance 48:

Tokyo Visit – ITC Seminar Level Crossings and Observations of Signalling System Architecture and Rail Traffic Management between UK, Japan, US and Europe – Peter Symons (Tritun).

June 2016 Combined IRSE and PWI (Permanent Way Institute NSW), attendance 120:

PWI Presentation – The Evolution of Parramatta Light Rail from Strategy to Procurement – Graeme Steverson (WSP /Parsons Brinckerhoff).

## **Australasian Section report - 2016**

IRSE Presentation – Catenary-Free Light Rail for Innovative and Environmentally Friendly Mobility – Marc Hamameh (Siemens Mobility).

2 August 2016, attendance 40:

What they didn't tell you at University, or did they? – John Aitken (Aitken & Partners).

22 September 2016, attendance 52:

Observations on Perth Technical Meeting and site visits July 2016 – Jung Mok (AECOM).

Improving railway performance with advanced technologies – Bill Palazzi (Palazzirail).

20 October 2016, attendance 48:

Train Braking and Signal Design to Prevent SPADs – Trevor Moore (ARTC).

24 November 2016, attendance 58:

Signalling the Future and You – Peter Symons (Tritun).

### Western Australia

15 March 2016 - Joint meeting of IRSE and RTSA, attendance 38:

Design & Construction of the Perth Stadium Rail Project – Mike Broderick (PTA) and Simon Turner (AECOM).

9 December 2016, attendance 30:

Christmas Networking and Social Event.

### New Zealand

March 2016, attendance 30:

Rail Innovation.

June 2016, attendance 40:

Signals 101.

October 2016, attendance 30:

Signals 101 (repeated owing to popularity).

October 2016, attendance 12:

Rimutaka Tunnel Communications Upgrade.

November 2016, attendance 70:

Level Crossing Forum.

## **7. Membership**

The number of IRSE members resident in Australasia was 743 as of 31 December 2016. The number of members of the Australasian Section was 594.

## **8. Additional Significant Activities for 2016**

The last students to complete the Graduate Diploma through Central Queensland University did so in February 2016. Considerable work was carried out on finding an

## **Australasian Section report - 2016**

alternative university provider, unsuccessfully due to the relatively small student numbers. Attention then focused on developing a training package for delivery of the Graduate Diploma in the VET sector.

'Insight in Railway Signalling' courses were held at Melbourne and Sydney.

IRSE input into the CORE conference.

IRSE input into AusRail.

IRSE input into the Australasian Railway Industry Awards event and the 'Systems Engineering' award.

### **9. Officers**

#### **Australasian section – Officers:**

Chairperson: Glenn Miller

Vice-Chairperson: Kayinur Sundaeswaran

Secretary: Les Brearley

Treasurer: Geoff Willmott

Country Vice-President: Robert Baird

#### **Committee Members:**

##### Queensland

Mr Ken Karrasch

Mr Mark Fynmore

Mr Garry Josh

##### New South Wales

Mr Trevor G. Moore

Mr Steve Lemon

Mr Andrew Gardner

Ms Georgina Hartwell

##### Victoria

Ms Cassandra Gash

Mr Brian Luber

Mr Peter Burns

Mr Ian Roulstone

##### South Australia

Mr Mayank Jain

##### Western Australia

Mr Arvind Marahaj

Mr Nick Hughes

##### New Zealand

Mr Allan E. Neilson, FIRSE

Mr John Skilton, FIRSE

##### Past Chairman

Mr Peter McGregor

## **Australasian Section report - 2016**

### Council Members

Mr Peter Symons

Mr Charles Page

Mr Steve W. Boshier

## **Southern Africa Section report - 2016**

### **1. Introduction**

During the period between the IRSE UK AGM in April 2016 and the AGM in 2017, the activity of the South African signalling industry focused on the following:

Renewal of the commuter rail network signalling installations in the Gauteng, Durban and Cape Town metropolitan areas.

Signalling expansions or implementing signalling changes to various selected freight rail corridors to increase the capacity of the general freight network.

Essential train control system developments, enhancements, maintenance and repair to ensure continued train operations on existing commuter and freight rail networks.

Ensuring sufficient resource competency and capacity in the local industry to meet the needs of these initiatives remains a big challenge to the industry and the IRSE Local Section.

Broad-based interest in the proceedings and offerings of the IRSE is showing some signs of increasing. The willingness of the local industry to financially support the IRSE's Southern Africa Section remains mixed, with good support from some industry players and limited or no support from others.

### **2. Main Activities during the 12 months to April 2017**

Third 2016 Technical Meeting (12 May). The topic was 'Level Crossings and Level Crossing Protection'.

Fourth 2016 meeting, as per programme, had to be cancelled due to unforeseen circumstance arising at short notice that rendered the presenter unable to present and no replacement could be found.

Fifth 2016 Technical Meeting (14 July). The topic was 'Regional Development and Integration: SADC with a Silver Lining – a Transnet Approach'.

Sixth 2016 Technical Meeting (11 August). The IRSE President for 2016 - 2017 visited South Africa at the time of this meeting. The President initially spoke on the topic 'Moving Forward'. This fundamentally focused on the strategic direction in which the IRSE is striving to go and how this will be achieved. This information was well received. Based on a specific earlier request, the President also delivered a truly enlightening description of the Australian train control system industry history, structure and the current status. Getting this information hands on, being able to compare it to the South African industry and being able to briefly discuss the similarities and differences was very beneficial.

Seventh Technical Meeting (08 September). The topic was 'Testing an Electronic Interlocking' and was presented by one of our emerging young signalling engineers, Nikesh Hargoon.

Annual Technical Visit for 2016 (10 September). The visit was to the Siemens factory where the new Sicas S7 processor-based interlockings for the Gauteng Resignalling are

## **Southern Africa Section report - 2016**

being built and tested. The visit augmented the ninth Technical Meeting held on 08 October 2016.

Eighth Technical Meeting (13 October). The topic was 'Fibre Bragg Grating in Railway Applications', presented by Juan Bruyns of Actom (Pty) Ltd.

Annual General Meeting and ninth Technical Meeting (10 November). The topic was 'The Monorail Dream in South Africa: The Alternative', presented by Mashia Tebele of Bombardier SA.

The first Technical Meeting of 2017 was held on 09 March. The topic was 'Technology Mapping for Signalling, Train Control & Communication Systems from a Perspective of a Railway Asset Owner', presented by Portia Xaba of the Gautrain Management Agency. This paper was published in issue 235 of IRSE NEWS (pp.2 – 10).

The Southern Africa Section continues to have the privilege of using the video conferencing system of GIBB to connect Technical Meeting venues in Johannesburg, Durban and Cape Town. This has enabled a wider participation in these events and is most certainly appreciated.

The level of attendance at the technical meetings listed above has varied significantly but, on average, has stayed much the same throughout the year. We continue to face the challenge that there are usually more guests than members attending these meetings.

Efforts to increase the number of members have had some positive outcome, but there is still opportunity and further effort needed to meaningfully change the relatively low level of membership. The initiative to get recognition as a Voluntary Association from the Engineering Council of South Africa (ECSA) has been revived with a resubmission, various meetings held with ECSA and the opportunity to engage directly with the CEO.

### **3. Plans for the next 12 Months**

The current 2017 focus areas for the Southern Africa section are captured below.

These will however be reviewed and refined after the AGM in November 2017, when the newly elected committee is in place. Accordingly, these focus areas and plans may change.

The process of getting formal recognition from the Engineering Council of South Africa of the IRSE Southern Africa Section as a Voluntary Association is still not concluded for various reasons, mainly outside of the control of the local section. A concerted effort to achieve this within 2017 is now under way, with indications of the best possibility of being successful being seen. Implementing the potential advantages when achieved will need to follow in 2017 and into 2018.

Identifying alternative approaches and enhancing ongoing efforts to encourage our guests and others in the train control systems arena to become IRSE members. Some progress has been made in this regard during 2017.

Completing the current 2017 programme of events as planned. There are two further Technical Meetings set in October and November and the November Technical Meeting will also serve as the Annual General Meeting for the Southern Africa Section.

## **Southern Africa Section report - 2016**

Consideration is still being given to organising a Technical Visit in either October or November, but these arrangements are still to be finalised provided a suitable opportunity for the visit can be secured.

Election of a new IRSE Southern African Section Committee at the November AGM.

Formulating a programme of events for the Southern Africa Section for our 2017 -2018 year that will encourage further interest and participation in the Local IRSE Section.

Further efforts and alternative ways to approach the captains of the railway and signalling industry in South Africa to promote the IRSE and to promote a better understand of how the IRSE can contribute to the success of the industry.

Contributing to ensuring sufficient resource competency and capacity in the local industry to meet the needs of these initiatives remains a big challenge to the industry and the IRSE Local Section.

Broad-based interest in the proceedings and offerings of the IRSE is showing some signs of increasing. The willingness of the local industry to financially support the Section remains mixed, with good support from some industry players and limited or no support from others.

### **4. Southern Africa section – Officers:**

Chairperson: Kobus van Niekerk.

Vice-Chairperson: Portia Xaba.

Secretary: Ryan Gould.

Treasurer: Johan van de Pol.

Country Vice-President: Graham Paverd.

Committee Member (Membership and Recruitment): Harry Ostrofsky.

Committee Member (Programme Director): Kamy Pathar.

Committee Member (Meeting Co-ordinator): Piet van Nieuwenhuizen.

Committee Member: Dirk Kruger.

## **Thailand Section report - 2016**

### **1. Introduction**

The IRSE Thailand Section was inaugurated in July 2016, so there is as yet no information to report in relation to Annual General Meetings.

At this time there are 40 members in the Section.

### **2. Main Activities during the past 12 months**

Approval of IRSE Thailand Section

Key to the Thailand section being formed was obtaining the required signatories from in-country members for submission to the IRSE in order that approval could be given to form the Section.

Inauguration Ceremony

On 27<sup>th</sup> July 2016 the Thailand section held its Inauguration Ceremony at the Faculty of Engineering at Kasetsart University. The event was attended by IRSE President Mr Charles Page and several prominent figures within the local rail industry.

A report of this ceremony was published in issue 225 of IRSE NEWS (p.21).

Committee Meetings

Several committee meeting have occurred during the course of the last year including meetings dedicated to the planning of the Inauguration Ceremony.

Setting of Objectives

The Section has identified and implemented the key objectives which will form the basis of the Section's aims. In total, six objectives were identified and agreed by the committee.

### **3. Plans for the next 12 months**

Committee Meetings

Continue with regular committee meetings to ensure the aims and objectives of the Section are on track. One of the key areas will be the attraction of more members to grow the Section.

Evaluation of Committee Members

Undertake a review of the current committee members and assess if we need to change in order to bring in some further diversification.

Technical Meetings

Implement a series of technically focused meetings, to be held ideally every three to six months. Initial dates have been identified and will be formalised.

Younger Member Focus

Assess and identify how we can get younger members involved in the section and look at development opportunities, such as presenting papers to aid public speaking.

## **Thailand Section report - 2016**

### **4. Thailand section – Officers:**

Chairman: Prof. Wichai Siwakosit

Secretary: Arnut Srisakuldee

Treasurer: Vasuwee Euanchita

Webmaster: Arnut Srisakuldee

## **Ireland Section report - 2016**

### **1. Introduction**

The Annual General Meeting of the IRSE Irish Section was held on 15th February 2016 in Belfast and reported a healthy year with rising membership and excellent participation in all events. The committee was increased from six to eight members to ensure wide representation and to assist with an increasing workload.

There are at present approximately 85 members in the Section.

### **2. Main Activities during the past 12 months**

Luas light rail extension, Dublin (technical papers and visit)

On Thursday 14th April 2016, Transport Infrastructure Ireland (TII) hosted a technical visit to the Luas Cross City (LCC) light rail extension, now under construction in Dublin. The visit was attended by 25 members of the Irish section of the IRSE, with a good mix of engineers from north and south of the country.

The meeting commenced in the TII building in Parkgate Street with two technical presentations. The first was given by TII's System Engineer, Peter Bennett, on LCC construction works, with particular reference to the interfaces between the Systems and Main Infrastructure contracts. The second was given by TII's Power & System Manager, Bernard Kernan, on various signalling issues that had arisen during the design of LCC, particularly issues that would never be encountered on a heavy rail system. Each presentation was followed by a lively question and answer session.

Following the presentations, the group travelled by tram to the city centre and spent a number of hours inspecting the many worksites that are open in the city. The site visit was facilitated by the Main Infrastructure contractor, SSJV, whose site engineers explained the many practical difficulties that have to be overcome to build a railway system through a busy city centre. The members were particularly interested in seeing the progress of works from initial ground-breaking to final track finish, as they moved from site to site. It is anticipated that further visits to the works will be arranged accordingly as the project moves from construction into testing and commissioning and ultimately to passenger service over the next eighteen months.

Ardnacrusha power station and Shannon air traffic control centre (technical and social weekend)

The Section's weekend Technical Visit took place on Sunday 19th and Monday 20th June. Inclement weather did not allow for the planned walking tour of Limerick City, however attendees enjoyed a tour of the impressive fortress that is King John's Castle with its interactive interpretive displays. That evening members and guests were treated to a tour of the eclectic collection of art and historical artefacts of the Hunt collection housed in the early Georgian former Custom House. Joe Coleman delivered a slide presentation and amusing talk on the railway line to Ardnacrusha power station, based on a chapter of his forthcoming book, and this was followed by a barbeque with attendees ending their evening enjoying traditional music in a nearby inn.

## **Ireland Section report - 2016**

On Monday members, guests and partners were taken by bus to Ardnacrusha where Dermot Finnan of the ESB took them on a tour of the hydro-electric power station. The hydroelectric generating station has been producing electricity since its commissioning in 1929. Located just outside Limerick City it was one of the largest engineering projects in the world at the time it was built. The successful completion of the scheme proved that the then new Free State could independently, successfully realise one of the major engineering undertakings of the day while the execution of the scheme was the one single event that marked the reappearance of the firm of Siemens-Bauunion on the world electric scene following the gloom from the first World War and its aftermath. For those attending the sheer scale of the project for the times evoked a sense of awe while the problems imposed by the scheme in the management of fish stocks on the river and its solution aroused interest, however, the original control room, still in its original condition, proved truly fascinating.

Following lunch, guests and partners were dropped at Bunratty Castle where they well enjoyed a tour of the castle and folk park while members took the short trip to Shannon Airport where a technical visit to the Irish Aviation Authority (IAA) Air Traffic Centre (ATC) took place. Irish controlled airspace acts as a gateway between Europe and North America, with the IAA's Shannon Centre handling over 90% of all air traffic on the north Atlantic route; this equates to approximately 1,500 aircraft every 24 hours during the busy summer months. Declan Mangan, Operations Manager of the Irish Aviation Authority gave members a very interesting insight into the fundamentals and intricacies of air traffic control including the unique position the Shannon centre played as a transition from the strict height and heading regime of uncontrolled oceanic airspace to the highly regulated European air corridors. The part played by Shannon controllers in regulating flights so as to reduce stacking over Heathrow and its contribution to reduced fuel consumption, pollution and emissions targets was of particular interest.

IAA engineer, Tony Donnelan gave a presentation on the systems and equipment used for the detection of, and communication with, aircraft together with the configuration of the control centre. The visit concluded with a look at the control floor and a visit to the equipment rooms where the video wall in the technical support office that included displays from all of the diagnostic systems was of particular interest. Some interesting methods used to announce and remember faults and system alarms were noted and became the subject of discussion and, it was observed that the topic would possibly justify a paper of its own. The opportunity to talk with the technical support staff was very welcome and the generosity of the IAA in accommodating the visit, especially considering current security concerns, was much appreciated.

GSM-R technology for safety critical voice and data communications (technical papers).

On Thursday September 15<sup>th</sup>, in association with Engineers Ireland Railways Group, a presentation entitled 'GSM-R, using mobile phone technology for safety critical voice and data communications' was held at Engineers Ireland premises at Clyde Road Dublin. Henri Gautier, of Kapsch, Irish Rail's GSM-R contractor, delivered a

## **Ireland Section report - 2016**

comprehensive paper that detailed the background, functional operation, architecture, current status and future evolution of GSM-R while Aldo Paolozzi, New Works Manager, Telecomms, of Irish Rail described the company's current GSM-R project. Aldo provided the audience with interesting details of the challenges posed, including System interfaces, integration with existing systems, migration from analogue, operational changes, coverage, safety approvals and getting agreement with the National Communications Regulator on frequency allocation. The papers thoroughly described the problems posed by the adopting rapidly evolving technology in a high inertia, high reliability and high proof-of-safety environment and were very well received by those present.

Planes, Trains and Human Factors in Transport Safety (technical paper)

Following the Section's Annual general Meeting on 1st March 2017, a Technical Meeting was held at the Northern Ireland Railways signalling department offices in Belfast. John Barnett, a Human Factors consultant combined his lifelong interest in aircraft and professional involvement in rail safety to deliver a paper looking at both the theory of accidents and the concept of human factors, as well as the humans' part in contributing to, but in many cases avoiding, those accidents.

An article based on this paper was published in issue 237 of IRSE NEWS (pp.2 – 8).

The Annual Dinner Dance was held in the Hilton Hotel, Belfast on November 18th.

### **3. Plans for the next year**

The programme for 2017 – 2018 includes a paper on Railway Regulation by Gerald Beesley, the outgoing Irish Commissioner for Rail Regulation, a June technical weekend visit to the Londonderry - Portrush resignalling project, a September paper on 'Smart Cities' in conjunction with Dublin City Council and the annual dinner dance in November in Cork.

### **4. Irish Section - Officers**

Chairman: Sean Burns

Vice-Chairman: Peter Cuffe

Secretary: Colin McVea

Treasurer: Huw Bates

Events Manager: Michael Murphy

## **French Section report - 2016**

### **1. Introduction**

The French Section is now over a year old but no Annual General meeting has yet taken place.

The Section has decided to organise free events (around four per year, including conferences and technical visits) each individually sponsored by companies who have members.

The Section has been increasing its number of members from 45 (minimum for the creation of the section) to 75 members of the IRSE today. We have also attracted the interest of about 190 other people, potentially future members of the IRSE.

Minutes of all meetings are written and available in French.

### **2. Main Activities during the past 12 months**

#### **Committee Meetings**

The French Section has held nine regular Committee meetings since April 2016. The committee meetings are well attended with physical or online presence of our seven committee members, namely Christian Sevestre (Consultant, ex-SNCF), Jacques Poré (Alstom), Hugh Rochford (SNCF Réseau), Jocelyn Gallou (SNCF Réseau), Philippe Lebouar (SNCF Réseau), Gilles Pascual (Ansaldo) and Pierre Damien Jourdain (Alstom).

The agenda consists of decisions to be taken regarding the Section's development (visiting major railway companies for IRSE promotion) and preparation of events (contacts and coordination of the events).

#### **Events and Technical Conferences**

These events attracted around 70 individuals at each conference (limitation of 50 for the technical visit), amongst which were both members and non-members.

The conferences focused on signalling presentations on topics of national and international interest, including:

- 15th June 2016: Conference on ERTMS - feedback of experience of French companies in France and abroad.
- 1st August 2016: Technical visit to the French wide range control centre (CCR) in St Denis.
- 20th March 2017: Conference on the 'Internet of Things' in the railway environment.

All Conferences this year were hosted by SNCF Réseau and the technical visit by SNCF Réseau and SETEC. Events end usually with informal networking and refreshments.

The interest and satisfaction of attendees is good and the number of attendees is increasing.

After each event, we plan to send an article to IRSE NEWS to increase visibility.

## **French Section report - 2016**

### **3. Plans for the next 12 months**

Plans for the future mainly concern the events we will organise. The IRSE French Section will organise new events towards the beginning of year 2018:

- A technical conference on the feedback of experience on high speed lines (SEA , BPL) with a PPP organisation,
- A conference on the feedback of experience on a conventional line (CNM) with a PPP organisation, including the French certification body's views.
- Conference on formal methods.
- Conference on BIM (Building Information Modelling) tools.
- Conference on driverless RER.
- Possible technical visit to the Lille Metro.

Feedback of this first year is being analysed but we already see the fruit of our efforts to promote contacts and discussion across the French sector. This action has never before been done in France and is felt to be beneficial.

### **4. French Section - Officers**

Chairman: M. Christian Sevestre

Country Vice-President: M. Jacques Poré

Secretary: M. Hugh Rochford

Webmaster: M. Hugh Rochford

## **Singapore Section report - 2016**

### **1. Introduction**

During 2016 we have held presentation meetings at approximately bi-monthly intervals, typically attended by around 70 people. The Section has also made a start preparing for the ASPECT 2017 Conference.

### **2. Main Activities during the past 12 months**

During the 2016 to 2017 year the Section organised the following presentations:

- 25th July 2016 - 'Moving forward' presented by IRSE President, Charles Page (Siemens Australia).
- 19th September 2016 – 'Faults and Failures in Railway Signalling Systems' presented by M. P. White (LTA Singapore). This was attended by 74 people, including members of the IRSE Malaysian Section and was the highest number of attendees to date for one of our presentations.
- 5<sup>th</sup> November 2016 - Annual General Meeting.
- 18th November 2016 – 'Singapore Down Town Line Signalling' presented by Joanna Lee (Siemens Singapore).
- 7th March 2017 – 'Upgrading the World's Oldest Underground Railway - A Signal Engineer's view' presented by Mike Harvie (Transport for London).

Presentations are open to both IRSE Members and non-Members. There are currently approximately 45 Members in the Section.

In addition to the above presentations, the committee had a visit to the SBS Down Town Line's Gali Batu Depot on 18th March 2017. This visit included viewing the Operations Control Centre for the Down Town Line, the Signalling Equipment Room. and the train maintenance facility.

Three members of the Singapore Section's committee attended the IRSE's International Convention in Beijing in October 2016: L Y Lam, Toh Kim Toon and M. P. White.

### **3. Plans for the next 12 Months**

The Section will continue to hold presentations at approximately bi-monthly intervals over the 2017 to 2018 year, planned as follows:

- 23 May 2017 – 'Managing and implementing practical Information Technology Systems and Information Technology Security in Railway Communications systems', presented by Mr Lim Thiam Siew (SBS).
- 11 July 2017 – 'Guide to the Production of Scheme Plans and Equipment Layout and Routing Design Drawings (ELARDS) for Green Field Projects, presented by Mr Kang Poh Peng (Thales).
- 14th November 2017 – 'Condition Monitoring of Track – to be presented by Andrew Ng (Singapore Institute of Technology).
- 27th February 2018 – 'Clapham Junction Railway Accident - Lessons Learnt', to be presented by M. P. White (LTA Singapore).

## **Singapore Section report - 2016**

- The ASPECT 2017 Conference and Singaporean and Australasian IRSE Sections Seminar will take place in Singapore from 27th November to 1st December. Members of the Singapore organising committee are Robert Cooke, Martin White, Toh Kim Toon and Andrew Keong Ng. Regular video conferences have been held with the main organising committee based in the UK and the Australasian organising committee in Australia and New Zealand.

### **4. Singapore Section - Officers**

Chairman: Robert Cooke

Country Vice-President: Mark Appleyard

Secretary: Martin White

Treasurer: Ian Tomlins

Webmaster: Lim Chiau Koon

## **Malaysia Section report - 2016**

### **1. Introduction**

The Section held its Annual General Meeting on 30th December 2016, at which time draft management accounts were presented, pending completion of audit. The number of Members in the Section (as at October 2016) was confirmed to be 147.

### **2. Main Activities during the past 12 months**

- The Malaysian Section celebrated its third anniversary on 27th October 2016.
- A site visit was organised to the Klang Valley Mass Rapid Transit Line 1 Depot at Sungei Buloh.
- Members of the Section participated in the Singapore Section's Technical Presentation 'Faults and Failures in Railway Signalling Systems' on 19th September 2016.
- Study Groups held in preparation for the IRSE's 2016 Examinations.

A brief report on some of the activities of the Malaysian Section appeared in the issue 228 of IRSE NEWS in December 2016.

### **3. Plans for the next 12 months**

In April 2017 presentations were planned on 'High Speed Rail Systems', 'The Hyperloop System' and 'Inauguration of Women in the Malaysian Section'.

The IRSE Malaysian Section Annual Seminar will be held in September 2017.

At the end of November 2017 members of the Section will participate in presentations at the IRSE's ASPECT Conference in Singapore.

### **4. Malaysia Section – Officers**

Chairman: Dato' Mohd Salleh Abdullah

Secretary: Aniket Mukhopadhyay

Treasurer: Hazwan Alif Abdul Rahman

Webmaster: Aniket Mukhopadhyay

## **Netherlands Section report - 2016**

### **1. Introduction**

The Netherlands Section held its Annual general Meeting for the year 2016 – 2017 on 19<sup>th</sup> May 2016. Four new officers were elected and the annual accounts were presented. The numbers of IRSE Members in the Section at that time was approximately 220.

### **2. Main Activities during the past 12 months**

The main activities of the Netherlands Section during the 2016 – 2017 year, including both events for members to attend and actions for the Board (Section Committee) were as follows:

#### **Activities for Members**

- 24<sup>th</sup> February 2016 - a presentation 'Dispatching System ProRail; Past, Present and Future' was attended by 61 members.
- 19<sup>th</sup> May 2016 - a presentation on 'Roll-Out of ERTMS in Denmark' was given, attended by 82 members.
- 29<sup>th</sup> September 2016 - a presentation on 'Rail Crossings with CWT based on ETCS Level 2 baseline 3 principles' was given, attended by 49 members.
- 10<sup>th</sup> January 2017 - presentation of the OGSM (Objectives, Goals, Strategies and Measures) strategy results. 62 members attended.

#### **Significant changes; New Board (Committee)**

Important during this year were the changes in the Board in 2016, as four of the ten Board members had reached the end of their electoral period. The Board sent out a request to the Dutch members for nominations for Board positions and the Board was elected at the Annual General Meeting in May 2016.

The Section Chairman, Peter Musters, was one of those members at the end of his electoral period, so the Board elected the former Secretary Alwin van Meeteren as Chairman, with Ben van Schijndel being elected to the post of Secretary.

Details of all the Section's Officers are given in section 4. of this Report.

#### **New Strategy process for 2017 onwards**

During several board meetings and evenings spent together, the new Board developed a renewed strategy for the next ten years. In the first formal board meeting it was decided to use the so-called 'OGSM' - Objectives, Goals, Strategies and Measures method to develop the new strategy.

#### **Mission**

To improve the safety and the increase of the capacity of rail-guided systems by the retention and further development of the knowledge and practice of signalling.

## Netherlands Section report - 2016

### Vision

By developing and bringing together professionals and knowledge in the field of signalling, we propose and encourage them to realize solutions for the optimization of the use of track.

Goals and Strategies are defined in five major strategy items as follows:

Strategy Item	Goal	Achievement
Knowledge Platform	Securing, deepening and broadening of knowledge by bringing together knowledge and collaborations with knowledge sources (e.g. universities).	Number of times developed knowledge is consulted (measurement: hits on website irse.org).
Network	Developing knowledge and acquaintances by increasing and simplifying access to knowledge and acquaintances.	Percentage of members connected to percentage of members through online networks (measurement: LinkedIn).
Concerned Members	Increasing the involvement of its members by mobilizing the knowledge of its members.	Percentage of the members present at least one event (measurement: own records).
Opinion Shaper	The interpretation of developments in the industry so that it can be practically applied.	Number of times you are cited by others (measurement: Internet service).
Image	Securing the continuity of knowledge of signalling by a relevant and contemporary knowledge platform	Percentage of members who believe that the IRSE has a modern image (measurement: annual membership survey).

Each of these five strategy items was then assigned to a non-executive Board member to progress. Each item owner has two assistants (also Board members) to help further development.

### Other issues during 2016

We were also happy to be invited by the Dutch House of Representatives (Tweede Kamer) during a hearing for the roll-out of ERTMS in the Netherlands. We have supplied a letter with a statement of support from IRSE Netherlands Section and its members to assist in this roll-out.

Special attention was given to young (potential) members. A special program was executed with the goal of being more interesting to younger members

Besides excursions and presentations, we have updated our website with technical information and the presentations that were held.

## **Netherlands Section report - 2016**

### **3. Plans for the next 12 months**

ERTMS is going to remain an important topic in the Netherlands, since roll-out on a nationwide scale is foreseen to start in 2017. There will be two IRSE meetings regarding this topic and the two large re-signalling projects in the Netherlands, namely Metro Rotterdam and Metro Amsterdam. It is going to be an interesting year for all members of the IRSE Netherlands Section.

For the rest of coming year the program will be based on issues as they arise, the intention being that site visits alternate with technical meetings and presentations. A visits was planned for March (Control Centre in Utrecht), technical meetings in April and/or May, a further technical visit in September and a technical meetings/ presentations in November and/or December.

Subjects which are being further developed (besides ERTMS and Rotterdam and Amsterdam Metros) include:

The future through the eyes of Rail Alert (Safety).

Visit to the Port of Amsterdam or Rotterdam, driverless truck systems.

EULynx European initiative Linking Interlocking Systems.

Closing ATB gaps ('islands') such as Kijfhoek and Arnhem.

EMC, its growing influence and what to do.

Internationalization in the rail market

Furthermore, there is a plan for a presentation by Tom Jansen who received a bursary to attend the Convention in 2016. This will contribute to retaining the main focus in the coming years on the recruiting of young(er) members. We need to grow in this field in order to have a solid future and safeguard our added value.

### **4. Netherlands Section – Officers**

Chairman: Alwin van Meeteren

Country Vice-President: Fred Dissel

Secretary: Ben van Schijndel

Treasurer: Tom Spronk

Webmaster: Wim Coenraad (temporary)

## **North America Section report - 2016**

### **1. Introduction**

The North America Section had a banner year for meetings and attendance. The Annual General Meeting for 2016 was held on 28<sup>th</sup> June and, with over 60 people in attendance, this was the Section's largest-ever AGM event. It was recorded at this point that there were 54 IRSE members in the North America Section.

### **2. Main Activities during the past 12 months**

The Section's first activity was the Annual General Meeting held in conjunction with the Railway Systems Suppliers Inc annual Exhibition on Tuesday, June 28th 2016 at 4 pm in the Dallas 1 Room at the Gaylord Texas Convention Center in Grapevine, Texas. The meeting's Agenda was as follows:

- a) Introduction of Attendees;
- b) Safety Moment;
- c) Presentations;
  - a. BNSF – Non-Traditional Slide Fence Research and Results;
- d) Dave Thurston - Standards and their Organizations'
- e) Introduction to IRSE – W.J. Scheerer;
- f) Impact on the Rail Industry;
- g) Patrick Sullivan - Highway-rail grade crossing warning system activating failures;
- h) IRSE North America Convention 2017;
- i) Other matters;

The normal business meeting concluded the day's activities with the Section members present.

Our second activity was conducted on December 1st and 2nd at the Royal York Hotel in Toronto, Canada. This was the Council-supported Conference on Communications Based Train Control, and was the first fee-based conference held by the North America Section. By all measures, it was a great success with over 115 attendees and a total of fourteen speakers presenting topics that ranged from Cyber Security to the history of CBTC. There were several discussions of continuing the event next year to coincide with the opening of the Toronto Transit Commission line extension that will be 'CBTC-only'.

The program was as follows:

#### **Thursday December 1**

- 7:30 Registration and Continental Breakfast.
- 9:00 Introduction by Yousef Kimiagar: Chairman Organizing Committee.
- 9:05 Welcome from Charles Page: President IRSE.
- 9:15 Keynote Address from Mike Palmer: Chief Operating Officer, Toronto Transit Commission.
- 9:30 'The Evolution of CBTC' by Jane Ng: Vice President, Marketing and Strategy, Thales Urban Rail Signalling.

## North America Section report - 2016

- 10:00 'CBTC in Heavy Passenger Rail Applications – a Challenge to the Industry' by Adrian A. Peach P.Eng. CEng CSEP MIET MIRSE, Hatch.
- 10:30 Coffee Break.
- 11:00 'Re-Signalling with Communication Based Train Control Signalling Systems' by Shantilal Morar: Project Design Authority – UK Projects, Thales Canada Transport Solutions.
- 11:30 'Determining the need for Secondary Train Control for a CBTC System - BART Train Control Modernization Program' by Jonathan Hulse P.Eng, Engineering Director, Parsons.
- 12:00 Lunch topic 'Are you a Visionary or a Skeptic?' by Dr. Alan Rumsey, RTS Consulting.
- 13:00 'NYCT Multi-Supplier Interoperability Program' by Gregoire Sulmont Vice President Systems Sector Manager, Systra.
- 13:30 'Research on Signal System Interoperability of Urban Rail Transit' by Xiaoguang Sun, CRSC Research and Design Institute Group.
- 14:00 'Human Factors and Ergonomics in Advanced Train Control Systems' by Kate Dobson, Senior Human Factors and Ergonomics Specialist, SNC-Lavalin.
- 14:30 Coffee Break.
- 15:00 'CBTC and Increasing Level of Automation' by Dave Keevill P.Eng, Technical Director, Parsons.
- 15:30 'Greater Diagnostic Benefits and Better Maintenance with CBTC' by Joe Greco, Manager Technical Solutions, Rail Control Solutions, Bombardier.
- 16:00 'Cyber Security and Communications Based Train Control' by Raheel Qureshi, Chief Information Security Officer, Thales Canada.
- 16:30 'CBTC 2.0 - Vehicle Centric Architecture and Train-to-Train Communications' by Naeem Ali P.Eng, Director & Principal Consultant, CBTC Solutions.
- 17:00 Adjourn.

### Friday - December 2

8:00 to 12:00 Toronto Transit Commission Technical Tour of CBTC Test and Training Facility at the TTC Car House.

The Section's third activity for 2016 was the Fifth Annual Canadian Meeting held in conjunction with the Toronto Railway Club holiday dinner on December 2nd 2016. There were over 80 attendees to this event, the most ever. It included raffles for IRSE materials and speakers on a wide range of railway topics. The main event featured presentations from rail and transit experts from around Canada as well as IRSE President Charles Page. The speakers' topics and their affiliation was as follows:

1	Charles Page	IRSE World Events	IRSE
2	Shawn Robinson	Engineering Performance Monitor	CP

## North America Section report - 2016

3	Naeem Ali	Safe Braking Model explained	CBTC solutions
4	Duwayne William	Grade Crossing Regulations and Funding	Transport Canada
5	Ryan Janzen	Hyperloop	Transpod

### 3. Plans for the next 12 months

2017 promises to be another pivotal year for the Section. We are planning a brief AGM in Indianapolis, Indiana during the massive Interchange Product show and AREMA conference in early September. Immediately following this, the IRSE's Convention (IRSECON17) will be hosted by the North America Section in Grapevine, Texas. Planning for this event has been going on for some time and it promises to be an excellent venue and opportunity for technical growth for the attendees.

We will also continue the tradition of the December Toronto, Canada Conference that precedes the Toronto Railway Club holiday dinner. In addition, it is likely that we will host another Canadian CBTC event at about the same time.

There has been interest in conducting individual meetings around North America in between these events and planning is now underway to achieve this goal.

### 4. North America Section – Officers

Chairman: David Thurston

Country Vice-President: Bill Scheerer

Secretary: Gary Young

Webmaster: Rob Burkhardt

## Switzerland Section report - 2016

### 1. Introduction

This report covers the complete business year 2016 of the Swiss Section. The Annual General Meeting was held on 11 March 2016, at which time it was reported that there were 62 members in the Section

### 2. Main Activities during the past 12 months

#### Events

During the calendar year 2016, the Section as usual organized four events (two technical visits, one dinner meeting and one paper session) according to the following overview:

Date	Topic	Type
11-Mar-2016	Gonzen Mine and Railway	Technical Visit
11-Mar-2016	AGM in Gonzen	AGM
03-Jun-2016	ERTMS	Paper Session
21-Sep-2016	Dinner Meeting at Innotrans in Berlin	Meeting
11-Nov-2016	Driverless trains, SkyMetro Zurich Airport	Technical Visit

All events were well attended, generally by far more than half of the Section's members, and at a number of events members from other Sections joined. We very much welcome this and would be delighted to increase this further. Interestingly there was no international participation at our meeting in Berlin, although there were a lot of other IRSE members at Innotrans. All these events have been reported in detail in IRSE NEWS. The selection of interdisciplinary subjects demonstrates once again one important element of the strategy of the Section.

#### Annual General Meeting

The Section held its fifth regular AGM on 11<sup>th</sup> March 2016. Heinz Walser resigned from the Swiss Section committee, having been organizing the events very successfully since founding of the Swiss Section five years ago and by doing this substantially contributed to the success of the Section. The Chairman and all the members thanked Heinz for his great work. His replacement will be accounted for in the coming AGM 2017 in combination with other Board (Committee) changes.

#### Committee

The Committee met four times during the year and discussed strategic subjects, organization of the events, membership and other matters. A major activity was planning the organization of the 2018 Convention, to be held in Lugano and Pontresina in May 2018.

#### Planning of the Convention 2018

For organizing the Convention, a dedicated organization committee has been formed, which has taken up the work on a broader basis and met multiple times in the last year. Together with IRSE HQ the budget has been finalized and the contracts for major

## **Switzerland Section report - 2016**

locations and hotels have been put in place. A very professional brochure for sponsors has been put together and we are working hard to find sponsors. The brochure is being translated from German to English.

Given the heavy engagement of active members in organizing the Convention, we expect that the event will be a great success.

### **Development of membership**

The number of Section members has remained stable in the last few years. In 2016 we were able to grow the number from 57 to 62 and there are a few more applications expected. The potential to grow to 100 members remains, given the number of guests and prospective members. The largest obstacle remains filling in the application form in English correctly!

The long planned form-filling event for prospective members was organized after the paper session on 3<sup>rd</sup> June 2016 and was successful. Nevertheless, going forward we believe that it is most promising to assign one member of the Committee with specific experience to motivate and coach prospective members individually when filling in their application forms.

The Committee continues to focus on membership development. The list of potential members was cleaned up and narrowed down to increase focus. Specific members are being encouraged to upgrade their membership level where appropriate. We are also working to identify and motivate members for functions in the Swiss and international IRSE organization.

Last year Jens Schulz joined the IRSE's International Technical Committee as a second active Swiss member, in addition to Beat Keller.

### **3. Plans for the next 12 months**

For 2017 the committee has set the following priorities for the Swiss Section:

- Organize the usual four yearly events (three technical visits and one paper session). These will be published on the IRSE HQ web site as the dates are defined. After the success of our dinner meeting in Berlin, we are thinking about setting up a few additional meetings without technical visits as opportunities for members to get together.
- Continue to focus on growing the number of members, and on membership development.
- Improve on the communication between members of the Swiss Section by taking advantage of state-of-the-art social media tools and simplifying the exchange of pictures taken at events.
- Work on organizing a spectacular Convention in 2018! The organizing committee is further detailing the planning and working on finding sponsors.

## **Switzerland Section report - 2016**

### **4. Swiss Section – Officers**

Chairman: Daniel Pixley

Country Vice-President: Dr. Rolf Gutzwiller

Secretary: Dr. Marco Lüthi

Treasurer: Rolf Seiffert

Webmasters: Beatrice Müller and Dr. Marco Lüthi

## **China Section report - 2016**

### **1. Introduction**

The formation of the IRSE China section was approved in July 2016 and the Section was formally inaugurated on 11<sup>th</sup> October 2016 during the International Convention. The Section's first AGM will be held in 2017 and recorded in a future Proceedings but the China Section nonetheless wishes to record its thanks to the Council officers, section committees and all others involved in the formation of the China Section for their suggestion and support.

At present, there are approximately 35 members in the Section.

### **2. Main Activities during the past 12 months**

#### **Executive Committee Meetings**

The China Section Executive Committee met three times in 2016, in June, August and October. All three meetings took place in Beijing Jiaotong University, the first in preparation for the formation of the China Section and the second and third in preparation for the IRSE's 2016 International Convention to Beijing.

#### **International Technical Convention 2016**

The IRSE International Technical Convention 2016 was held in Beijing, with 111 members and 45 guests from 21 countries attending between 10<sup>th</sup> and 14<sup>th</sup> October.

The event began with a Welcome Reception on the evening of Monday 10<sup>th</sup> October and on the morning of 11<sup>th</sup> October the IRSE President and Chair of the Convention, Mr Charles Page, made the opening speech. Technical papers were presented at the main Convention venue, the Shangri-La Hotel, commencing with a keynote address by Professor Ning Bin, President of Beijing Jiaotong University, while guests travelled by coach to the Summer Palace. Both members and guests enjoyed the conventional dinner at Lao She Tea Room.

Technical visits during the Convention included the Beijing Metro Line 6 signalling system and Rolling Stock Maintenance Depot on day three (12<sup>th</sup> October). On 13<sup>th</sup> October, members and guests departed from the Shangri-La Hotel for Beijing South Railway Station and boarded High Speed Train G31 from Beijing to Jinan, a journey of around 400 km. On arrival in Jinan, members and guests visited Shandong Jiaotong University and Jinan Railway Station, including the Jinan Railway Bureau Dispatching Centre and Jinan Railway Bureau CTC centre.

On the final day, 14<sup>th</sup> October, members and guests were invited to visit the Beijing High Speed Train Depot and Beijing Jiaotong University, including the State Key Laboratory of Rail Traffic Control and Safety, the National Engineering Research Centre of Rail Transportation Operation Control Systems and the Electromagnetic Compatibility Laboratory.

The Convention closed with a Gala Dinner held at the Shangri-La Hotel on the evening of 14<sup>th</sup> October.

## **China Section report - 2016**

### **3. Plans for the next 12 months**

#### **Local Technical Workshop**

With the kind support and sponsorship of the 7th IEEE International Symposium of Microwave, Antenna, Propagation and EMC Technologies (MAPE 2017), the IRSE China Section will hold a technical workshop on rail signalling and telecommunication technologies at Xi'an on 24th October 2017. This workshop is open to individuals involved in rail signalling and telecommunications systems, or who have an interest in the topics which include: maintenance of rail telecommunications, rail telecommunications application, rail signalling simulation, Chinese Next Generation Train Control and rail safety assessment and authentication in China.

#### **Annual General Meeting**

The China Section plans to conduct its first Annual General Meeting in November 2017 according to the Section's bye-laws and following the Annual Dinner. The China Section's Chairman, Bin Ning, will be invited to give an annual report of the Section's activities to all members.

#### **Section visit to Transport NSW**

Members of the China Section visited the IRSE's Australasia section and the Transport NSW event in April 2017, with a view to the organisations in China and Australia building closer co-operation and relationships. The Section plans to visit the 2018 Transport NSW event to promote further co-operation in terms of the development of rail traffic signalling and control system.

#### **Section visit to IFASTAR**

Members of the China Section will visit the French Institute of Science and Technology for Transport, Development and Networks (IFASTAR) in 2018, and hold an academic workshop in France. The workshop aims to provide professionals and researchers all over the world an opportunity to communicate and share experiences in the field of rail traffic control and telecommunications, and rail transportation.

#### **Seminars and technical visits**

The China Section plans to organise several technical meetings and seminars, which will be advertised on the Section's website. The planned Seminars include:

The China Section has scheduled a technical trip to the Polytechnic University of Turin in September 2017. The University has a strong scientific background in Electromagnetic simulation, testing and diagnostics, and the advanced antenna design for SCOM and GNSS in transportation environments.

The Section is also planning to promote academic cooperation with Griffith University in Australia, whose Railway Technical Group has gained support from the China Railway Corporation for a Rail Innovation Gateway in Australia.

The Section also plans to support ICEAA 2017 in Italy, when it is planned to hold a special session 'System Security and Safety' chaired by Professor Yinghong Wen.

## **China Section report - 2016**

### **Publications and communications**

**Website.** The IRSE China Section website provides details of all events, news and membership application operation of the section. In 2017, the membership function will be further revised on the website to enable members to update their personal information, contact details, and access booked events online.

**E-Communication.** A monthly email bulletin will be sent to all China Section members, containing information about upcoming events and other topical information. The IRSE China Section also plans to make use of social media channels like Wechat and Weibo.

### **4. China Section - Officers**

Chairman: Bin Ning

Country Vice-Presidents: Chaoying Liu, Weizhong Shi, Weizhong Huang

Secretary: Yinghong Wen

Treasurer: Daming Jiang

Webmasters: Jiang Liu

## **India Section report - 2016**

### **1. Introduction**

The Indian Section of Institution of Railway Signal Engineers was inaugurated in 2009, since when the Section has progressed very well as a professional body, due to the collective efforts of all its members.

Membership currently extends to almost all zones of the Indian Railways, various working and upcoming Metro Railways, and many International Signalling companies, as well as System Integration and Railway Signal Design companies working in India.

The Institution has furthered its objectives and principles by holding workshops and technical reviews all the year round across the length and breadth of the country and has also arranged an annual convention.

Today the IRSE India Section has a total membership of 787 members, out of which currently paid members number more than 500.

The Section's Annual general Meeting for 2016 was held on 31<sup>st</sup> October 2016 in Kolkata.

### **2. Main Activities during the past 12 months**

During the year, the Section has arranged the following activities:

- A technical visit was held on 14th May 2016 at Hatia station of the South Eastern Railway to see the electronic signalling system. This was attended by 19 IRSE and IRSTE members and was led by Shri Meena, Senior Divisional Signal and Telecom Engineer.
- The Section organized a one-month Vocational Training programme for local young people of West Bengal state in July 2016. 41 people participated in the programme, which was conducted in railway stations, signalling offices and other locations.
- A workshop on Track Sensing Technologies was held at Bokaro on 2nd September 2016 in association with Frauscher India. About 35 members of IRSE and IRSTE attended.
- A one-day seminar was held at Delhi on 20th October 2016 on Safety and Modern Signalling; about 22 attended.
- A seminar was organized, jointly with IRSTE (India), at Kolkata on 31st October 2016 on the topic of ETCS. This event was attended by 32 Signalling and Telecommunication Engineers from the Eastern and South Eastern Railways, and Kolkata Metro.
- A one-day seminar was held at Bangalore (Bengaluru Metro Rail Corporation) by the Young Members chapter of the IRSE on 4th November 2016 on the topic of 'Metro Signalling'.
- A workshop was held at Garden Reach on 10th February 2016 on the topic of 'TPWS' in which 24 signalling professionals participated.

In addition, IRSE examination study sessions have been held regularly at Bangalore by Atkins.

## **India Section report - 2016**

### **3. Plans for the next 12 months**

The following events and activities have been planned for the 12 months up to April 2017:

- 8/9th April 2017: Signalling Convention, organized by IRSE with IEEE at IIT Kharagapur.
- 25th May 2017: Workshop on modern Sensing Technologies for safe train operations at DLI.
- 6th July 2017: Visit to TPWS (ETCS) site on the North Central Railway for IRSE Members.
- 17th October 2017; IRSE Members' visit to Lucknow Metro.
- 18th November 2017: Young Members' visit to Kolkata Metro.
- 21th December 2017: Young Members' visit to Gurgaon Metro.
- 26/27th March 2018: International IRSE Seminar at Delhi.

### **4. India Section - Officers**

Chairman: Mr A K Misra

Vice-Chairman: Mr Nikhil Swami

Country Vice-President: Mr Arun Saxena

Secretary & Treasurer: Mr Anshul Gupta

Webmasters: Mr Ajai Singh

## **Indonesia Section report - 2016**

### **1. Introduction**

The last Annual General Meeting of the Indonesia Section was held on 1st April 2016. At this time there were 78 members in the Section.

### **2. Main Activities during the past 12 months**

#### **Book Donations**

The Section has continued its donation of railway signalling and telecommunication books to universities and other organisations; over a hundred have so far been handed over. The most recent donation was on 18<sup>th</sup> March 2016, when 18 books on Railway Signalling and Telecommunication subjects were presented to the Engineering Division of PT Len Railway Systems.

#### **IRSE ASEAN Seminar**

The IRSE ASEAN Seminar has the objective of facilitating interaction between the rail regulator, rail operators and the railway industry.

Indonesia intends to develop Train Control Technology, starting with ATP for use on main lines and ATO for Light Rail Transit. According to a study conducted by Bappenas (the National Planning Agency Institute) for the railway sector, this will require 7,000 maintainers and operators up to 2030. No study has yet taken place into the resources required for construction, but it is expected that this would be more than 7,000 engineers and technicians.

The Government has established STTD (Sekolah Tinggi Transportasi Darat – the State Transportation Academy) together with API (the major Indonesian railway operator), to prepare the human resources of the middle to lower level of operators and maintainers. To meet the resources required for 2030, universities and training institutes will also have to be involved and so the IRSE needs to work with the Academy and with universities and training institutes in this area.

The IRSE Indonesia Section is aware of a plan to introduce a course in Train Control at Birmingham University in the UK. The Section is seeking to facilitate cooperation between universities to assist, and has signed a Memorandum of Understanding with the Bandung Institute of Technology (ITB) and Birmingham University.

It is intended that Birmingham should produce high level or Master's degree experts, while STTD and API can produce undergraduates. The Training Institute will in addition support the acquisition of IRSE Licences for Installers, Testers and other functions.

#### **National Workshop on Education and Research in Railway Signalling**

A national workshop on education and research in Railway Signalling, Control and Automation was held on 7<sup>th</sup> April 2016 at the Engineering Physics Seminar Building at the Bandung Institute of Technology. The Workshop was conducted by the Graduate School of Instrumentation & Control, Engineering Physics Faculty and the Bandung Institute of Technology in cooperation with the IRSE Indonesia Section.

## **Indonesia Section report - 2016**

The event began with a keynote speech from Professor Deddy Kurniadi, the Dean of the Faculty of Industrial Technology, ITB. After that Ir. Adi Sufiadi Yusuf, Director of PT Len Industri and Chairman of the IRSE Indonesia Section, also gave an address.

Following the opening addresses, the official inauguration of the Masters programs took place. There are two programs :

- Double degree Master program in Signalling, Control and Automation, in collaboration with the University of Birmingham, United Kingdom.
- Master program in Control and Automation with a special interest field in Signalling, Control and Railway Automation.

### **3. Plans for the next 12 months**

- Increase the number of members in the IRSE Indonesia Section.
- Donate Signalling and Telecommunication books to universities.
- Increase the number of Indonesian Signalling and Telecommunication engineers holding IRSE licences.
- Hold a lecture in cooperation with the Graduate Program at the Bandung Institute of Technology.
- Hold a Forum Group Discussion with Universities and stakeholders on the theme of new technologies for application in railway development in Indonesia, possibly followed by a larger seminar on the subject.
- In cooperation with IRSE London, give a Scholarship (for Master's Degree or short program) for engineers and lecturers in the field of Railway Signalling and Telecommunication.

### **4. Indonesia Section - Officers**

Chairman: Ir. Adi Sufiadi Yusuf, A. M.Eng, FIRSE

Country Vice-President: Ir. Ira Nevasa, MT, MIRSE

Secretary: Ir. Toni Surakusumah, MIRSE

Treasurer: Yunanda Raharjanto, ST, AMIRSE

# **Hong Kong Section report - 2016**

## **1. Introduction**

2016 was considered one of the most successful years for the IRSE Hong Kong Section, as the seven-year dream of an IRSE China Section finally came true. The difficulties are not that easy to present in a few words but it took our committee, especially Mr K W Pang, Mr Y F Sung, Mr Charles Lung and Mr Alex Wong, tremendous effort to make it happen.

Following an initial thought from Alex Wong after his attendance at the IRSE's International Convention in 2010 in Delhi, a committee was set up to help promote the membership in China and set up the official organization. Setting up a 'foreign-connection' association in Mainland China needs the endorsement and approval of many organizations, including the China Railway Society and even the Ministry of Foreign Affairs and the wording of the Section By-laws had to satisfy both IRSE HQ requirements and regulations in China. With numerous back-and-forth negotiations and the hard work of many in Beijing, London and Hong Kong, the proposal finally got all the required signatures for approval and the IRSE Council approved the formation of the China Section in July 2016. In October 2016, a number of committee members and the Hong Kong Section Chairman went to the Beijing to witness the Inaugural Ceremony of the China Section. This coincided with the first IRSE International Convention held in China, to which the Hong Kong Section contributed much organizing activity.

Since the establishment of the IRSE Hong Kong Section in 1995, the growth of the Section has been fairly gentle, new members being mainly experienced engineers in the industry. Previous leaders of the Section developed a succession plan, targeted to get more young people from the industry, train them to be professional railway engineers, involve them in local meetings and introduce them to the committee members.

A class of Executive Members was introduced, providing an opportunity for those interested members to take a role in the Hong Kong Section, from which they could then move further up to the Committee if they find the organisation of events appealing to them.

The annual growth of the Hong Kong Section is currently 2.8%. Apart from the Chairman, Vice-Chairman and Secretary, the Hong Kong Section is now composed of 19 Committee members and 8 Executive members, providing a total workforce of 27 members. The committee members are of a good mix of ages, from the late 20s to retirees, with both male and female engineers and people based in Hong Kong, South East Asia and Australia.

## **2. Main Activities during the past 12 months**

### **Committee Meetings and AGM**

The committee members of the Hong Kong Section meet bi-monthly to discuss the strategy and planning of activities. In 2016/2017, six committee meetings were held:

## Hong Kong Section report - 2016

Committee Meetings in 2016/2017		
17 <sup>th</sup> June 2016 (AGM)	4 <sup>th</sup> July 2016	27 <sup>th</sup> September 2016
21 <sup>st</sup> November 2016	24 <sup>th</sup> January 2017	24 <sup>th</sup> March 2017

The Hong Kong Section's Annual General Meeting is held every year, together with an Annual Dinner every alternate year.

### Technical Visits

The committee members of the Section meet regularly to organize events for members. One of the most successful categories of event is the Technical Visits, the places for which are always filled up within a few days of advertisement; it would not be this successful without the help of our dedicated committee members. Visits comprise events both local and in Mainland China, including coverage of railway systems, control systems in other industries and EMC perspectives.

The following Technical Visits were held during the year:

- 21st March 2016 – Hong Kong Section Delegation visit to the Electronic Department in the Hong Kong Institute of Vocational Education (Haking Wong), led by Mr Y F Sung and Mr H M Fan.
- 25th June 2016 - Technical Visit to the Cab Simulator at the MTR Wong Chuk Hang Depot, led by Mr K P Leung.
- 10th October 2016 - Technical Visit to Shanghai Jiaotong University, led by Mr Y F Sung.
- 12<sup>th</sup> November 2016 - Technical Visit to Hong Kong Productivity Council – EMC & Reliability Testing Center, led by Mr P Y Cheung.
- 1st to 8th December 2016 – International Exchange with the IRSE China Section in Beijing, including visits to the Beijing Traffic Control Technology Smart Training Center, and the China Metro Association, led by Mr Y F Sung.

### Technical Forums

Continuous Professional Development (CPD) is a principal topic of interest for all engineering institutions and is also the key vision of the Hong Kong Section. Technical presentations covering different topics in new technology and new railway project were presented during the year at the theatre in the headquarters of the Mass Transit Railway Corporation. These Technical Forums are free of charge to attend and are also open to members of the general public, with a starting time of 6:30pm to allow commuters sufficient time to attend after work. The Forums include a networking session with refreshments and CPD certificates would be presented to those requesting registration prior to the event.

- 22nd July 2016 – 'Fully Automatic Operation of the South Island Line' by Mr Francis Li.
- 10th August 2016 – 'The Singapore N-S-E-W Line Re-signalling Project' by Mr L Y Lam.

## Hong Kong Section report - 2016

- 26th August 2016 – ‘Evolution of Signalling Technologies in Hong Kong’ by Mr Philip Wong.
- 23rd May 2017 – ‘Latest Development on DUAT Signalling Replacement Project’ by Mr Gordon Lam.

The presentation ‘The Singapore N-S-E-W Line Re-signalling Project’ by L Y Lam aroused a high level interest in local members. This was a re-signalling project replacing fixed block ATP with an advanced CBTC moving block system in a brownfield environment. The presentation gave a brief review of the legacy fixed block system and the railway infrastructure, and their limitations. The audience was interested and keen to learn about the approach to implementation of new CBTC systems on their own networks.

The Section’s immediate past Chairman, Mr. Philip Wong, presented a technical paper on ‘Evolution of Signalling Technologies in Hong Kong’ as part of the event to receive the new IRSE President, Charles Page, in August 2016. The paper offered a comprehensive review of the historical development of railway signalling in Hong Kong since 1900. The contents covered the general features and operations of the various signalling systems in Hong Kong throughout the century on the main line connecting Mainland China with Kowloon (formerly called the Kowloon-Canton Railway) and the rapid transit lines (originally called the Mass Transit Railway). The paper attracted an audience of over 40, all keen to know about the history and the technical details of the latest CBTC technology.

The DUAT Signalling Replacement Project is the biggest project in Hong Kong in the next 10 years, due to be complete by 2026. This will replace the signalling systems on six MTR lines and the Airport Express with new signalling systems using Communications Based Train Control (CBTC) technology. The six MTR lines are the Tsuen Wan Line, Island Line, Kwun Tong Line, Tsuen Kwan O Line, Disneyland Resort Line, and Tung Chung Line. The Tsuen Wan Line will be the first line to be upgraded and work commenced in January 2015. The presentation provided the latest update on the design overview, system architecture, migration strategy and current status of the Project and gave an insight into the challenges of implementing such a complex project in a ‘brownfield’ environment.

### Other Activities

- 27th May to 17th September 2016 - IRSE Exam Briefing and Study Group, led by Ms Anthea Ngai and M/s Y F Sung, Simon Lee, Terry Ip and Philip Wong.
- 31st July to 3rd August 2016 - China-ASEAN Railway Education Forum and Achievement Exhibition, led by Mr Y F Sung.
- 26th August 2016 – Visit of IRSE President, Charles Page.
- 3rd to 7th October - IRSE International Convention in Beijing.
- 15th December 2016 – Christmas Gathering.
- 15th February 2017 – Spring Dinner Gathering.
- 11th March 2017 – Beijing Technical University 2017 Traffic and Transport Program Inaugural Ceremony.

## **Hong Kong Section report - 2016**

On 26th August 2016, the IRSE President Mr Charles Page visited Hong Kong. The Section's committee members took the President to visit the MTR, which required a very tight schedule including visits to the Operations Control Centre in Tsing Yi Station and the Operations Training Centre at Kowloon Bay Depot. The President was briefed by Mr. Gordon Lam on the DUAT seven lines signalling replacement project and also met Mr. Tony Lee from MTR's senior management team and Mr. Mark Ho of the MTR Academy. The President acted as the officiating guest for the presentation made by the Section's immediate past Chairman Mr. Philip Wong and delivered an opening speech on his visit to Hong Kong Section.

Every year, the Hong Kong Section organizes Study Group to help members prepare for the IRSE Examination. Last year, 22 candidates joined the study group and 20 of them participated in the examination. The Section invited experts in the industry to explain the technical detail of each examination modules and share helpful tips and the study group additionally served as a platform for members to meet and exchange study information and idea. The majority of members benefited from the group discussions, exercises and mock exams and welcome the possibility of more classes being organized.

The Section is particularly grateful to Ms. Anthea Ngai, Mr. Simon Lee, Mr. Terry Ip and Mr. Philip Wong, who found time from their work commitments to prepare and provide guidance to the Study Group. These four professional engineers are very dedicated and have served between 5 and 10 years over the past decades on the Study Group, some volunteering for more than 15 years and special thanks are due to them for contributing to the high pass rate in the Examination, in which Modules M2 and M7 achieved the best results, with two Credits in each of M2 and M7, the latter module achieving a 88% passing rate. The pass rate for the M1 safety module was the worst and results for M3 were disappointing.

It was noticed that not all candidates enrolled in the Study Group entered for the year's exam but were interested in entering in one or two years' time, reflecting the exam attendance in the previous years. Some people from other railway-related disciplines came along to attend the Study Group showed great interest in what they regard as free lecturing, which suggests a good chance for the Institution to attract more people from the signalling industry. The Section will therefore review and look for improvement in the near future, particular in the low pass rate for the Safety and Control Table modules and aim to bring people with these interests to the Institution.

The Hong Kong section has been working closely with a number of other educational institutions including Beijing Jiaotong University in China, the Hong Kong Institute of Vocational Education (IVE), and the MTR Academy. A collaboration between the Section and Beijing Jiaotong University has led to the delivery of a 3-year distance learning BEng Program in Traffic and Transport ('BJTU-TT'). The program offers structured training for member to achieve a further step of development in their careers. A professional short course in Automatic Fare Control Systems was also delivered by the Department of Electrical Engineering at IVE, in collaboration with the Hong Kong Section.

## **Hong Kong Section report - 2016**

### **Website, Newsletter and Library**

The website provides an effective means of communication to members. Four years ago, the Hong Kong Section engaged students from the Institute of Vocational Education to develop a website which now, after several years of enhancement, manages membership and activity registration automatically and allows mass distribution of notices and newsletter to members electronically via e-mail. Members also have online access to current and past presentations, newsletters and examination materials.

The Council has expressed its gratitude for the Editorial team's hard work to regularly produce this well-regarded newsletter, an important means of communication with and between members of the Institution.

The Hong Kong Section has a list of publications and reference books all relevant to the railway industry. Not many people know the existence of the 'library', however, and the usage of the library is relatively low. Members are therefore welcome to approach Mr. H M Fan for the full catalogue.

### **3. Conclusion**

Thanks must go to our Committee Members for their overwhelming support to the IRSE's Hong Kong Section. The Committee meets regularly, organizing activities for the whole year, while there are sub-working groups for the Newsletter and the IRSE Annual Dinner, and a Technical Event Committee. Without their help, it would not have been such a fruitful and successful year for the Section.

The Committee in turn wishes to thank members for their support to the Hong Kong Section during the year and look forward to continuing attendance at meetings and functions in the future. With the hard work contributed by all the Committee members, we are confident that we are supporting the development of the next signalling generation in our industry.

### **4. Hong Kong Section - Officers**

Chairman: Mr. Pang Kwok Wai, FIRSE

Vice-Chairman: Mr. John William Manho, FIRSE

Secretary: Mr. Sung Yuen Fat, FIRSE

## **UK Section reports – 2016 - 2017**

### **LOCAL SECTION REPORTS (UK)**

The following reports have been received from the IRSE's UK Sections to report their activities over the Presidential Year 2016 – 2017. They have been edited for consistency and to provide a permanent record for the 2016 – 2017 Proceedings.

Midlands & North-Western Section

Minor Railways Section

Plymouth Section

Scottish Section

Western Section

Younger Members' Section

York Section

## **Midlands & North Western Section report: 2016 - 2017**

### **1. Chairman's Report**

First of all, on behalf of the IRSE, I would like to thank all those members of the MNW committee who, in spite of their busy schedule, have been able to attend and contribute to this year's committee. I would like to thank Bill Redfern and Melvyn Nash especially for their constant presence at meetings and events across the region, and Paul Darlington for his excellent contribution in his first year on the committee.

As Chairman, overall I was happy and satisfied that the section achieved the target of delivering a programme of lectures at various locations, a couple of technical visits and a joint meeting with the ImechE.

### **2. Theme for the 2016-2017 sessions**

During 2016 - 2017 the committee arranged to deliver key lectures on some of the most recent developments within the Rail Industry, whilst also covering major projects that have been delivered either on our area or by companies from the region. These included new industry innovations, development on existing technology platforms and latest developments on the future of Signalling.

We also deviated from the formal Engineering bias and incorporated talks on other disciplines such as the ORR and operations.

We managed to provide some technical visits to the Manchester ROC and a planned visit to the Ordsall Chord project was scheduled for May 17.

### **3. Overview of the 2016-2017 programme**

The Programme started in Manchester with a presentation by Ian Maxwell of the Office of Rail Regulator on the role of the ORR in today's railway. This proved a very interesting subject; how the ORR is evolving with the increasing demands of the railway is one not usually associated with the Section. Even the Manchester weather obliged as biblical rain and lightning arrived mid-presentation.

For the October session in Derby, Andy Munro of Siemens Glasgow presented a talk on the design, implementation and testing of the Borders Railway Project. It was excellent to hear of lines closed by Dr Beeching being reopened and how the simplistic 'island modular solution' has been used to effectively reduce costs and enhance efficient working. It was interesting to note the huge popularity of the line which may mean future expansions are required.

For November we headed to Birmingham and another new line project was the subject. Andy Free presented a very detailed assessment of the East-West Rail project and it was amusing to note that the line initially opened in 1842, achieving nearly a 200-year life span, which is incredible. Andy focussed on the delivery of phase 1 from Oxford to Bicester (BIOX), where collaborative working was the key to successful delivery with very tight timescales and a major consideration of the amount of new road works required to open the line. Passenger numbers have exceeded expectations.

## **Midlands & North Western Section report: 2016 - 2017**

The December meeting was held in Manchester, where Neil Archer and Matthew Weingarth from Network Rail presented 'Innovations in Signalling Design'. The Signalling Innovations Group is undertaking four programmes of development works and Neil and Matthew demonstrated deliverables for a new asset inventory Surveying tool, a Signal Sighting Forms tool and a new tail lamp video recorder. The future should involve much less time walking the track. An audience of up to 30 engineers enjoyed the presentation preceded by the delicious ARUP Christmas buffet - many thanks to ARUP again.

In January we headed to Crewe and Atkins' offices on Gresty Road. The turnout was again high and John Martin covered 'Future Signalling Systems by Atkins'. The excellent presentation and question session was of particular interest in terms of the industry moving towards a digital future where the use of PLCs and IP networks will become the norm.

The February meeting was held in Preston. A team of young North West Engineers - Ryan Duff, John Thompson and Pete Summers - presented an update on the work involved in 'Electrifying the North West' and the sheer scale of the works being undertaken within our region, forming part of the 'Northern Powerhouse'.

The following week a group of interested Signal Engineers joined forces with the IMechE Railway Division North Western in Manchester. Despite the meeting being on St Valentine's Day, there was a big turnout to listen to Mark Philips from the RSSB give a presentation on the 'Research at the Interfaces of the Rail System'.

March brought us back to Derby and a presentation by our committee member Ian Mitchell of Resonate on recent IECC developments. He described the evolution of the IECC signalling control system to the new scalable architecture and Flexible workstations and illustrated this with some current projects for Network Rail and others. The presentation included an excellent visit to the laboratory and testing facilities at Resonate, a huge turnout of over 50 Engineers again proving that Derby is the most popular venue.

In April the session of technical meetings concluded in Birmingham with the Annual General Meeting and a talk on Railway Operations by Nigel Murphy of Winder Phillips Associates.

#### **4. Chairman's Trophy**

This year the Chairman's Trophy was presented to Paul Darlington for his contribution to the IRSE and his long standing and continuing Signalling and Telecommunication engineering contribution to the Rail Industry.

#### **5. Midland and North-Western Section – Officers**

Chairman: Paul Toole.

Hon. Secretary: Bill Redfern.

Hon. Treasurer: Clive Williams.

Committee Members: Ian Allison, Steve Barge, Ian Bridges, Ian Fury, Tapas Haldar, Peter Halliwell, Graham Hill, Ian Mitchell, Melvyn Nash, Paul Darlington, Charlie Stanger.

## **Minor Railways Section report: 2016 - 2017**

### **1. Introduction**

The Section had yet another busy year and continued to attract members of the Institution as a result of the interesting and varied activities that are undertaken.

### **2. Main Activities during the 12 months to April 2017**

#### **Annual General Meeting and Technical Visit to the Keighley and Worth Valley Railway**

The Section's 2016 Annual General Meeting was held on Saturday 5th June in the Exhibition Shed at Oxenhope on the Keighley and Worth Valley Railway (KWVR).

The AGM was followed by Bruce MacDougall and David Harrison of the KWVR giving presentations about the line and its signalling and telecommunications systems. Lunch, served in a Pullman dining car in the Exhibition Shed, followed.

The visitors then boarded a special DMU service to Damems Junction, where the signal box and level crossing were inspected, and then on to Keighley where the signalling equipment, including that controlling the connection onto the main line was examined. The visitors then boarded the special train and returned to Oxenhope, with a few leaving the train at Haworth, where the train paused to drop off a member of staff, to complete the journey on foot.

A committee meeting took place on the DMU shortly after leaving Oxenhope.

A full report of this visit was published in issue 226 of IRSE NEWS (p.31).

#### **Signal Maintenance & Inspection Technical Workshop**

Following on from the Section's successful Cable Maintenance and Testing Course run at Signet Solutions in Derby in 2015, the Sixth Signal Maintenance and Inspection Technical Workshop was held at the same location over the weekend of 3rd and 4th September 2016. Seven students from minor railways across the country attended the event.

On Saturday, the group were taken through the basics of the law applying to railways and its requirements, the background and history of the topic, incidents and accidents and their effect on signalling development. This session also covered the need to keep good and clear records and the importance of ownership and responsibility.

This was followed by three sessions on gauging points (both mechanical and power) maintenance and cleaning, and the installation and operation of mechanical signals, testing requirements, and maintenance and cleaning of a mechanical signal. Saturday evening saw the students, committee members and instructor assemble at the Brunswick Arms, followed by a convivial meal in a local pizzeria.

On Sunday the students reassembled in the classroom for theory and practical sessions covering DC track circuits and their operation, drop shunting and testing of a track circuit, maintenance adjustment and cleaning. A brief session on risk reduction and track worker safety was delivered by Green Dragon Rail, including an overview of

## **Minor Railways Section report: 2016 - 2017**

site diagrams and records, how to keep, store and modify them, cleaning and monitoring (for wire degradation and silver migration), reporting, recording and ensuring safety.

The workshop concluded with a review and feedback session, the Award ceremony and a farewell to all the delegates who returned to their railways educated, enthused and able to put their new knowledge to good use.

A committee meeting also took place on 3rd September 2016.

A report of this Workshop was published in issue 227 of IRSE NEWS (p.26).

### **Technical Visit to the Bluebell Railway**

On Saturday 5th November 2016, 35 members and guests of the Minor Railways Section gathered at East Grinstead station to start a technical visit to the Bluebell Railway. A special train had been laid on for the group comprising a 1910 Wainwright P Class locomotive and a 1913 Observation Coach, to take them to Horsted Keynes.

The first stop was Kingscote where the modern signalling was viewed before the signal box (upper and lower portions), relay room and lineside equipment were viewed and described by volunteer tour guides. The group then re-joined the train to continue to Horsted Keynes, where once again the signal box, relay room, and lineside equipment were viewed, as well as the Signalling and Telecommunications workshops.

The group then travelled by service train to Sheffield Park, where a buffet lunch was served before the members of the group were able to visit the various attractions of the site at leisure, before boarding a service train to return to East Grinstead.

A report of this visit was published in issue 229 of IRSE NEWS (p.33).

### **January 2017 Committee Meeting**

On 28th January 2017, a Committee Meeting took place in the Stalybridge Suites in Birmingham.

### **Sponsors and support**

The Minor Railways Section would like to thank the many sponsors that have supported the section during the year, along with the many staff and volunteers of the various railways that the section has visited and to all those who attended the events.

### **3. Minor Railways Section – Officers**

Chairman: Mike Tyrrell FIRSE.

Deputy Chairman: Ron Whalley MIRSE.

Hon. Secretary: Ian Allison FIRSE.

Hon. Treasurer: Martijn Huibers FIRSE.

Visits Secretary: Mike Tyrrell FIRSE.

## **Plymouth Section report: 2016 - 2017**

### **1. Annual General Meeting**

The Annual General Meeting held at the conclusion of the 2015 - 2016 period was held at the Boringdon Park Golf Club, Plympton on 16th May 2016. A total of twelve members attended the meeting and apologies for absence were received from a further twelve.

AGM business is limited to approval of the previous minutes, matters arising, secretary's report, financial report, election of officers and discussion of potential topics for meetings for the coming session. Full minutes of the meeting have been prepared by the Secretary and logged in the section records.

### **2. Activities during the past 12 months**

The section normally attempts to hold a small number of events each year, with a mix of technical papers, social events and a technical visit. Such a process was undertaken by the committee for this year but unfortunately no events of any nature materialised. This was due to resourcing issues within the committee, caused mainly by work commitments, with a number of Plymouth-based members working away from home. A full but provisional programme was put together, but in every case arrangements were not completed in time for the events to proceed.

Two of the planned events were carried over to the forthcoming session, and following a concerted effort on behalf of the new committee to ensure that there is no repeat of this past session, a confirmed programme for 2017 - 2018 is already in place.

### **3. Plans for the next 12 months**

The Annual General Meeting concluding the 2016 - 2017 period will take place at the Boringdon Park Golf Club, Plympton on 2nd May 2017.

### **4. Plymouth Section – Officers:**

Chairman: Andrew Jones

Vice-Chairman: Dave Biss

Secretary/Treasurer: Dave Came

Financial Scrutineer: Alastair Wilson

Committee: John Lovick, Tom McClarnon, Allan Morgan.

## **Scottish Section report: 2016 - 2017**

### **1. Introduction**

This year's session has been an improvement on last, with lectures that were arranged for 2016 being well attended at the Iron Horse function room venue. However, following a committee review taking into account members' opinions, lectures from 2017 onwards will be held at our usual Annual General Meeting venue of Sloans.

We gratefully acknowledge the sponsorship of our 2016 Dinner by AECOM, with 301 guests present. With the surplus accrued from the dinner and other events, the committee will continue providing funding for training session days for younger members, as well as bursaries to allow members to attend the IRSE Exam study groups organised at Derby.

### **2. Main Activities during the past 12 months**

#### **September Lecture 'HPSS Intelligent Infrastructure' – Mike Mustard, Findlay Irvine**

The session kicked off at the Iron Horse with an informative lecture from Mike Mustard of Findlay Irvine, with a look into the delivery of the High Performance Switch System (HPSS) within the Intelligent Infrastructure program that is currently being rolled out in conjunction with Network Rail.

Findlay Irvine has developed a wireless interface that transmits data from the machine to Network Rail. The presentation covered 'the what and the how' but also mentioned the development journey from a Supplier's perspective.

The numbers could have been better for this programme opening lecture, but the people who attended spoke very highly of the topic and the Q&A session continued until the refreshments were served downstairs.

Attendance: Members 9, Guests 1

#### **October Lecture 'MSRP Process' – David Warwick, Network Rail**

Our second lecture of this year's programme was well attended with David Warwick from Network Rail providing a very thought-provoking lecture on the Major Scheme Review Panel process.

David provided a history of the process, why it is important and how it works and benefits signalling scheme production as a whole, with examples of scheme issues the review panel has come across to illustrate the logic.

This was a much better-attended event, with another long-lasting Q&A session.

Attendance: Members 24, Guests 9

#### **November Lecture 'A Vision for Scotland's Railways' – Jonathan Pugh, Network Rail**

Jonathan Pugh of Network Rail agreed to present the lecture preceding the Annual Dinner.

The presentation discussed how Scotland's railway is continuing to develop and expand with increasing demand for more and faster services.

## **Scottish Section report: 2016 - 2017**

This lecture explored a short history of railway strategy, together with a vision of what future industry planning, and the railway network in Scotland, could look like. It also covered what enhancements are under consideration in the near future and how these could be planned and structured.

The topic was very well received and attended, with different companies being represented during the question and answer session following the presentation.

The lecture was followed by the Annual Dinner which was kindly sponsored by AECOM.

Attendance: Members 47, Guests 45 – Dinner 301.

A report of this event was published in issue 230 of IRSE NEWS (p.33).

### **January Lecture 'Thameslink' – Steve Chatfield and Steve Smith, Siemens**

The first lecture at the new venue of Sloans was given by Steve Chatfield and Steve Smith of Siemens with a strong local attendance and the 'two Steves' presented their current major undertaking within the Thameslink works.

Thameslink is two major projects combined: the remodelling of London Bridge, and the delivery of an ETCS/ATO system to provide 24 trains per hour capacity in the core section.

The presentation covered the scope of the project, why it is needed, the drivers behind it and the many challenges faced during implementation to satisfy such demanding performance criteria.

Attendance: Members 22, Guests 11

### **February Lecture 'Operational Voice over IP' – Graham Smith, Grant Kilgour and Mark Donnelly, Network Rail**

Our Telecomms lecture of the session, delivered by Graham Smith, Grant Kilgour and Mark Donnelly of Network Rail (NR), detailed the concept of safety critical communication over internet protocol (IP).

Network Rail has been challenged with finding new and innovative ways of delivering its telecoms commitments for major projects. One method of achieving this has been to embrace Commercial off the Shelf (COTS) technology for most of its telecoms requirements. Whether it be helping NR realise its Regional Operating Centre (ROC) strategy, delivering savings on electrification projects or the replacement of legacy TDM and PABX equipment, NR has over the last few years explored the heady new world of operational voice delivered using voice over internet protocol (VoIP).

A very interesting lecture was followed by an intense Q&A session.

Attendance: Members 14, Guests 10.

## **Scottish Section report: 2016 - 2017**

### **March: Family Day – Riverside Museum and Tall Ship**

The section organised a trip to the local transport museum, which included a sponsored tour of the ship Glenlee, and included lunch for all that attended.

Attendance: Members 5, Guests 21

### **April: Annual General Meeting**

Our session ended in April with a joint Annual General Meeting and Quiz Night, held in Sloans, with a buffet included.

Attendance: Members 15, Guests 1

### **3. Scottish Section – Officers:**

Chairman: Neil Thomson.

Vice-Chairman and IRSE Exam Coordinator: Frazer Howie.

Secretary: Gerry Loughran.

Treasurer: Brian McKendrick.

Younger Members: Jonny Calderwood, Craig Kerrigan.

Communications: Barry Young.

Committee: Simon Lowe, Steve Wright, Jack Worrall, Craig Hourston, Ricky Scarff, Paul Smith.

## **Western Section report: 2016 - 2017**

### **1. Introduction**

The Western Section held its Annual General Meeting on 5<sup>th</sup> October 2016, followed by the first of the session's technical presentations.

### **4. Main Activities during the past 12 months**

#### **Technical Meeting – 5<sup>th</sup> October 2016**

The subject of the first of the season's presentations was the Automated Verification of Interlocking Data using formal proof via Prover technology tools.

The speaker was Peter Duggan from Siemens and the meeting was held at Network Rail's Swindon offices.

#### **Technical Meeting – 2<sup>nd</sup> November 2016**

The subject of this presentation was 'Embedded Carbon and is it relevant to the rail industry?'.

The speaker was Inga Doak from Siemens, and the meeting was held in Siemens' Chippenham offices.

#### **Technical Meeting – 7<sup>th</sup> December 2016**

The title of this presentation was 'Soft Fringe'. Fringe work is a significant part of any re-signalling scheme and when the commissioning strategy for a project changes, the potential impact of re-design for additional fringe work can be significant.

The presentation showed the thinking behind the development and implementation of a solution to the problem when a job which was planned for a single data stage was commissioned in three stages without the need for interlocking data alterations while still delivering a normal presentation to the driver at what has become known as the 'soft fringe'.

The speakers were Paul Munday and Peter Martell from Network Rail and the meeting was held in Amey Rail's Bristol offices.

#### **Technical Meeting – 1<sup>st</sup> February 2017**

The subject of this presentation was the forthcoming rolling stock transformation on Great Western Railway. This will involve the introduction of new Electric Multiple Units in the Thames Valley, and new bi-mode Hitachi Intercity Express Trains for use on long distance services, together with the resultant cascade of existing rolling stock elsewhere within the franchise.

The speaker was Andy Mellors from Great Western Railway and the meeting was held in Siemens' Chippenham offices. This was a joint IRSE/IET seminar.

## **Western Section report: 2016 - 2017**

### **Technical Meeting – 1<sup>st</sup> March 2017**

This presentation was an introduction to Network Rail's safety transformation strategy for level crossings, the roles of the asset technical policy and technology strategy which support it, and some of the current developments which are taking place or are planned in order to deliver these policies.

It also covered the Rail Industry Readiness Levels process which Network Rail will be progressively adopting to measure the readiness of new developments for operational deployment.

The speaker was Ed Rollings from Network Rail and the meeting was held in Network Rail's Swindon offices.

### **Technical Meeting – 5<sup>th</sup> April 2017**

This was the final presentation of the season. The subject was Reliability, Availability and Maintainability, the factors which affect RAM and its influence on the railway systems life cycle.

The speaker was Chandra Tummalapalli from Systra and the meeting was held in AECOM's Swindon offices.

## **2. Western Section - Officers**

Chairman: Simon Cooper.

Vice-Chairman: Adam Allen.

Hon. Secretary: Tug Wilson.

Committee: Peter Martell, Martin Beard, Peter Duggan, Andy Scarisbrick.

## **Younger Members' Section report: 2016 - 2017**

### **1. Introduction**

The Younger Members' Section has continued to receive great support from younger and more experienced members alike in 2016. The beginning of the year saw the arrival of new Chairman Matt Slade and the increase in size of the Committee to eight, with the hope of delivering on the Section's remit to engage younger members and provide opportunities for networking and knowledge sharing across the signalling industry's younger community.

### **2. Main Activities during the past 12 months**

#### **Technical Visits**

##### **Aldwych, disused Underground station**

On 29<sup>th</sup> January 2016 the IRSE Younger Members made a long-awaited visit to the hidden treasure of the disused Aldwych Station beneath the streets of London, which was kindly sponsored and supported by London Underground.

This very rare opportunity provide the visitors with an insight into how the station operated when it was first opened and its slow decline from singling of the track in 1917 to its closure to the public in 1994.

The popularity of the event can be gauged from the number of visitors attending, such that it was necessary to divide the group into two separate groups of 15 for the tours.

The committee has extended its sincere appreciation to London Underground, who also arranged complimentary tickets for entry to the London Transport Museum at Covent Garden following the visit to Aldwych.

A report of this event was published in issue 227 of IRSE NEWS (p.27).

##### **Hitachi ETCS Simulator at ENIF**

On 4<sup>th</sup> March 2016 the Section visited the ETCS National Integration Facility (ENIF) at Hitchin, supported by Hitachi Rail Europe.

Visitors were able to see the Hitachi ETCS simulator in operation and experience simulated travel in ETCS level 2 from Paddington to Reading with explanation from Hitachi staff.

##### **Great Western Train Care Depot, Reading**

The IRSE Younger Members visited the Great Western Railway (GWR) train care depot at Reading on 3<sup>rd</sup> June 2016, supported by Great Western Railway staff.

The visit consisted of two parts, beginning with a presentation from one of the senior train care staff which included:

- a brief overview of GWR, in particular the London Thames Valley Network;
- work that is carried out at Reading Train Care Depot;
- the depot's future plans – Rolling stock and infrastructure.

## **Younger Members' Section report: 2016 - 2017**

Following the presentation, there was a tour of the facilities, including:

- servicing and heavy maintenance buildings;
- Train Movement Control – the depot's own signalling panel.

This visit provides delegates with a good opportunity to see a side of railway operations rarely available to the signalling engineer.

### **Crossrail Integration Facility, Westferry, London**

On 24<sup>th</sup> February 2017, the Section visited the Crossrail Integration Facility (CIF) located at Westferry, in London's Docklands. The visit was supported by Crossrail and included a tour of the CIF facility, encompassing the facility's equipment and control room. Following the tour, representatives from Crossrail delivered presentation on the signalling system; this was followed by a question and answer session.

### **Annual General Meeting, Exam Review and half-day seminar**

As a follow-on to the visit to the Crossrail Integration Facility, on 23rd March 2017 the Section welcomed Siemens to speak on the Crossrail Core Signalling and their TrainguardMT system.

The 2016 Thorrowgood Scholar, Tom Corker, gave a presentation on the Japanese Railway following his recent trip to Japan (both JR East and JR West), as well as the renowned Railway Technical Research Institute in Tokyo (an article describing these visits was published in issue 232 of IRSE NEWS (p.13)) and Duncan Robb from SNC Lavalin looked to the future beyond GSM-R to explore what is in store for railway telecommunications.

For those with an eye on the upcoming examinations, especially Module 1, Yewande Gbadegesin from Siemens delivered a presentation on Engineering Safety Management and Younger Members' veteran and first class study aid Peter Woodbridge shared some of his wisdom and advice on preparing for the IRSE Exams.

Following the Seminar, an Exam Review was held, covering the good and the bad from the previous year's papers and providing vital feedback to those preparing to sit the examination in 2016.

### **International Technical Visit to Lisbon, Portugal**

Between 14<sup>th</sup> and 17<sup>th</sup> April 2017, a group from the Younger Members' Section travelled to Lisbon and, hosted by supported by Transportes de Lisboa, visited the Lisbon Metro. This included visits to the Blue Line Depot and the Metro system's Operational Control Centre (OCC), from which all four lines are controlled and supervised. Later, the group visited two of the system's station interlockings, which employ a mix of Westrace and relay technologies.

On the second day of the trip the delegate visited the Lisbon Transport Museum, followed by free time to travel and explore Lisbon's varied transport systems including Metro ferries and trams.

A report of this event was published in issue 225 of IRSE NEWS (p.28).

## **Younger Members' Section report: 2016 - 2017**

### **Annual Seminar and Technical Visit, Glasgow**

November saw the Younger Members' flagship event, the Annual Seminar and Technical Visit, move north of the border to Glasgow for the first time in recent history, supported by Siemens and CPC Systems.

On 9th November, the event 'Enhancing Rail Capacity Across the UK' welcomed a range of presenters, from operators and clients to suppliers and consultants, the locality ensuring a good stock of fresh faces and conversation. The following day the attendees were treated to a tour of Strathclyde Partnership for Transport's (SPT) Glasgow Subway Depot at Broomloan, followed by attendance at the IRSE Scottish Section's Annual Dinner.

A report of this event was published in issue 231 of IRSE NEWS (p.29).

### **Exam Study Days**

The Section has continued to deliver on its commitment to provide study opportunities for the IRSE Exam. With the continued kind support of Peter Woodbridge, David Nicholson and Reuben Dakin, among others, two Exam Study events were hosted, a Modules 1 and 7 study day, supported by Atkins, on 23rd April 2016 and a Modules 2, 3 and 5 Study Weekend, supported by Signet, on 2<sup>nd</sup> and 3rd July 2016.

Both events were well attended and were gratefully received by younger members, standing them on solid ground for their exam preparation.

### **Summary**

Overall, it was a successful year for the Younger Members, setting a benchmark for 2017. We hope to see many more fresh faces and some of the older ones (you know who you are!) at our events in the near future.

Anyone wishing to joining the Youngers Members Committee or help organise events should email [younger.members@irse.org](mailto:younger.members@irse.org). We are always grateful for new ideas and input.

### **3. Younger Members' Section - Officers**

Chairman: Matt Slade.

General Secretary: Keith Upton

Publicity Secretary: Michael Bastow.

Treasurer: Kevin Gardner.

Council Representative: Helen Kellaway.

Committee: Vivich Silapasoonthorn, Mohammad Sekanderzada, Richard Brown, Alud Jones.

## **York Section report: 2016 - 2017**

### **1. Introduction**

The Section held its Annual General Meeting on 14<sup>th</sup> 2016, when Doug Gillanders was elected as Chairman for the forthcoming session. The title of the Chairman's address was 'The Lost Railways of Yorkshire'.

16 members attended this meeting.

### **2. Main Activities during the past 12 months**

#### **North Eastern Railways Engineers' Forum – 20 September 2016**

The North Eastern Railway Engineers' Forum for 2016 was held at Network Rail's York Engineers' Triangle (YET), the home of the York ROC (Rail Operating Centre), on 20 September. This was the 19th annual Forum, bringing together the ICE, IMechE, IET and PWI as well as the IRSE, with generous sponsorship from Sabre Rail, to cover the whole range of railway engineering. A total of 115 delegates attended the event.

Four papers were delivered: on the ongoing concentration of signalling into the ROC; an update by Hitachi Rail Europe of their developments within the UK; a presentation by ElectroMotive Diesel on their depot at Doncaster, from which they service the traction requirements of GB Railfreight and others, and by Nexus (Tyne and Wear Metro) on the engineering aspects of Metro.

A report of the Forum was published in issue 229 of IRSE NEWS (p.35).

#### **Technical Meeting - 27<sup>th</sup> October 2016**

The Section's 2016/17 session began with a paper entitled 'A Young Signal Engineer's Experiences' by Matt Dunn of Network Rail on 27th October in George Stephenson House, courtesy of Network Rail. This paper, in which Matt related his experiences on the North Yorkshire Moors Railway prior to joining his current employer, was to try to address the shortage of young engineers attending the local meetings, which had limited success. 17 members and visitors attended the meeting.

#### **Technical Meeting – 24<sup>th</sup> November 2016**

The November paper was held on the 24th November in George Stephenson House, again by courtesy of Network Rail. 20 members and visitors heard the presentation on 'The Borders Railway' by Andy Munro of Siemens Rail Automation. He gave an overview of the re-construction of the line from the mainline out of Edinburgh to the new terminus at Tweedbank.

Both these meetings were reported in issue 230 of IRSE NEWS (p.32).

#### **Technical Meeting – 14<sup>th</sup> December 2016**

The December meeting took place in the York Engineers' Triangle where the local Network Rail Maintenance Team paired up with a team from Thales to provide a presentation combined with demonstrations on 'How Intelligent is our Infrastructure?' This was a follow-up to the demonstration given by the same Network Rail Maintenance Team during the 2015/16 session and looked at how technology

## **York Section report: 2016 - 2017**

combined with modern communications allowed the Maintainer to make informed decisions quicker and with more accuracy, when addressing with Infrastructure issues. It was well attended by 28 members and visitors.

### **Technical Meeting – 12<sup>th</sup> January 2017**

The fourth meeting of the session had to be hastily re-arranged when the original presenter had to withdraw shortly ahead of the meeting due to commercial constraints imposed by the HS2 project. Quentin MacDonald stepped into the breach and gave a presentation entitled 'HS2 – High Speed to Failure' which looked at an alternative approach to the introduction of the new high speed line and was attended by 26 members and visitors.

Network Rail hosted the meeting at George Stephenson House.

### **Technical Meeting – 9<sup>th</sup> February 2017**

The February meeting was a presentation by Tony Pope of Siemens Rail Automation entitled 'Reading Re-modelling'. This gave an overview of the large project covering the station's reconstruction, the flyover construction and the new train maintenance facilities as well as the complete layout re-modelling. He made use of some very interesting time-lapse videos produced for the project. The meeting was attended by 33 members and visitors.

A report of both the January and February meetings was published in issue 232 of IRSE NEWS (p.28).

### **Technical Meeting – 23<sup>rd</sup> March**

The final technical meeting of the session was held on 23rd March, hosted by Network Rail in George Stephenson House. This was a telecoms-themed presentation, entitled 'XNET-TE Video Codec' by Mark Marriage of Digital Barriers on the use of modern video techniques to get high quality pictures through a small bandwidth. It was attended by 26 members and visitors.

### **York Section Annual Dinner**

The York Section Annual Dinner took place on 10th March 2017 and was a break with the traditional dinner format and venue type in an effort to increase its popularity back to that of a number of years ago. This year it was a dinner only and the venue was the National Railway Museum. The result was indeed popular, with a high quality dinner served in prestigious surroundings to around 145 people for less than £45 per head. Siemens generously provided sponsorship for the dinner for which the Section is very grateful.

One of the members of the section is keen to get the younger members more interested in the IRSE and its events and meetings. To this end she is planning to provide exam seminars for them and attempt to persuade them that it is not only in their career interest but also is interesting in its own right to be more involved. She has recently managed to persuade two of the younger members to attend a London

## **York Section report: 2016 - 2017**

based Young Professionals meeting as a start. The Section will continue to encourage her in her efforts over the next year.

### **3. York Section – Officers**

Chairman: Doug Gillanders.

Secretary: Tony Pinkstone.

Treasurer: Tony Kornas.