



Institution of Railway Signal Engineers

# Annual Report

Number 109

1 January to 31 December 2021

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This Annual Report briefly describes the activities undertaken by the Institution of Railway Signal Engineers (IRSE) throughout the world during 2021. Our President from April 2021 has been Ian Bridges from the United Kingdom.

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

Follow us on Twitter @IRSEHQ

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# IRSE ///

Institution of Railway Signal Engineers

The  
**Professional Engineering Institution**  
for all those engaged or interested in  
**railway signalling, control and**  
**communications**  
and allied disciplines

Around **5000** members in  
locations **across the world**

Providing world-class **presentations, seminars,**  
**conventions** and **conferences**

Industry leading competence assessment and  
**licensing**  
scheme

The world's leading  
**professional examination**  
for railway signalling, control and communications

**11** issues of  
**IRSE News**  
each year: our specialist railway signalling, control  
and communications magazine

**23 Sections**  
representing the needs of members in their  
geographic region or specialism

Accredited by the  
Engineering Council to add  
**Chartered Engineers, Incorporated**  
**Engineers and Engineering Technicians**  
to the Professional Register

Vibrant  
**Younger Members**  
Section

Run by  
**engineers for engineers**

Founded in **1912**

# An introduction from our President

Referring back to Daniel Woodland's introduction for the Annual Report last year, he stated "From March onwards, the 2020 year proved to be a difficult and most unusual one for many of our members, both in their personal and professional lives". Unfortunately, that theme continued through the remainder of 2020, into 2021.

This, of course has impacted the way the Institution has been required to operate and caused many alterations to my plans as President. Travel within the UK and beyond has been almost impossible to plan, with frequent changes to red, amber, and green lists, so regrettably I have not been able to visit any of our non-UK sections during my tenure, something I was really looking forward to. It is not all been bad news though. Through the wonders of modern technology my programme of presidential lectures has been delivered through webinars from countries far and wide, including the USA, the Netherlands, Thailand, China and the UK. I offer my thanks to all those who have contributed to "The Age of The Intelligent Railway", often making themselves available for presentations or Q&A sessions at unsociable hours in their own country. I was also able to deliver another successful joint institution event, enhancing our relationship with other Professional Engineering Institutions (PEIs) and with the Railway Industry Association (RIA) and providing a lot of information on High Performing Flexible Railway Systems for the Future.

The Governance Review Working Group has taken several topics forward throughout the year, evolving the way in which better representation is provided for those based outside the UK, making us more representative of our worldwide membership.

During a brief lull in the UK Covid-19 restrictions during 2021, we managed to hold a Member's Lunch in London, the first function I was able to attend in person along with just under 50 others. There was a feeling of euphoria on the day following the long period of restrictions on our mobility, not something railway people accepted easily. This was followed by the York Section dinner, the Minor Railways bi-annual seminar at Kidderminster and some UK section visits.

Returning to my theme for the year, it has provided a fascinating insight into how the industry can make the best of data that is available to us within the railway system. Modern electronic equipment can produce vast amounts of data, which can be collected and stored, but the advancements that are being made are in how to process that data and provide meaningful output. Sometimes the data is already being collected and it just needs to be analysed, sometimes other small amounts of supplementary data can build a much-improved picture for the railway maintainers. This improved knowledge of how the infrastructure is performing allows for less maintenance visits, thereby reducing 'boot on the ballast', our carbon footprint and provides greater knowledge of when a component is likely to fail. We have also seen how this technology can be extended to vehicle fleets, and even replacing current complex assets with much simpler components, using data to build the big picture.



It would not have been possible to deliver my programme and that of the wider institution, had it not been for the great support of the staff and volunteers. Like other businesses, the team has had to work from home, creating logistical issues at the outset. However, through regular on-line team meetings, it has been possible to overcome these problems and a normal service has been provided to our members and other stakeholders in all respects. Members too, have continued to support the Institution throughout by providing lectures and attending events, often in very large numbers, so thank you to you also. The enforced use of webinar technology has had a positive side effect, which is that there are now many hours of recorded material available for members to watch at their leisure from anywhere on the globe, without needing to leave their lounge.

Thank you for your support in what has been a difficult time for us all.

Ian Bridges, President 2021-22

# Objectives of the Institution

The Institution’s objectives are recorded in its Articles of Association. They can be traced back to the formation of the Institution in 1912 and are:

- a) 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
- b) 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 all 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 delivery of examinations at certificate and advanced level which contribute to the assurance of knowledge gained. In addition, through the application of the Engineering Council UK licenses the assessment and entry of Chartered, Incorporated and Engineering Technicians onto the Register of Professional Engineers;
- The provision and management of the IRSE Licensing Scheme to assure the competence of those working in the profession. The Scheme is focussed predominantly, but not exclusively, on ensuring safety in the design, construction, testing and maintenance of signalling and telecommunications systems;

- Our 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 and efficiency of railways.

By bringing the IRSE Sections around the world together, we will facilitate the sharing of best practice and new initiatives to help engineers and others enhance their knowledge and professionalism. We will continue to reach out and grow our network of professionals around the world to harness the collective knowledge they possess for the benefit of all operators and users of railway transport.

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 their volunteer activities. 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

We are well into the delivery of our "Beyond a 2020 vision". Details are available on the website at [irse.info/strategy](http://irse.info/strategy).

The objective of making the IRSE accessible to members 24 hours a day seven days a week throughout the year, as long as you have an internet connection, has continued to serve the Institution well during the global pandemic. This report will build on how over the past year we have adapted to meet the challenges of a locked down world, whilst at the same time increasing the benefits to members using alternatives to face-to-face meetings and engaging with a larger number of international members than ever before.

The ongoing commitment of the staff and volunteers has had an impact on a number of our operational areas aligned with our key focuses of **Engage, Grow, Develop, Network** and **Assure**. A study of the key indicators within this report will show an increase in all of these areas.

The Council has implemented many of the changes that came about through their governance review working group which has facilitated a broader engagement with our global membership

which will in future afford a greater balance of representation at Council irrespective of where those members reside. More changes next year will see a greater emphasis on the IRSE's global presence.

To compensate for the inability to offer an Aspect or Convention several alternative on-line solutions were provided with high profile speakers and content relevant to the emerging challenges of operating a rail transport

service in a pandemic. The work of the local section coordinator has been essential in helping to maintain engagement with international sections and provide feedback on the changing priorities in lockdown.

We continue to make improvements to the website in the light of operational experience and the statistics later in this report will testify to the impact this is having in the Engage element of our strategy.

The IRSE vision is to:  
***Deliver Safe and Sustainable Global Railways***

**IRSE** **ENGAGE GROW NETWORK DEVELOP ASSURE**

To **ENGAGE** with and **GROW** a global **NETWORK** of railway signal and telecommunications engineers in order to **DEVELOP** and **ASSURE** high standards of ethics, knowledge, competence and safety in all aspects of train control.

## The five key elements of the IRSE strategic plan are



### Engage

Digital platform for a global professional body 24/7/365, early careers support, communicate best practice in ethics, diversity, inclusion, produce technical documentation, knowledge transfer activities.



### Grow

Peer recognition, professional development, practice support and guidance, support in professional obligations, Advance profession.



### Network

Global local section development, International Technical Committee support, conferences, seminars and conventions, facilitate collaboration, latest information and news.



### Develop

Signpost professional development, awards & bursaries, upskilling and re-skilling, examination, apprenticeships, promote benefits to the public.



### Assure

International professional recognition, flexible pathways to professional registration, offer regulation in professional conduct, operate the licensing scheme.



# Governance

## Council

As a result of changes adopted at the AGM in April the IRSE is now governed by an elected Council of twenty-two Corporate Members, who are the Trustees of the Institution, led by the President.

Six meetings of the Council were held during the year in which the business of the Institution was conducted. The Articles of Association permit the current Chairs 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 Chairs and Country Vice-Presidents attended meetings all of which were conducted via video conferencing.

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

- Adoption of the revised Memorandum and Articles of Association
- Changes to the election process to move to a three-year term of office for all Council members
- Receiving and agreeing the findings of the fees working group
- Developing a long-term succession plan for the office of President

- The creation of portfolio holders drawn from the Council membership to examine topics including equality, diversity and inclusion and professional development of engineers.

Council also receives and reviews the annual report from each of the sections of the IRSE.

## 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 below. In addition, ad-hoc working groups are formed from time to time which focus on specific tasks. To assist in driving key areas of the Institution some members of Council have been allocated portfolios of responsibility.

## Audit

### External Audit

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

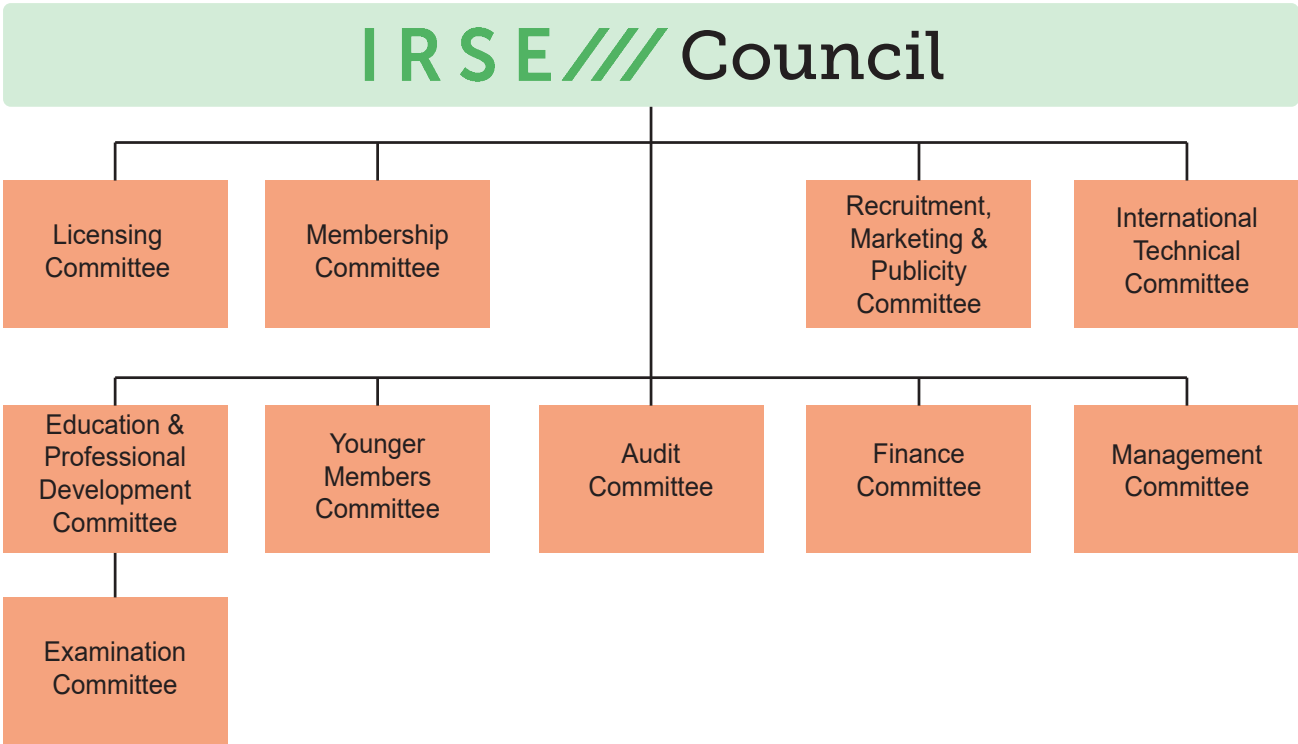
- All areas of finance are subject to audit annually by independent external auditors who submit their report to the Annual General Meeting;

- 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 in the UK to register Chartered and Incorporated Engineers and Engineering Technicians, it is subject to a review every five years by the Engineering Council in order to ensure compliance with their registration standards.

## 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, which is presented to the Chair of that committee, the Chief Executive 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. The Institution maintains a Risk Register, which is reviewed annually by Council, and this is used as the basis for audit.

## IRSE Enterprises

IRSE Enterprises Ltd is the trading company wholly owned by the Institution. The trading company handles several activities which are associated with but outside the direct scope of the charity.

Following a review of the governance of Enterprises Board and on the advice of the IRSE firm of Solicitors (Tozer's) an additional member of the board was appointed with specific responsibility for the Licensing scheme. This aspect of Enterprises activity was deemed to be of such significance that it should have its own non-executive director.

The Directors of the company appointed for the year April 2021 to April 2022 were:

- Chairman (Immediate Past President): Daniel Woodland
- President: Ian Bridges
- Senior Vice President: Andy Knight
- Junior Vice-President: Steve Boshier
- Junior Vice-President: Yuji Hairo
- Licensing Committee Representative: Paul McSharry
- IRSE Treasurer: Andrew Smith
- Company Secretary (CEO): Blane Judd

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 Bye-laws) that have been approved by Council. At the end of 2020 there were

23 sections in total. 15 Sections outside the UK in various parts of the world (Australasia, China, France, Hong Kong, India, Indonesia, Ireland, Japan, Malaysia, Netherlands, North America, Singapore, Southern Africa, Swiss, Thailand) and six of which are UK-based. The North America Section includes the USA, Canada and Mexico. The Ireland Section includes both Northern Ireland and the Republic of Ireland.

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.

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.

# IRSE volunteers

The Institution is heavily reliant on, and is very grateful to all its volunteers, without whom the Institution would not be able to perform all its duties, supporting the governance, running and reputation of the IRSE locally and internationally.

Just some of the areas in which our volunteers play a vital role are shown below.

Our volunteers develop useful skills, knowledge, experience and networking contacts through the work which they do for the Institution which they may not get the opportunity to gain within a work environment.

If you are interested in becoming a volunteer for to the IRSE, please contact your local section or [hq@irse.org](mailto:hq@irse.org) saying how you would like to contribute.

*Thank you, as an IRSE volunteer you are an essential part of our institution.*

IRSE Governance (Council, Management Committee, Finance Committee)

Membership & Registration Committee

Independent Case Panel

IRSE ///

Professional Registration assessors and interviewers

Audit Committee

Education & Professional Development Committee

Exam Committee

Exam question setters, markers, moderators, help desk people, study group leaders and tutors

Licensing Committee

International Technical Committee

Younger Members Committee

Local sections committees in the UK and worldwide

IRSE News editorial and production team

Visit, conference, seminar and event organisers

Ad hoc working groups, e.g. textbooks

# Professional development

Supporting professional development of IRSE members and prospective members throughout the world is a key objective of the IRSE.

To do this, we have Judith Ward, our Director of Operations, the Education and Professional Development (E&PD) Committee and the Examination Committee.

## IRSE Professional Examination

The IRSE professional examination is a Masters-level academic qualification which tests knowledge and understanding of railway systems with a particular emphasis on safety.

A new module was introduced in October 2020, the Certificate in Railway Control Engineering Fundamentals, which covers all aspects of railway control engineering at a foundation level and is a stand-alone qualification. This is also the mandatory starting module for anyone wishing to pass the full exam, now known as the Advanced Diploma in Railway Control Engineering. To complete the Advanced Diploma, candidates must pass three further modules covering railway safety and systems, principles and applications of railway control and communications engineering.

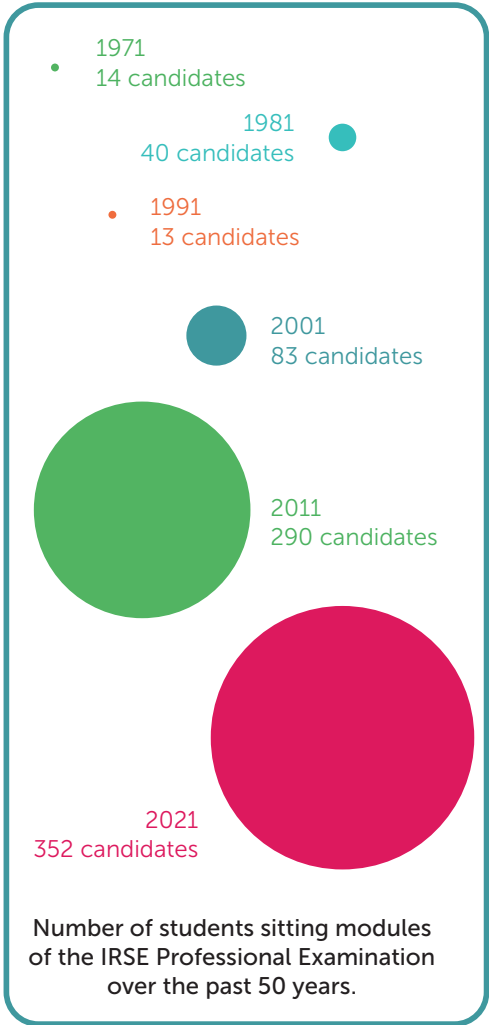
Passing the IRSE professional exam is one route to obtain Corporate membership of the IRSE and it can 'top up' engineering

or technology qualifications for professional registration with UK's Engineering Council.

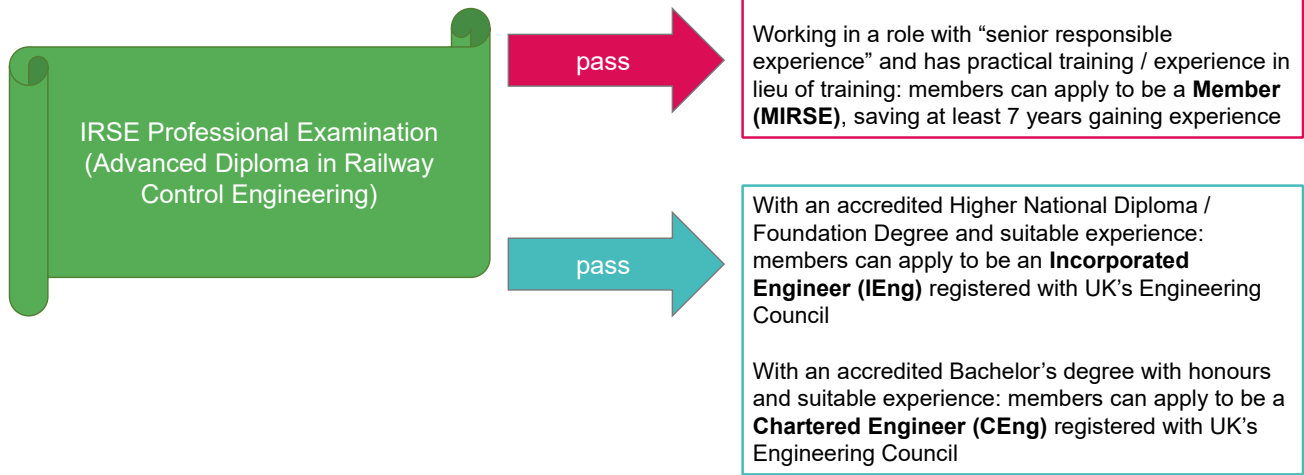
Many volunteers run exam study groups, the independent exam forum website and support the Younger Members' exam workshops to provide support for prospective examination candidates. All these continued to be run remotely throughout 2021 and Education and Professional Development Committee extend their thanks to all those who contributed to these various learning opportunities.

To enable our exam candidates to sit the exam in 2021, Education and Professional Development Committee agreed to hold the exam remotely again, with 375 candidates sitting the exam on 2 October. There has been a significant increase in the number of candidates since the exam started, as shown in the chart.

One of the advantages of the professional exam being online has been the geographic reach of the examination. In 2021, candidates sat the exam in 24 countries, many of which are not covered by sections, such as Denmark, Kuwait, Nigeria, and the Kingdom of Saudi Arabia. The quality of answers from candidates was slightly higher than last year, with the overall percentage of those achieving pass grade or higher was 61%.



The benefits of passing the IRSE Professional Examination include a route to corporate membership of the IRSE and Professional Registration.





## Equivalence to the IRSE Professional Examination

Council has endorsed E&PD's recommendations that the University of Birmingham (UoB) Railway Safety and Control Systems (RSCS) MSc should be formally considered equivalent to the IRSE Professional Exam.

From 2021, individuals awarded an RSCS MSc by the University should be exempt from taking the IRSE Exam, and on award of the MSc should also be awarded by the IRSE an Advanced Diploma in Railway Control Engineering.

The granting of equivalence of the UoB RSCS MSc should be pre-dated to 2018. Individuals who have been awarded the UoB RSCS MSc prior to 2021 should be exempt from the IRSE Exam. However, they should NOT be awarded the IRSE Advanced Diploma in Railway Control Engineering since this was not available to those passing the IRSE Exam prior to 2021.

## Continuing Professional Development (CPD)

The Engineering Council requires that as of 2020, those who do not engage in the CPD monitoring process are removed from their register. Information about the importance of developing and maintaining members' professional competence through CPD has continued to be provided through IRSE News and the website.

The IRSE recommends the use of the 'Mycareerpath' system for CPD planning, recording, reflecting and reviewing. More information about Mycareerpath is available on the IRSE website.

# Licensing

The IRSE Licensing Scheme continued to provide assurance for the competence of individuals to carry out technical safety critical or safety-related work on rail control systems throughout 2021. The Licensing Team continued to work from home, going into the office only very periodically in order to print licences, when government guidance permitted.

The team continued to deliver against the Scheme procedures and to the annual 2021 action plan, which was completed to deadline. During 2021 the Scheme was managed by Licensing Registrar, Sarah Loutfi, who joined IRSE in July 2020. Sarah worked closely with the Licensing Committee, which is chaired by Colin Porter.

### Engineering Technician (EngTech)

- Applies proven techniques and procedures to solve practical engineering problems, and
- Applies safe systems of work

### Incorporated Engineer (IEng)

- Maintains and manages applications of current and developing technology, and may undertake engineering design, development, manufacture, construction and operation

### Chartered Engineer (CEng)

- Develops solutions to engineering problems using new or existing technologies, through innovation, creativity and change
- May be accountable for complex systems with significant levels of risk

The current Engineering Council UK descriptors for each level of Professional Registration.

## Certified courses

The IRSE offers a process by which training providers can have their courses assessed and certificated by the IRSE.

This year ASAP Mobility, EtoE Transportation Training Services and Intellex gained IRSE certification for their courses covering railway signalling and telecommunications.

Other training providers are in the process of having their signalling and telecommunications courses assessed.

## Professional Registration

The IRSE had its license renewed by the UK's Engineering Council in 2021 to register suitably qualified members as Chartered Engineer (CEng), Incorporated Engineer (IEng) and Engineering Technician (EngTech).

The requirements for these are defined by the Engineering Council for knowledge, understanding, competence, relevant work experience and commitment. Brief definitions are shown in the chart above.

## Apprenticeships

IRSE have been an End Point Assessment Organisation (EPAO) for two English apprenticeships: Rail Engineering Design Technician (Level 3) and Rail Engineering Technician (Level 3). Due to lack of resources, the IRSE is unable to support the industry by remaining an EPAO and will be removing themselves from the register during 2022.

The Licensing Team, comprising the Registrar, Deputy Registrar and two Licensing Officers was joined in June 2021 by a Licensing Co-ordinator Sarah Gillis, who provides admin support.

During the year, a total of 1477 licences were issued, which is an increase of 401 on the 2020 licences issued figure, showing a good recovery from the Covid-19 period.

As at December 2021 there were c.5759 active licence holders which represents a slight decrease in the total no of licences held (c.5816 at December 2020).

For operations within the UK, the Licensing Scheme continues to hold full accreditation by the United Kingdom

Accreditation Service (UKAS) following its interim audit in April 2021, against the competence standard for the certification of persons: ISO17024:2012, with four yearly re-accreditation successfully achieved during 2018. The next 4 year accreditation assessment is due to take place in March 2022.

IRSE Assessing Agents are approved and appointed for the purposes of performing assessments of candidates for licences, and they are an essential part of the Licensing Scheme. The number of approved assessing agencies now stands at 25 as Amey closed their assessing agency during 2021.

# Membership and Registration

Remote, home-based working has remained in place throughout 2021 due to the Covid-19 pandemic and has resulted in Membership Committee meetings and professional registration interviews being held online using Microsoft Teams. The time and contribution of all involved is invaluable to the membership and registration process and is much appreciated.

We have processed 353 successful membership applications during 2021, 155 for corporate grades and 198 for non-corporate grades, there have also been 81 successful applications from members wanting to transfer to a different grade of membership.

The Membership and Registration Team has undertaken a thorough cleanse of our database during 2021 to ensure that the membership figures being reported are as accurate as possible. This work resulted in a significant number of memberships being deactivated due to non-payment of subscriptions going back a number of years despite the individual debtors being reminded using a number of communication methods.

Despite the above activity the total number of members has still increased slightly over last year's reported figure, with 4,937 members as of 31 December 2021.



The IRSE has around 5000 members worldwide. They belong to the following grades of membership:

- <1% Companions
- 1% Hon Fellows
- 4% Accredited Technicians
- 11% Fellows
- 21% Associate Members
- 24% Affiliates
- 38% Members

During 2021 the IRSE has supported 73 engineers to achieve professional registration with the Engineering Council, the UK regulatory body for the engineering profession – 24 Chartered Engineers (CEng), 15 Incorporated Engineers (IEng) and 33 Engineering Technicians (EngTech). This represents an increase of 44 over 2020.

After a full audit carried out by the Engineering Council in September, the IRSE successfully retained its licence to register engineers against the three titles – CEng, IEng and EngTech. The IRSE has also reviewed its registration processes and documentation as part of the introduction of the revised

Engineering Council's Standards for professional registration – UK Standard for Professional Engineering Competence and Commitment (UK-SPEC 4th edition).

The Institution was sad to report the deaths of the following members during 2021: David Bickell, Keith Hannah, Brian Hesketh, Leslie Lawrence, Melvyn Nash, Joseph Noffsinger, Dennis Sharp, Brian Smith, Walter Sweetenham and Martin Wilkins. A number of these members were particularly strong supporters of the Institution for a considerable number of years, and in various ways had made significant contributions to the Institution's work.

## The benefits of IRSE membership align with our strategic themes



### Engage

You can have a greater impact across the whole of the engineering community, collaborating with partners to help solve challenges of the future because of the wider network of influencers involved with the Institution.



### Grow

Being part of a growing and vibrant Institution amplifies individual voices within the industry, creating greater influence.



### Network

By facilitating interactions globally, the Institution provides the opportunity to meet and share knowledge and experience with high-profile senior engineers working together to delivery safe and sustainable railways.



### Develop

The Institution supports the continual professional development of members' knowledge of railway signalling, control and communications engineering through technical publications and papers, seminars, conferences and examination programmes.



### Assure

Membership of the Institution brings international recognition of professional competence and a route to professional registration.

# Awards

The IRSE makes several 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.

## Dell Award

### Bridget Thomson

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 (or its successor bodies) 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 with the recipient's name being added each year.

The winner in 2021 was Bridget Thomson who is Principal Engineering Leader in Transport for London Engineering. Bridget has led the way promoting best practice within the business and the use of the IRSE licensing scheme. Bridget has been a licensing champion and technical mentor since 2005. She has sat on the committee for the Signal & Electrical Engineers' Technical Society for 30 years.



## IRSE-Signet Award

### Kauser Ismailjee



The IRSE-Signet award is the most recent award, introduced in 2016 and sponsored by Signet Solutions. 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 provides funding for the winner to attend the IRSE Convention.

The 2021 winner, Kauser Ismailjee is a Project Engineer for the Paddington to Heathrow ETCS project at Network Rail.

She achieved 87% in her Safety of Railway Signalling and Communications (module 1) and also successfully passed her IRSE Professional Examination in 2020.

## IRSE Honorary Fellows

### Claire Porter and Peter Symons

Honorary Fellowships of the IRSE are bestowed by Council on members in who have rendered outstanding or exceptional services to the Profession, or the Institution, or have furthered the objects of the Institution, and are deemed by the Council worthy of such admission. (Byelaw 2.3).

In 2021 Claire Porter and Peter Symons were made Honorary Fellows. Claire is Head of Transport Systems and Chief Technical Officer for Transport for London and became the Institution's first female President in 2011 where she played an active role in the development and modernisation of the IRSE. She has continued to support the profession as leader of the current development of the new Metro Signalling book, which

will enable many of those embarking on a career in signalling a significant insight into Metros.

Peter Symons was president of the IRSE from 2017-18 and retired as technical director of Tritun Pty in 2018. He was the representative for the Australasian Section on UK Council for many years as Country Vice President, is an active Council member and currently a co-opted past President. He was made an Honorary Fellow this year for his contribution to the industry thought senior management roles with major supplier organisations as well as combining his project management skills with signalling system knowledge in various roles as a consultant and contractor to the major rail organisations.





## IRSE Companion

### David Horne



Council has the power to admit as Companions persons who are, by their association with the Profession, or through their occupation of a position of eminence, desirous of furthering the objectives of the Institution and (in the opinion of the Council) are worthy of such admission. (Byelaw 2.4) This year David Horne Managing Director of LNER and an affiliate member of the IRSE accepted the offer to become a Companion. David has been the

Managing Director of London North Eastern Railway since its formation in 2018. He leads the LNER executive team, who have recently introduced the Azuma trains and are working in partnership with Network Rail to provide £1.2bn of infrastructure improvements through the East Coast Upgrade Delivery Board.

David also chairs the East Coast Digital Programme industry steering board and is a non-executive director of RSSB.

## IRSE Merit Award

### Hedley Calderbank and Mick Ward

The Merit Award was introduced in 2007 in order to recognise exceptional service to the Institution by a volunteer or staff member anywhere in the world. The award is made by the Council following receipt of a nomination and takes the form of a plaque mounted on a rectangular plinth with an engraved citation.

In 2021 Merit Awards were awarded to Mick Ward FIRSE (pictured top right) and Hedley Calderbank FIRSE. Founding member and Secretary of the South East Section, Mick Ward received recognition for his lead role in adopting and rolling out the Exam Online

platform, his support and commitment to the delivery of the IRSE professional examinations online for the first time in 2020 and his part in the development of the Certificate in Railway Control Engineering Fundamentals.

Hedley Calderbank's Merit Award recognised his many years of support for the presidential lectures, international conventions and his recent services to the South East section, together with the development of the new modules A-D and taking of the IRSE professional examinations online. Hedley is pictured bottom right.



## Frank Hewlett Bequest and Alan Fisher Memorial Fund

Frank Hewlett was an Associate Member of the Institution. He died in September 2008 and left a very generous and substantial bequest 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 normal times the income from the two

funds is used predominantly to provide a number of travelling bursaries for younger members from all over the world to support their attendance at major IRSE events. For 2021, once again as a result of the pandemic, the funds paid for free places to be made available to younger members to on the virtual High Speed Railways Seminar, run jointly by the IRSE, IET, IMechE, PWI, RIA and IRO.

## Thorrowgood Scholarship

The Thorrowgood scholarship is awarded under a bequest of the late W J Thorrowgood (Past President) to assist the development of a young engineer employed in the signalling and telecommunications field of engineering.

The award is made to a candidate who has excelled in the IRSE professional examination and comprises an engraved medallion and funding for a study tour of railway signalling installations or signalling manufacturing facilities.

For the 2021 award no candidates achieved the necessary criteria in the 2020 examination.

# Presidential programme

Each year the IRSE President plans a programme of major events, comprising a series of high-profile technical papers, face to face events and visits to IRSE sections across the world. Once again, Covid-19 social distancing restrictions prevented personal contact for most of 2021, including the IRSE Annual Dinner, so all events were held online as interactive webinars, 'hosted' internationally.

Our President to April 2021 was Daniel Woodland whose presidential theme was 'The challenges of change in complex command, control and signalling systems'. The final two papers in Dr Woodland's year were 'Digital resilience maturity matrix for the railway sector' presented in January by Alzbeta Helienek and Mathijs Arends and 'Automation in railway control centres' presented by Ian Mitchell and Dublin-based Nora Balfe in February.

Ian Bridges, our President for twelve months from April 2021, chose 'The age of the Intelligent Railway' as the

theme for his year. Ian had planned his Presidential Programme hoping papers could be presented in person to audiences across the world as he visited the international sections, but sadly Covid-19 dictated that the papers once again had to be delivered remotely online from each country followed by an interactive question and answer session. 'Measurement systems and machine learning' was the subject of his first paper presented in the UK by Jonathan Owen and Richard Parkinson, followed by Austria-based Martin Rosenberger's paper 'Improving railway operations with data driven technology' delivered in August. The third paper delivered by Paul Hendriks in the Netherlands was on the subject of 'Intelligent railways – Big Data' and the final paper of 2021 was given in November by USA based Rajendra Jadhav on 'Leveraging machine vision and data analytics'.

In addition to the traditional programme of Presidential papers, the IRSE also hosted two major industry seminars in

2021. In June, the IRSE organised the first online conference to be held following the lifting of Covid-19 restrictions on UK rail travel. Sponsored by Siemens Mobility, 'Return to Rail – the Challenge' event delivered 18 presentations from key industry figures. The full programme can be viewed at [returntorail.com](http://returntorail.com).

Following on from the success of the 2020 Joint Institution seminar on 'Automated Railways', the IRSE collaborated once again in the autumn of 2021 with the Permanent Way Institution (PWI), Institution of Mechanical Engineers (IMechE), The Institution of Engineering and Technology (IET), the Railway Industry Association (RIA) and the Chartered Institution of Railway Operators (CIRO) to present a paid for two-day online seminar on the theme of "High Performing Railways".

All presidential papers are published in our monthly journal, IRSE News, and the presentations are available to watch on the IRSE Vimeo channel [irse.info/vimeo](http://irse.info/vimeo) or on the IRSE website.

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THE CHALLENGE**  
FREE ONLINE CONFERENCE

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CROSS INDUSTRY PERSPECTIVE**  
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Cyber Incident – it doesn't have to be a malicious attack

**Cyber security: Digital resilience maturity matrix for the railway sector**

More from Presidential Lecture Series 2020-2021

Other security (B...  
The IRSE  
TMS and further a...  
The IRSE

In the IRSE of our series of presidential lectures, Alzbeta Helienek and Mathijs Arends from Siemens Rail will consider the 'resilient' issue of Cyber Security. Cyber security has become a critical part of delivering a safe, efficient and reliable railway. It is not just about protecting the railway from cyber attacks, but also about ensuring that the railway can continue to operate in the event of a cyber incident. This session will explore the challenges of cyber security in the railway sector and the role of digital resilience in ensuring the railway can continue to operate in the event of a cyber incident.

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**IRSE ///** PERMANENT WAY INSTITUTION IET The Institution of Engineering and Technology RIA Railway Industry Association CIRO Chartered Institution of Railway Operators

**IRSE ///**  
Measurement systems and machine learning

Jonathan Owen and Richard Parkinson

This first paper in the 2021/22 presidential programme, was presented on-line on 27 May 2021. A recording of the event can be found at [irse.info/vimeo](http://irse.info/vimeo).

The railway relies on complex measurement systems and associated signalling equipment to ensure the safe and efficient operation of the rail network. With increasing capacity demands, it is essential to ensure that the measurement systems are able to provide accurate and reliable data to the signalling system.

Any time a paper is presented, it is essential to ensure that the paper is relevant to the railway industry. In this case, the paper is relevant to the railway industry as it discusses the challenges of measurement systems and the role of machine learning in improving the accuracy and reliability of the measurement systems.

Level crossing monitoring

Level crossing monitoring is a critical safety issue for the railway industry. It is essential to ensure that level crossing monitoring systems are able to provide accurate and reliable data to the signalling system. This paper discusses the challenges of level crossing monitoring and the role of machine learning in improving the accuracy and reliability of the measurement systems.

Remote condition monitoring and automated measurement systems are the key



# Section activities

In addition to the Presidential Programme, every year there is a programme of lectures, seminars and technical visits organised by the Institution's 21 sections across the globe. Our sections are in Australasia, China, France, Hong Kong, India, Indonesia, Ireland, Japan, Malaysia, Netherlands, North America, Singapore, Switzerland, Thailand, and Southern Africa. Within the UK, sections cover London & South East, Midland & North Western, Plymouth, Scottish, Western, York and Minor Railways.

The geographical sections vary considerably in size (from around 20 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.

For the second year running, many sections were unable to meet face-to-face for the majority of 2021. Some sections provided virtual meetings for their section members, which continued to attract large number of attendees. Several of these technical presentations were recorded and can be found on IRSE's Vimeo channel ([irse.info/vimeo](https://vimeo.com/irse)). Other sections were unable to provide these opportunities due to technical difficulties, the workload of the volunteers and, for some, fatigue of continuing to work and socialise via video conferencing. Some sections did manage to meet face-to-face on occasion, including the Swiss Section's

AGM, the Minor Railways Section's biennial technical seminar and the York Section's annual dinner.

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 particularly in this challenging year. 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. Charles Page continues his excellent work in the role of Local Section Coordinator, supporting the sections.

## Younger Members

The Younger Members Section is open to all IRSE members under 35 years old, or those within the first ten years of being in the industry. This year has been very similar to 2020 as we continued to hold events online. This has enabled us to reach out and engage with many other Younger Members around the globe who could not attend our UK based face-to-face events.

We began 2021 with an online version of the YM Convention with a day-long seminar of papers from a broad range of speakers across the globe on a variety of topics. This was held at the weekend to ensure higher levels of attendance from members whose work commitments prevent them from attending weekday events.

Other activities this year (all available to view on the IRSE Vimeo channel at [irse.info/vimeo](https://vimeo.com/irse)) included:

- ETCS webinar series of five sessions which covered an introduction to the system, current projects and the future of ETCS.
- We launched our series on 'Signalling systems around the world' starting in August with an interactive session online with Younger Members working in the Netherlands. More sessions with Younger Members around the world have been scheduled for 2022.
- Online study days and resources. Helping other members study for the IRSE Professional Exam and expand their industry knowledge continues

to be is a key aim for the Younger Members Section. Whilst we had hoped to hold in-person study days again this year alongside online sessions sadly the pandemic continued to prevent this. However we held a series of online study sessions all of which were well attended and have been added to our online suite of study resources.

We welcome members from around the world to share in this experience and thank everyone who has supported the section in realising its ambitions.



## International Technical Committee

The IRSE's International Technical Committee (ITC) has 23 fully participating and 12 corresponding members from many parts of the world, including Australia, Belgium, Canada, Finland, France, Germany, Japan, the Netherlands, Spain, Switzerland, Singapore and the UK. There is also a Younger Members representative.

The ITC's primary purpose is to provide papers on strategic or technical topics relevant to train control and communications systems in the railway

environment. Its particular strength lies in its international membership at a senior level, enabling engineering principles and practices from a diverse range of countries to be brought to bear upon the subjects that ITC covers. The ITC tailors some of its papers to coincide with the presidential theme of the year. During the year, the ITC held four meetings, all online. There was a plan to return to in person meetings but the Covid-19 restrictions prevented that from happening.

The ITC produced nine papers during 2021, all of which have been published in IRSE News. Two presidential papers were presented by ITC members. There are approximately 17 papers either in progress or planned for the future. All completed ITC papers can be found on the IRSE website. ITC Members have also provided expertise for the IRSE textbooks in progress this year.

# London office and personnel

The Institution leases a small suite of offices on the 4th floor of the Institution of Mechanical Engineers building at 1 Birdcage Walk, London, UK, from where the centrally organised activities of the Institution are managed – membership, licensing, events administration and financial administration.

The Covid-19 pandemic has meant that the offices have not been accessible since March 2020. As a result, all staff have had to make the transition to working from home. The Council and many members have on numerous occasions praised the efforts of the staff in maintaining a high level of professional service despite this significant disturbance to work patterns. It became apparent that there was a need to restructure in order to meet the differing demands of a distributed workforce and Council have overseen the work done by the Chief Executive and senior staff to effect these changes.

## Chief Executive

The Chief Executive and General Secretary of the Institution is Blane Judd, a Chartered Engineer and Fellow of

the Institution of Engineering and Technology. He 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 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 compliance with the requirements of the Institution's Articles of Association, Companies House, the Charities Commission and relevant legislation.

## Office team

As of the 31 December 2021, our organisation is as shown in the chart below.

Most notable of those who have left us is Hilary Cohen, who due to ill health did not return to work. Hilary gave

12 years of dedicated service to the IRSE. Hannah Mueller has moved to a different role after six years with us.

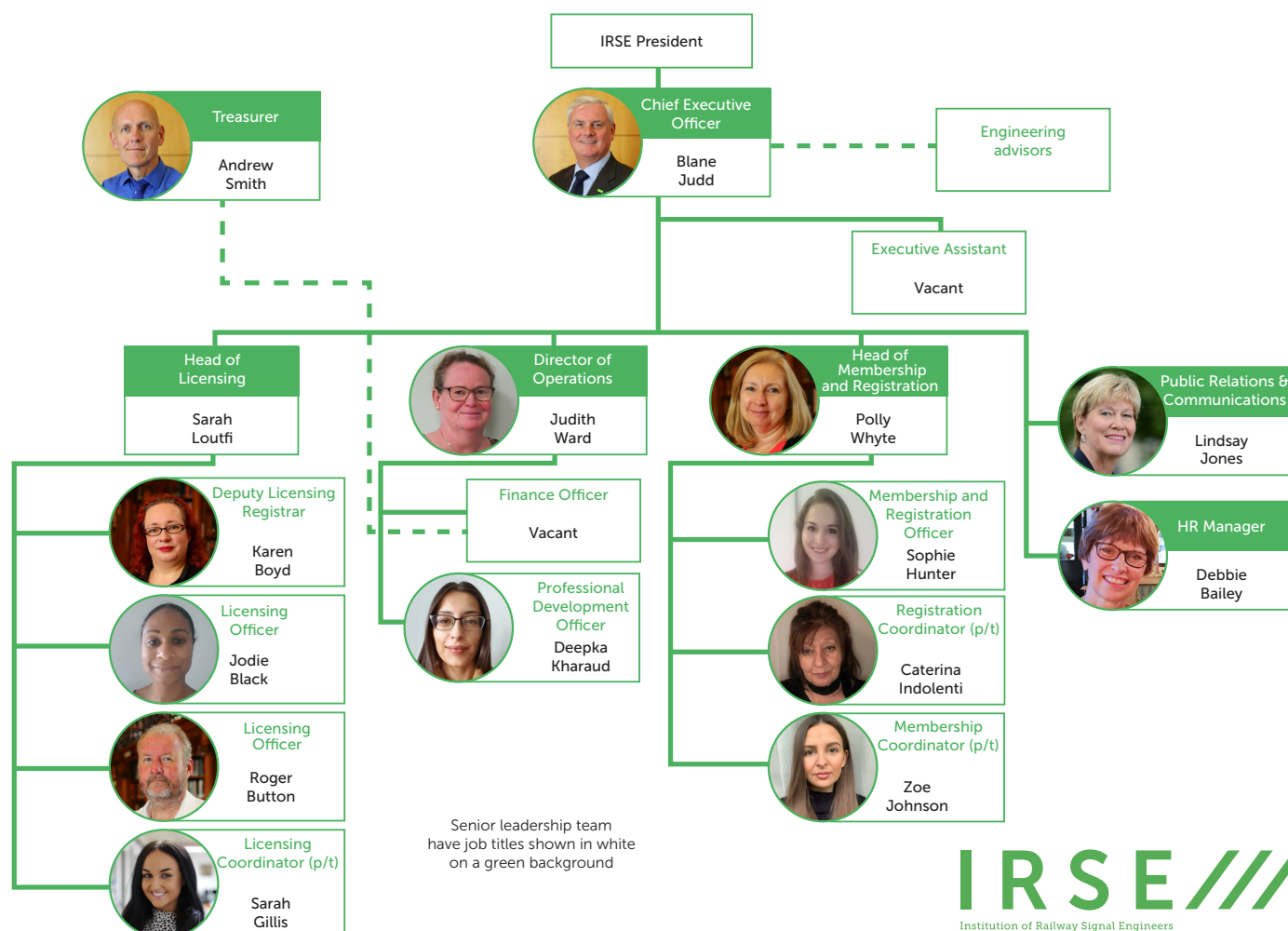
## Contract support

The following members of the team work on a part-time contract basis.

Marketing and communication activities have been operated externally by Lindsay Jones of LJPR Ltd. Lindsay is a qualified journalist with an MSc in PR and she is successfully promoting the Institution to a much wider International stakeholder group. We are also receiving excellent support from Howard Elwyn-Jones of Prettybright on a wide range of social media activity, which includes the much-improved e-bulletin and video livestreaming of events.

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 HR Manager and is a Chartered Member of the Chartered Institute of Personnel and Development.



# Annual General Meeting

The IRSE held its first virtual Annual General Meeting, on 22 April 2021, which was chaired by the retiring President, Daniel Woodland, in accordance with the Memorandum and Articles of Association. At this meeting the membership was asked to vote on the adoption of a revised set of Memorandum and Articles of Association. The main revisions saw a move from two-year terms of office for Council members to three-year terms. To facilitate this there was a reduction in the number of Fellows by one, to nine. That appointment being replaced by a second Junior Vice President position. There was also the addition of another Associate Members representative making three in total.

The overall Council number increased by one to twenty-two elected members in total. The revisited Memorandum and Articles were unanimously adopted. These changes also facilitate future changes next year to create a more balanced global representation on Council. All ordinary business was concluded at this meeting, and it was resolved to appoint HPH Chartered Accountants for 2022.

The membership received copies of the Annual Report for 2020 (published on 1 April 2021), and there being no comments or questions received through correspondence this report was adopted.

The ballot for the election of members to Council had resulted in Andy Stringer (UK) joining Council. The changes in the Council constitution resulted in new vacant seats into which Council appointed Jane Copperthwaite (Member) and Georgina Hartwell (Associate Member) in accordance with their powers as listed in the Articles of Association. The addition of a second Junior Vice President saw Yuji Hirao elevated to that position. The Council unanimously agreed to ask Charles Page as a Past President and Section Co-ordinator to remain on Council as Co-opted Past President to assist with the support of the sections.

Martin Fenner retired from the Council at the AGM, and was thanked for all his hard work over the past years.

## IRSE Council

### IRSE Council 2021-2022

IRSE Council 2021-2022	
President	Ian Bridges
Vice Presidents	Andy Knight, Steve Boshier, Yuji Hirao
Members of Council from the class of Fellow	Peter Allan, Ian J Allison, Harvinder Bhatia, Bogdan Godziejewski, Gordon Lam, Rod Muttram, Jane Power, Clive Roberts, Andy Stringer
Members of Council from the class of Member	Firas Al-Tahan, Rob Burkhardt, Rob Cooke, Jane Copperthwaite, Ryan Gould, Paul McSharry
Members of Council from the class of Associate Member	Xiaolu Rao, Georgina Hartwell, Keith Upton
Co-opted Past Presidents	George Clark, Charles Page, Daniel Woodland
Chief Executive	Blane Judd
Treasurer	Andrew Smith

## Members' Lunch

Sadly this year's Annual Dinner had to be cancelled due to the pandemic and social distancing regulations, however after a delay enforced by further Covid-19 restrictions, 1 September saw the Union Jack Club in Waterloo, London, hosting the 2021 Members' Lunch. Clive Kessell, who was responsible for creating the first lunch during his Presidency in 1999/2000, took on the challenge of organising the event. 50 members signed up to attend the face-to-face event, the first held for around 16 months following lockdowns and restrictions on meeting inside. Following the lunch, Clive gave an enjoyable presentation to the assembled company, covering notable topics from signalling and telecoms in the railway industry over the last 12 months or so.

Following Clive's talk, the President took to the stage, where his first duty was to present a Merit Award to Hedley Calderbank as explained on p12 of this report.

The President then went on to inform the audience how the IRSE had been performing over the previous 12 months including the work being undertaken by the Governance Review Working Group, membership and registration statistics and some of the plans returning things to a degree of normality as soon as possible. Convivial conversation followed the talks, allowing those attending to share stories old and new.



# IT systems

The three major IT components that support the Institution's operations are the membership and licensing database, the website, and the office IT systems.

We continue to use the full suite of Microsoft products including Microsoft Teams as both a virtual meeting product and as a VoIP for our phone system. This has been a great support to all staff working remotely during the pandemic.

We continue to develop our membership offering through the website. Additions such as the licence checker tool are helping to support users to get the best value from this 24/7/365 service. The inclusion of video content has continued to deliver a significant increase in the number of visits to the site.

Members are also able to use the site to update personal information independently.

Although we have moved to using MS Teams for the majority of meetings, we still hold additional licenses for the online conferencing tool, GoToMeeting (GTM), to support sections. As a result, all of the meetings that IRSE hold, both as part of its normal operational activities and with volunteers, has seen a large increase in membership engagement. We intend to continue to offer this service for the foreseeable future. The combination of GTM and Microsoft Teams has meant we have reached significantly more of the membership than we have been able to achieve in the past.

We are now holding the IRSE examination online as a permanent change of format. The platform we use, Moodle, has a lot of additional functionality which we are becoming more proficient in using as we become more familiar with its capabilities. There was a failure of the remote proctoring software (invigilation), during the examination in October, but we have offered candidates the opportunity to re-sit the examination at no charge if they are not happy with the results they obtained.

Thank you to all those who work for or with the Institution, including the volunteer network. Their ability to adapt so well to the challenges that we have faced as a result of the pandemic has been a tremendous help.

# Publications and communications

Nobody expected the global Covid-19 pandemic to continue into another year. Whilst it had a severe impact on the Institution's traditional face-to-face offerings including the Annual Dinner and Presidential events, we built on the learnings and knowledge gained last year and further enhanced our digital output driven entirely in-house with the assistance of the IRSE News team, volunteers and Prettybright.

All of the Presidential Programme was delivered virtually through interactive webinars, and local sections were able to use IRSE GoTo meeting and webinar licences for online events. As a result we kept members informed via frequent e-bulletins and provided enhanced content on [www.irse.org](http://www.irse.org) and our vimeo channel [irse.info/vimeo](http://irse.info/vimeo)

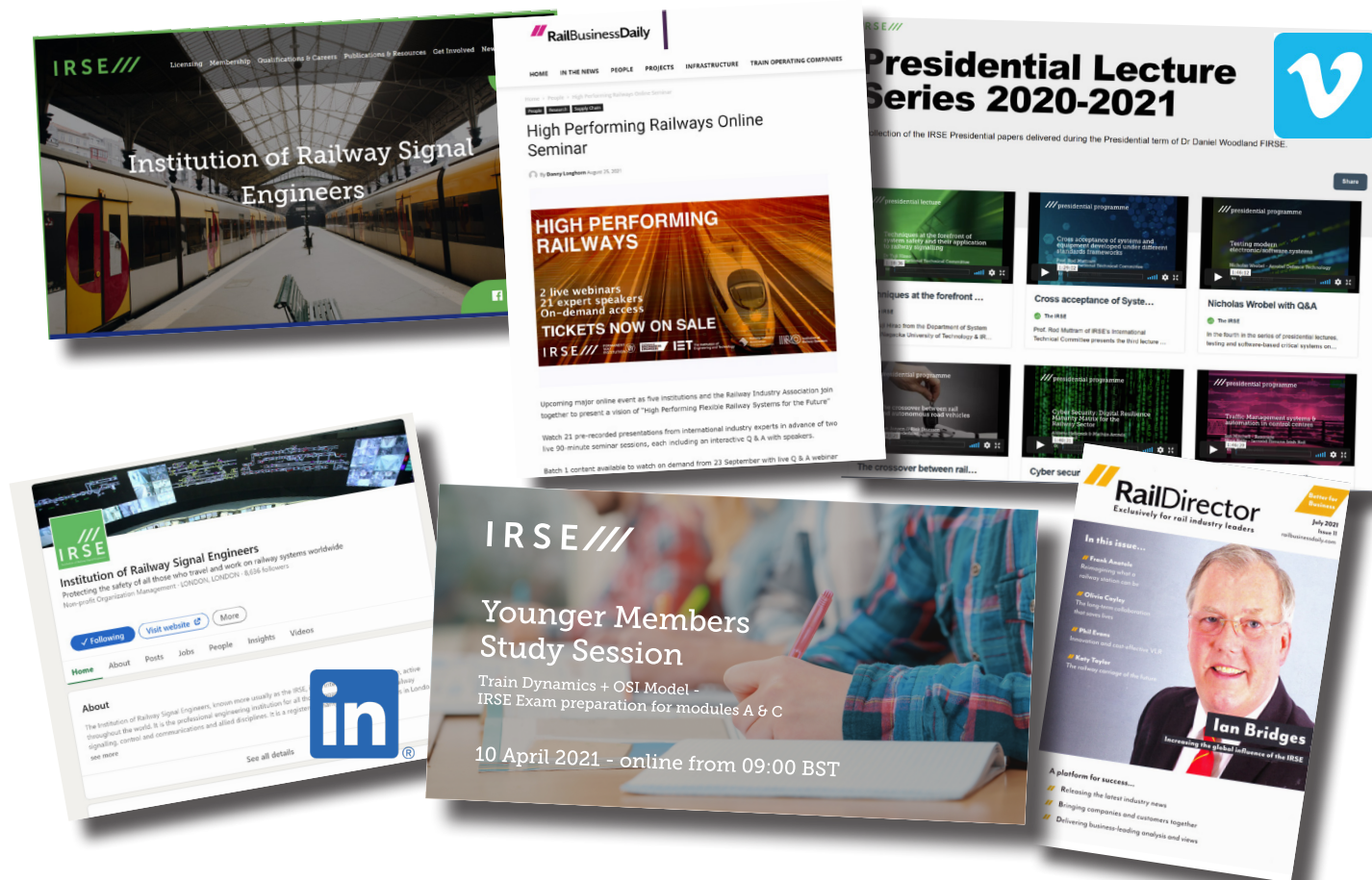
We were proud to have been the first organisation to deliver an online conference on the challenges of returning to rail just days after the UK Government lifted Covid-19 restrictions on rail travel in June 2021. Viewers from 33 different countries joined online to watch 18 different industry-leading presentations. The 'Return to rail – the challenge' conference can be viewed at [returntorail.com](http://returntorail.com). Following the success of last year's online event we also organised and presented the second paid-for joint institution seminar in November (see p13).

In all cases a far higher number of members attended the events virtually than ever before as a result even when it is possible to hold face-to-face events again, online and hybrid events will remain a key aspect of the IRSE communications strategy.

## IRSE News

IRSE News is published monthly, except August, 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. We'd like to extend our thanks to the dedicated and hard-working editorial production team and committee led by Managing Editor Paul Darlington and Production Manager Mark Glover for another excellent year.





## Proceedings

The Proceedings provide a summary of the Institution's activities and have been produced annually since the very first issue in 1913. A hard copy of the Proceedings is supplied to the British Library and to the library of the Institution of Engineering and Technology. PDF versions of the Proceedings are available on our website.

## 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, and 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 publications, and pay their subscriptions online. This year saw an increase in traffic of over 20% from 2020 with 161 000 active sessions by 78 000 users.

## Video

During 2021 the number of videos available on the IRSE website increased significantly as we uploaded content including presidential events, section meetings and study guides. As a result in the past 12 months our content was viewed over 16 200 times, a total watch time of over 224 days!

## E-Communications

A monthly email bulletin is sent to all members, containing information about upcoming events and other topical information. We also send out ad-hoc communications to members highlighting key presidential events and other important information.

## Social media

The Institution has a social media presence on LinkedIn, Facebook and Twitter which play a key role in promoting our activities and signposting our content. Key events, presentations and topical news stories are posted on all these feeds on a regular basis to help keep members informed and raise the profile of the Institution amongst the wider railway industry. LinkedIn remains our key social media network and this channel has seen a 24% increase in engagement in the last 12 months, boasting almost 8500 followers with all posts about our Siemens Mobility-sponsored "Return to Rail" conference receiving over 1000 clicks each. Our Twitter audience has grown by over 7.5% and link clicks on posts doubled indicating that the content we are posting is of great interest to users.

## Rail industry media

During this year we have developed our relationship with key railway media. Top quality editorial coverage for Ian Bridges' appointment as President, online IRSE events and our Professional Examination has been achieved in Modern Railways magazine, Rail Engineer, Rail Director and Rail Professional in addition to numerous mentions online in RailBusinessdaily and Railinsider.

## 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. Extensive work continues to edit and modernise the Metro Signalling Handbook which will be published in 2022.

## Library

Sadly, the IRSE Library which is housed in our London offices remained closed this year due to the pandemic. The building at Birdcage Walk which we share with several other professional engineering institutions has been closed with all staff continuing to work from home.



# Collaboration

The IRSE has both formal and informal working relationships with several 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. This is to be welcomed.

The inability to engage with senior leaders during the Covid-19 lockdown period has hampered a lot of the networking activity with the sector. It is expected that as the restrictions on face-to-face engagement are lifted, more work will be able to be done to increase engagement with key stakeholders.

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. We will watch with interest the development

of Great British Railways (GBR) and be ready to support and comment as details emerge.

This year we completed our term as chair of the Rail Engineers Forum (REF). This body is made up of representatives from all of the Professional Engineering Institutions who have a rail interest and includes IMechE, IET, ICE, PWI, CIRO, INCOSE, CILT, RCEA and the Young Railway Professionals. The chair, Andrew Simmons, will hand over to Andrew Skinner of GWR as the IMechE takes on the role of Chair. While in normal times REF would encompass conferences, seminars, lectures, training, information services, publications and statements of policy to government and other regulatory bodies, this year has mainly focused on maintaining links across the sector.

Regular meetings take place with the Railway Industry Association (RIA) to ensure that where possible the two bodies are working closer together to link professional employees working in professional businesses. This working relationship helps the IRSE and RIA to

identify where we can together make a difference in the rail sector.

Our relationship with the Royal Academy of Engineering and Engineering UK is helping us to gain better traction with activities focusing on encouraging young people into careers in science, technology, engineering, and mathematics as a career opportunity. We can gain a better focus by working with these bodies than if we used our own smaller resources.

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.

Our most recent collaboration is with the Women in Transport group as part of the drive to adjust the gender balance within the IRSE membership. Council member Harvinder Bhatia is now the portfolio holder for Equality, Diversity and Inclusion and will be looking to support the Institution in this ambition.

# Finances

The financial results are shown on pages 20 to 24. 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 tables refers to the two companies combined, and 'Charity' to the IRSE alone. As far as possible, these extracted results use the titles and the format of the consolidated accounts.

As is generally the case, the headline figure from the 2021 financial results is the Total Charity Funds in the first table on page 21. Despite Covid-19 and its global consequences, the Total Charity Funds have increased by £177,417. However, yet again this increase is entirely due to a significant increase in value of the investments, in the form of shares, shown in Note 1 on page 21. Our activities during the year made a loss

which is not unexpected. Due to the pandemic we were unable once again to hold our two major fundraising activities, the annual dinner and convention. As a result, IRSE Enterprises did not make a surplus to donate to the IRSE, although our highly successful online Return to Rail Conference sponsored by Siemens Mobility generated a small amount of welcome income we would not otherwise have had.

There are some significant variations in costs between 2020 and 2021. In 2020 the post of Licensing Registrar was vacant whilst in 2021 this position was filled and associated annual salary paid. Additional staff costs were carried during 2021 due to one member of staff sadly being absent due to ill health for a prolonged period of time. This follows on from 2020 when, to manage knowledge

transfer, we had people shadowing others. It has raised the question of whether we should intentionally budget for staff sickness. This is always a problem for a small organisation as it could result in an unnecessary significant increase in budgeted expenditure and a consequential increase in required income. The alternative, which we continue to apply, is to cover these costs from our reserves, certainly while we continue to have deficits in our operations.

Last year's report made reference to a need to address how to increase operational income so that we are not reliant on the stock market to show an increase in assets. Those discussions came to a conclusion towards the end of the year and details of the conclusions will be published shortly.

# Consolidated accounts (extract)

## THE INSTITUTION OF RAILWAY SIGNAL ENGINEERS CONSOLIDATED BALANCE SHEET AS AT 31st DECEMBER 2021

	Notes	Consolidated 2021 £	Consolidated 2020 £	Charity 2021 £	Charity 2020 £
<b>Fixed Assets</b>					
Tangible assets		4,180	19,558	3,186	10,395
Investments	1	2,206,609	2,055,844	1,613,264	1,488,776
<b>Total fixed assets</b>		<b>2,210,789</b>	<b>2,075,402</b>	<b>1,616,450</b>	<b>1,499,171</b>
<b>Current Assets</b>					
Stocks	3	58,091	48,862	55,456	42,416
Debtors	4	165,442	207,530	295,779	290,623
Investments	5	211,177	209,668	211,177	209,668
Cash at bank and in hand		362,093	238,466	119,347	69,062
<b>Total current assets</b>		<b>796,803</b>	<b>704,526</b>	<b>681,759</b>	<b>611,769</b>
<b>Creditors:</b>					
amounts falling due within one year	6	(463,923)	(422,469)	(274,140)	(228,440)
<b>Net current assets / (liabilities)</b>		<b>332,880</b>	<b>282,057</b>	<b>407,619</b>	<b>383,329</b>
<b>Total assets less current liabilities</b>		<b>2,543,669</b>	<b>2,357,459</b>	<b>2,024,069</b>	<b>1,882,500</b>
<b>Creditors:</b>					
amount falling due after more than one year	7	(246,490)	(237,697)	-	-
<b>Total net assets</b>		<b>2,297,179</b>	<b>2,119,762</b>	<b>2,024,069</b>	<b>1,882,500</b>
<b>Funds of the Charity</b>	2				
Unrestricted funds		2,260,019	2,083,971	1,986,909	1,846,709
Restricted funds		37,160	35,791	37,160	35,791
<b>Total charity funds</b>		<b>2,297,179</b>	<b>2,119,762</b>	<b>2,024,069</b>	<b>1,882,500</b>

## THE INSTITUTION OF RAILWAY SIGNAL ENGINEERS CONSOLIDATED CASH FLOW STATEMENT AS AT 31st DECEMBER 2021

	2021 £	2020 £
Net cash (used in) operating activities	(32,284)	(124,790)
Cash flow from investing activities:		
Purchase of tangible fixed assets	(2,220)	(5,784)
Purchase of fixed asset investments	(150,500)	(237,983)
Sale of fixed asset investments	273,112	237,082
Interest received	4,060	1,825
Dividends received	31,459	29,928
Net cash provided by / (used in) investing activities	155,911	25,068
Change in cash and cash equivalents in the year	123,627	(99,722)
Cash and cash equivalents at start of year	238,486	338,188
Cash and cash equivalents at end of year	362,093	238,466

**THE INSTITUTION OF RAILWAY SIGNAL ENGINEERS**  
**CONSOLIDATED STATEMENT OF FINANCIAL ACTIVITIES AND INCOME AND EXPENDITURE**  
**ACCOUNT FOR THE YEAR ENDED 31st DECEMBER 2021**

	Notes	Unrestricted £	Restricted £	Total 2021 £	Total 2020 £
<b>Income and Endowments from:</b>					
Charitable activities:					
Donations and legacies	9	8,901	-	8,901	19,092
Other trading activities:					
Non-ancillary trading income	10	346,358	-	346,358	354,592
Other activities	10	528,073	-	528,073	480,916
Investments:					
Investment income	11	34,783	736	35,519	31,753
<b>Total Income</b>		<b>918,115</b>	<b>736</b>	<b>918,851</b>	<b>886,353</b>
<b>Expenditure on:</b>					
Raising Funds	12				
Other activities		6,070	-	6,070	3,857
Investment		9,208	-	9,208	8,008
Non-ancillary trading		403,600	-	403,600	422,322
		418,878	-	418,878	434,187
Charitable activities	12				
Awards		18,726	300	19,026	16,195
Promoting best practice		561,636	-	561,636	481,557
		580,362	300	580,662	497,752
<b>Total Expenditure</b>		<b>999,240</b>	<b>300</b>	<b>999,540</b>	<b>931,939</b>
<b>Net Expenditure before (loss) / gain in investments</b>		<b>(81,125)</b>	<b>436</b>	<b>(80,689)</b>	<b>(45,586)</b>
Net (loss) / gain on investments		257,173	933	258,106	232,336
<b>Net Income / (Expenditure)</b>		<b>176,048</b>	<b>1,369</b>	<b>177,417</b>	<b>186,750</b>
<b>Reconciliation of funds</b>					
<b>Total funds brought forward</b>		<b>2,083,971</b>	<b>35,791</b>	<b>2,119,762</b>	<b>1,933,012</b>
<b>Total Funds Carried Forward</b>		<b>2,260,019</b>	<b>37,160</b>	<b>2,297,179</b>	<b>2,119,762</b>

**ANNUAL MEMBERS' REPORT WITH SUPPLEMENTARY MATERIAL**

The tables set out on pages 20 to 24 are extracted from the full audited accounts of the Institution for the year ended 31 December 2021. 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, UK.
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.

**A P Smith**  
Treasurer

Approved by the Trustees on 10 March 2022.

**IR Bridges**  
President  
Director and Trustee

**A Knight**  
Vice-President  
Director and Trustee

**THE INSTITUTION OF RAILWAY SIGNAL ENGINEERS**  
**NOTES TO THE CONSOLIDATED ACCOUNTS**  
**FOR THE YEAR ENDED 31<sup>st</sup> DECEMBER 2021**

**1 Fixed Asset Investments (Group)**

	Equities £	Government Securities £	Total £
Market value			
At 1 January 2021	1,862,373	193,471	2,055,844
Additions	131,280	19,220	150,500
Disposals	(260,492)	(12,620)	(273,112)
Revaluations	267,804	5,573	273,377
At 31 December 2021	2,000,965	205,644	2,206,609

**2 Movement in Funds (Group)**

	At 1.1.21 £	Net movement in funds £	At 31.12.21 £
<b>Designated funds</b>			
Scholarship Fund	78,068	247	78,315
Alan Fisher / Frank Hewlett Fund	425,321	4,967	430,288
General Development	307,000	-	307,000
Future ASPECT Conference	10,000	-	10,000
International Convention	27,500	-	27,500
Textbook Preparation	7,500	-	7,500
General Fund - Unrestricted fund	974,813	134,987	1,109,800
IRSE Enterprises - Non-charitable trading fund	253,769	35,847	289,616
	2,083,971	176,048	2,260,019
<b>Restricted funds</b>			
Dell Bequest	23,127	937	24,064
Thorrowgood Bequest	12,664	432	13,096
<b>TOTAL FUNDS</b>	<b>35,791</b>	<b>1,369</b>	<b>37,160</b>

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	282,100	40,424

<b>3 Stock</b>	Consolidated 2021 £	Consolidated 2020 £	Charity 2021 £	Charity 2020 £
Stock	58,091	48,862	55,456	42,416

<b>4 Debtors</b>		£		£
Trade debtors	67,078	122,910	-	-
Other debtors	4,964	12,017	4,964	12,017
Pre-payments and accrued income	16,529	6,422	-	-
VAT	76,871	66,181	63,292	53,571
Amounts owed by group undertakings	-	-	227,523	225,035
	165,442	207,530	295,779	290,623

<b>5 Current Asset Investments</b>		£		£
National Savings	211,177	209,668	211,177	209,668
	211,177	209,668	211,177	209,668

<b>6 Creditors: amounts falling due within one year</b>		£		£
Trade creditors	53,457	28,984	45,749	18,093
Accruals	21,547	43,870	17,008	20,558
Deferred income	385,197	345,680	206,682	187,803
Other creditors	6,722	3,935	4,701	1,986
	463,923	422,469	274,140	228,440

7	Creditors: amounts falling due after one year	Consolidated 2021 £	Consolidated 2020 £	Charity 2021 £	Charity 2020 £
	Other creditors	246,490	237,697	-	-

Representing the proportion of licence fees received which will be credited to Income after more than one year.

8	Activities of IRSE Enterprises	2021 £	2020 £
	<u>Turnover</u>		
	Donations	-	4
	Proceeds - Conventions and Conferences	-	784
	Proceeds - Dinners	-	-
	Proceeds - Technical visits and Seminars	22,332	13,008
	Licensing - Licence fees received	200,048	205,404
	Licensing - Audit fees	5,761	45,042
	Licensing - Assessing agents fees	106,887	82,306
	Licensing - Technical publications	11,330	8,044
		<b>346,358</b>	<b>354,592</b>
	<u>Cost of sales</u>		
	Costs - Conventions and Conferences	(1)	1,812
	Costs - Dinners	-	(2,653)
	Costs - Technical visits and Seminars	18,556	13,929
	Costs - Young members' Seminars and Visits	-	-
	Licensing - Logbooks opening stock	6,444	9,034
	Licensing - Engineer's fees	14,503	14,503
	Licensing - IRSE administration charges	219,980	162,753
	Licensing - Audit engineers	44,959	48,195
	Licensing - Accreditation	12,014	5,385
	Licensing - Logbooks closing stock	(2,635)	(6,444)
		<b>313,820</b>	<b>246,514</b>
	Gross profit	<b>32,538</b>	<b>108,078</b>
	<u>Other income</u>		
	Dividends receivable	7,266	6,105
	Bank interest receivable	7	119
		<b>7,273</b>	<b>6,224</b>
		<b>39,811</b>	<b>114,302</b>
	<u>Expenditure</u>		
	IRSE Admin charges	22,879	48,561
	Telephone	8,122	6,322
	Post and stationery	2,880	2,447
	Officers' expenses	-	-
	Accommodation and refreshments	105	675
	Computer costs	7,580	33,598
	Professional indemnity insurance	3,099	2,910
	Licensing - Treasurer's, Chief Executive's and Registrar's Fees	36,782	73,201
	Logbook purchases	-	-
	Investment Manager's fees	4,042	3,694
	Auditor's remuneration	2,000	2,000
	Exchange rate variance	-	(2)
		<b>87,489</b>	<b>173,406</b>
	<u>Finance costs</u>		
	Licensing - Bank charges	2,291	2,402
		<b>(49,969)</b>	<b>(61,506)</b>
	<u>Gain / Loss on revaluation of assets</u>		
	Gain on revaluation of investments	85,816	111,066
		<b>35,847</b>	<b>49,560</b>



<b>9</b>	<b>Donations and Legacies (Group)</b>				<b>2021</b>	<b>2020</b>
					£	£
	Donations				8,901	19,092
<b>10</b>	<b>Other Trading Activities (Group)</b>				£	£
	Subscriptions				451,423	407,702
	Professional reviews				7,710	3,350
	Advertising				13,513	12,555
	Booklets and text books				8,943	18,730
	IRSE ties, badges & cufflinks				64	26
	Examination fees and materials				44,920	38,553
	Proceeds from members' lunch				1,500	-
	Consultancy income				-	-
	IRSE Income				528,073	480,916
	Trading income:					
	Turnover of trading subsidiary - Note 8				346,358	354,592
<b>11</b>	<b>Investment Income (Group)</b>					
	Equities and government stocks				24,193	23,824
	Interest receivable				4,053	1,705
	IRSE Enterprises Ltd				7,273	6,224
					35,519	31,753
<b>12</b>	<b>Analysis of Expenditure</b>	<b>Staff Costs</b>	<b>Depreciation</b>	<b>Other</b>	<b>2021</b>	<b>2020</b>
		£	£	£	£	£
	Raising funds					
	Other activities	2,131	94	3,845	6,070	3,857
	Investment	-	-	9,208	9,208	8,008
	Non-ancillary trading	189,114	8,170	206,316	403,600	422,322
	Total raising funds	191,245	8,264	219,369	418,878	434,187
	Charitable activities					
	Awards	8,521	377	10,128	19,026	16,195
	Promoting best practice	202,372	8,958	350,306	561,636	481,557
	Total charitable activities	210,893	9,335	360,434	580,662	497,752
	Total expenditure	402,138	17,599	579,803	999,540	931,939
<b>13</b>	<b>IRSE Charitable Expenditure</b>				£	£
	Raising donations and legacies					
	Fund raising dinners				1,388	-
	Consultancy				-	-
	Charitable activities					
	Proceeding: editing and printing				4,511	4,028
	Newsletter: editing and printing				101,777	98,249
	Booklets and textbooks				3,766	5,628
	IRSE ties, cufflinks and badges				-	-
	Prizes				25	39
	Awards				300	767
	Activities funded by country subscription supplements				7,641	5,974
	Professional review costs				(820)	1,203
	Support costs					
	Staff costs				215,802	151,739
	Office rent and services				18,524	18,524
	Fees and honoraria				89,488	74,017
	Membership database				-	-
	Other administrative costs				130,900	128,160
	Investment manager's fees				9,208	8,008
	Fixtures and fittings				9,429	9,282
	Governance costs					
	Auditor's remuneration				4,000	4,000
	Total expenditure				595,939	509,618