As we come to the end of the first quarter of the new financial year, we asked INCOSE UK President Ian Gibson to reflect on the year ahead and the future of INCOSE UK and the challenges it faces in the future.

May is often a time for reflection. For those of us with a high proportion of government-funded tasks to work on it usually represents a transition from closing out the last financial year and moving on to some different opportunities. In 2021, the ever-present backdrop of COVID-19 restrictions is starting to lift, bringing opportunities both new and old – who would have thought that going into an office to have a face-to-face meeting would be elevated from the mundane to the exotic, simply because for many of us that hasn't been an option for over a year? One of the more interesting observations coming out of our regular engagements with other Professional Engineering Institutions is that many of them expect to see some profound shifts in how business is conducted from now on.

For many people, the ability to attend multiple meetings with geographically dispersed attendees throughout the same day has become normalised. The thought of driving for 2 hours each way just to sit in someone else's room-without-a-view for a meeting seems a little bizarre if it could be done just as effectively through remote means. There is a big "if" there – remote meetings need a different skill set from relying on reading body language or busking in front of a whiteboard, as we have probably all been learning. However, it is easy to imagine a working environment where remote working becomes the norm, remote meetings the default choice, and physical presence in an office becoming much more targeted.

Of course, as a community that likes to “think in systems”, there is always going to be a concern that whilst a seasoned Systems Engineering practitioner may well thrive on a diet of remote working and occasional office presence, those who operate more at a "supervised practitioner" level are potentially not receiving the supervision that they need to bring the best out of them. Important feedback loops and reinforcing cycles may be jeopardised by the move towards distributed working where you can’t
Just lean over someone’s shoulder for a quick chat, or grab a coffee and a whiteboard for 10 minutes. Likewise, it’s more difficult to create the spontaneous learning that emerges from serendipitous encounters on the floor plate.

This may be one of the biggest challenges of 2021 and beyond. How do you impart the pragmatic lessons of Systems Engineering practice to new graduates who have barely even set foot in an office, let alone been allowed to go and see real equipment? It won’t be straightforward for anyone involved, but there must be ways in which training, education and sensible career development can play their parts in putting in place an effective system to generate effective Systems Engineers. As the UK’s only professional engineering institute for Systems Engineering we can, and should be making a contribution.

May saw the successful launch of the first ever Endorsed Training Provider training event. This long-awaited event marks our return to offering dedicated training events, but using a set of providers who have been through a rigorous process to ensure that they have the appropriate skills, experience and capability to deliver courses on the particular topics covered by their endorsements. The Endorsed Training Provider scheme is set to expand the range of providers over the coming months and is even attracting interest in wider INCOSE circles. Under the current restrictions it will be a virtual event, but we hope to be able to offer physical events in the future.

For those who prefer to learn at their own pace, there is an ever expanding range of books in our “Don’t Panic” series, with more titles in the pipeline, and also our “Advanced Applications in Systems Engineering” series which so far has one title covering how to implement MBSE into organisations. If you want to know more about these titles, look out for the “Meet the Author” zoom sessions over the next few months where you can find out more and ask any burning questions.

As part of our wider engagement with the Royal Academy of Engineering, we are in the progress of adopting their Diversity and Inclusion Progression Framework, and have also implemented a recommendation from our most recent Engineering Council review to ensure that we have a Equality, Diversity and Inclusion policy which is owned by a specific Director on the Council, in this case the Outreach Director. This is about more than just policies, metrics and targets. It’s about ensuring that INCOSE UK is a welcoming environment where all feel able to engage, share and prosper. Systems Engineers pride themselves on considering multiple stakeholder perspectives to come up with better solutions, and it should be a natural extension to consider how diverse teams with different perspectives can add to the depth and quality of the work.

Shifting slightly to the theme of professional development, I would like to end by highlighting the excellent work of all of the volunteers involved in delivering our route to professional registration. It has been a pleasure to see the pool of assessors and professional registration advisors grow as the demand signal from applicants increases, and to see rapid process improvement as we get to grips with the finer points of how to deliver a professional service for professional registration. Similarly, it is hugely gratifying to see the Joint Review Board governance structure working so well with the Institute of Explosives Engineers, and a great example of how whilst we defer to them on the art of blowing things up, and they defer to us on the art of integrating things together, we can both use the same UK-SPEC standard to assess engineering competence regardless of how diverse the comparison is between different candidates’ prior experiences.

This edition of ePreview is themed around training, education and career development. I hope that everyone finds something of interest within the pages that follow. Read on… you might learn something new…

Ian Gibson
INCOSE UK President

Jessica Leigh Jones MBE will be giving this year’s McPherson Memorial Lecture on day one of ASEC2021.

Jessica Leigh Jones MBE is a multi-award-winning Engineer and Astrophysicist. She is Co-Founder and Chief Executive of iungo, a CareerTech start-up democratising access to excellent careers for everyone. She is also a Royal Academy of Engineering Visiting Professor and a Royal Society Entrepreneur in Residence at the University of Wales Trinity St David. Here, she is leading the flagship Enterprise Engineers Programme for engineering undergraduate students and apprentices.

Graduating from Cardiff University with an honours degree in Astrophysics in 2013 Jessica is a Chartered Quality Professional (CQP MCQI). She is a Non-Executive Director of Institute for Apprenticeships and Technical Education (HATe) and Vice Chair of Wales’ largest exam board, WJEC. Jessica received an MBE for services to women in engineering in Wales in the 2020 Queen’s Birthday Honours. She has received the Freedom of the City of London and represents the fastest progression to the rank of Liverman at the Worshipful Company of Scientific Instrument Makers. She was 2017’s Woman of the Future for Technology & Digital, featured in the 2020 Who’s Who list of influential British people and appeared as one of the youngest in the Forbes 30 under 30 Europe List 2018.

The McPherson Lecture

Presented in memory of Philip McPherson who was a practitioner, educator and intellectual leader in Systems Engineering for over 45 years and an early and inspirational member of INCOSE UK.

At City University in London, he set up the Department of Systems Science in 1972 – probably the first “Systems Professor” in Europe.

His knowledge, passion and tenacity led the department into a position of intellectual leadership in applying systems thinking.

ASEC Sponsorship is a great way to get involved with INCOSE UK’s flagship event whilst also gaining brand exposure and interacting with Systems Engineering leading professionals from across industry, government and academia.

Click here for more information on becoming an ASEC 2021 Sponsor
FINDING YOUR WAY THROUGH EARLY CAREERS

Amelia Jephson, Early Careers Forum Chair provides an overview of the resources available to early careers systems engineers and how the Early Careers Forum (ECF) is there to help.

The landscape of Professional Development for early careers systems engineers is a complicated one. Systems Engineering has been traditionally thought of as a career that experienced engineers enter after honing their craft over many years, however this is changing.

Independent of study or experience, entry into Systems Engineering careers can be unclear, with the interpretation of System Engineering roles varying from industry, consultancy, and business analysis to sub-system design, testing and evaluation.

This means that many engineers have no formal SE training; and tend to learn ‘on-the-job’ including from colleagues. This is where in the UK, the INCOSE UK Early Careers Forum (ECF) supports with the goal of providing a welcoming learning community for those new to SE, whether they be starting out in their working life or having a career change. This article provides an overview of the resources available to early careers systems engineers and how the ECF is there to help!

Education and Professional Registration

One key-way of upskilling is training – which can be a complex environment. There are a small number of undergraduate courses, although most engineering courses teach Systems Engineering principles to some extent. There is an increasing number of MSc and postgraduate courses that can be studied full or part time, as well as Systems Engineering apprenticeships being a fantastic way to develop through both technical and experiential learning (Systems Engineer (degree) / Institute for Apprenticeships and Technical Education).

There are shorter-term ways to gain knowledge of a technical nature. INCOSE UK have recently launched the Endorsed Training Provider scheme; training providers that are recognised for offering courses in Systems Engineering best practice (Endorsed Training Provider Scheme).

Certification through INCOSE is also a useful route to having recognised systems engineering qualifications (Becoming Certified - INCOSE UK). For early careers engineers, studying for the ASEP exam provides a brilliant introduction on the SE Handbook, getting to grips with the theoretical side of the industry.

INCOSE UK also provides professional registration - a great way to demonstrate the skills and experience you have that is recognised across all engineering disciplines in the UK (Professional Registration-INCOSE UK).

Making connections, learning, and developing in topics across Systems Engineering is such an important part of progressing your career, helping to inform career choices, and share ideas with peers which you may have otherwise not had any interaction with. However, this can be difficult to do - especially in the year that we have had! The ECF works alongside the rest of the member groups of INCOSE UK, as well as globally, to put on events, workshops and networking opportunities which allow knowledge and experience to be shared.

One example is our upcoming event with the INCOSE UK Energy Systems Interest Group – we are facilitating a workshop around the Sustainability Guidance for Engineers. Not only does the interest group benefit from a relevant and useful session at their meeting; they get the fresh insight of early careers systems engineers who will be bringing a new perspective. On top of that, connections will be made across industries and generations!

Looking ahead, the ECF wants to provide more opportunities for members to make connections through networking-focused events and mentoring, as well as supporting the Outreach Director in engaging with universities.

Summary

From the perspective of the ECF, developing your Systems Engineering career takes a multi-pronged approach of education and wider professional development. The ECF is a group run-by and for, early careers systems engineers. We seek to create a community of learning, knowledge, and networking, across industries and generations, to enhance the whole of the SE community.

You don’t need to be under a certain age or fresh out of school or university to be part of the community, we recognise that Systems Engineering is often a second career – we welcome everyone who may be new to the industry!

Want to be involved or find out more? We have some great roles on the committee coming up and regularly send updates on our group email list.

Find us on the INCOSE UK website [ECF] where you can sign up to the group as a member or non-member, email ecf-chair@incoseuk.org or find the committee on LinkedIn!
INCOSE UK Elections

The role of Outreach Director is coming up for election later in the year. More information about the election process can be found here.

If you have ever considered sitting on the INCOSE UK Council, we present an overview of the Outreach Directors position and some of the required skills needed to perform the role.

The full Terms of Reference can be read here.

Information on timelines will be released at a later date.

Overview of the Position

The INCOSE UK Outreach Director is responsible for the development and direction of a comprehensive portfolio to coordinate INCOSE UK’s outreach across UK Systems Engineering application domain boundaries including Government, Industry and Academia.

He or she leads the definition and execution of an outreach strategy aligned with and enabling INCOSE UK’s objectives, particularly to achieve improved impact beyond our current bases. This includes the identification and definition of outreach strategies and initiatives; coordination with other INCOSE UK Directors and INCOSE international community on the execution of outreach campaigns; the identification, facilitation, and management of alliances; and the establishment and leadership of an appropriate supporting volunteer structure.

The Director for Outreach is responsible for helping INCOSE UK connect to the UK engineering community where systems thinking and practice is needed or practiced differently. The outreach should be open and bi-directional, bridging those communities through a mutual appreciation of and advocacy for systems objectives, perspectives, deployable work products, events and terminology.

The Outreach Director is an elected, position with a three-year term of office and is a voting member of the INCOSE UK Council.

Required Skills

- Strong oral and written communication skills
- Ability to communicate effectively across international and cultural boundaries
- Ability to understand business principles and usage patterns, translate and communicate effectively across application domain boundaries
- Confidence and capability to promote the values and mission of INCOSE UK
- Connection, collaboration, and negotiation skills to establish and facilitate alliances
- Leadership and teamwork skills to coordinate activities within a volunteer organisation, and identify suitable candidates to promote INCOSE UK Outreach
- Budgeting and planning skills including the ability to write and implement strategic and operations plans
- Participates in all INCOSE UK Council meetings

Endorsed Training Provider Scheme

SyntheSys Becomes an Endorsed Training Provider

INCOSE UK are pleased to announce that SyntheSys Technologies has become the 3rd company to successfully go through the assessment process and become an INCOSE UK Endorsed Training Provider.

The scheme allows organisations who provide professional Systems Engineering-related training courses to apply and be assessed in order to achieve the status of ‘INCOSE UK Endorsed Training Provider’.

The endorsement for SyntheSys (when delivered by Mark Williamson) extends to the following Standard Courses:

- Systems Engineering Foundation
- INCOSE Systems Engineering Professional Training Course: Prepare to Pass the SEP Examination
- Requirements Writing

The endorsement also extends to Bespoke Courses

As we enter a new phase of COVID-19 restrictions, we are delighted to confirm our revised 2021 classroom training schedule.

Systems Engineering Foundation Training:
Learn the Principles and Practices of Systems Engineering.
20-21 May | 21-22 September | 07-08 December

INCOSE Systems Engineering Professional (SEP) Examination Preparation:
Prepare to pass the SEP exam.
24-28 May | 13-17 September | 13-17 December

Requirements Writing Training:
Learn the necessary techniques for the creation of clear, concise and correct requirements.
Dates on request or can be bolted on to other courses.

We take a flexible approach to our training delivery. Courses can be tailored to your specific requirements and delivered at a date and venue of your choice in many cases. Selected courses can be delivered as virtual, online courses.

For further course and booking information or to discuss your training requirements contact: cet@synthesys.co.uk

SYSTEMS ENGINEERING TRAINING BACK ON THE AGENDA
REMAINING DATES FOR 2021
**Endorsed Training Provider Scheme**

**Endorsed Training Provider Event**

The Endorsed Training Provider scheme allows organisations who provide professional Systems Engineering related training courses to apply and be assessed in order to obtain the status of “INCOSE UK Endorsed Training Provider”. Successful applicants will be able to use this term, and an associated logo on publicity and marketing material.

INCOSE UK is excited to have completed the first Endorsed Training Provider course in conjunction with one of our Endorsed Training Providers Scarecrow Consultants Ltd. The event was held with delegates from a number of different organisations and proved how successful training can be in an online environment. There is a maximum of 15 delegates per INCOSE UK Endorsed Training Provider course, ensuring that each attendee has the opportunity to engage with the trainers and their fellow delegates as if in a face to face environment.

Our next event is being held on 15th-17th June 2021, with courses being run by Burge Hughes Walsh Ltd and Scarecrow Consultants Ltd. Further information on each course and online booking can be accessed by going to ETP Schedule - INCOSE UK.

Should you have any questions please contact techserv@incoseuk.org

**I’m A Systems Engineer - Emma Sparks**

We asked Emma to contribute to our “I’m a Systems Engineer and I do” feature.

Emma started her career as a graduate research scientist working within defence and was given the opportunity to extend her training with an option of Systems Engineering being promoted as the right way to go. Initially unconvinced, Emma discovered she has a passion for Systems Engineering and says it “finally gave me the foundations to go. Initially unconvinced, Emma discovered she has a passion for Systems Engineering and says it "finally gave me the foundations to channel it into something more than the sum of the parts".

The full feature is available to read on the INCOSE UK website.

**Professional Development**

**Online Sessions**

In order to provide information and guidance, we have set up a series of interactive Professional Development Zoom sessions. These sessions are open to all and there is no requirement to be a member in order to attend. The following sessions are available to book.

**14 July 2021 - SEP Certification Clinic**

Attend this session to gain a better understanding of INCOSE UK SEP Certification. The session will be an open forum for discussion and will cover an overview of the requirements to apply for each level and details of the application process. Input from a recent candidate and a Certification Application Reviewer will be included along with a Q&A.

**15 September 2021 - Interview Preparation Clinic**

A session exploring the professional registration interview. Find out what is involved and the best way to prepare for this. An open forum session with input from our assessor team and the INCOSE UK assessment team.

**Revised UK-SPEC fourth edition**

For those INCOSE UK members who are working toward professional registration, the revised fourth edition of UK-SPEC was published on 31 August 2020 with the intention that it will be fully implemented by 31 December 2021.

The UK Standard for Professional Engineering Competence (UK-SPEC) sets out the competence and commitment required for registration as an Engineering Technician (EngTech), Incorporated Engineer (IEng) or Chartered Engineer (CEng). It also includes examples of activities that demonstrate the required competence and commitment.

INCOSE UK will also republish their guidance for systems engineers in mapping their experience to the competences laid out in the UKSPEC. This will be available later in 2021.

**To book a place for you or a colleague, please send us an email.**
Professional Registration

Call for Professional Registration Advisors and Assessors

INCOSE UK are seeking experienced members who hold professional registration to become involved in the professional registration programme.

Our licensed status and online sessions are attracting lots of interest from existing and future members who require support with their applications. This ranges from those who are early in their journey and don’t know where to begin, to an applicant requiring a final review prior to submission – and everything in between.

Perhaps you already operate as an advisor in your workplace or undertake an assessor role for another institute? If you would like to support INCOSE UK in one of these volunteer roles, please contact us on profdev@incoseuk.org for more details.

What’s in it for you?

Give Back

Obtain personal satisfaction by making a difference in the career development of next generation of INCOSE UK registrants. Give back to the industry and the institutions that helped you gain your expertise and reach success. Mentoring is an empowering experience that impacts both mentors and mentees and contributes to both their development.

Expand your own professional network

The opportunity to work with and support members from diverse backgrounds and with a wide range of talents. Broaden your network and gain a fresh new perspective.

Develop your own continuing professional development (CPD)

This role provides scope to further develop and become involved in the professional registration assessment and interviewing teams on behalf of INCOSE UK. An excellent opportunity for development which contributes to your own CPD.

Certification

The Certification Examination

The knowledge-based Systems Engineering Professional examination is the cornerstone of both the ASEP and CSEP Systems Engineering accreditations. It is accessible to systems engineers at all stages of their career and provides an excellent opportunity for individuals and organisation to benchmark Systems Engineering skills.

The examination is based in its entirety on the INCOSE Systems Engineering Handbook. The descriptions in the 287-page handbook describe the key process activities performed by systems engineers and other engineering professionals throughout the life cycle of a system. The book covers a wide range of systems concepts that broaden the mind of the Systems Engineering professional such as, systems thinking, systems science, life cycle management, speciality engineering, systems of systems and agile and iterative methods.

When you are ready to book an examination, you can start the process to apply for ASEP or CSEP.

Following submission and payment of the application fee for ASEP or CSEP via the INCOSE UK website, applicants will be forwarded a unique link to enable them to book the examination directly with Examity, our online exam provider. The certification examination carries an additional fee which is paid directly to the exam provider by the candidate. Details of this cost can be found here. Candidates have a period of one year to sit and pass the exam in up to three attempts.

The exam contains 100 scored questions. It may have 0, 20, or 50 additional questions that do not count toward the candidate’s score. These are beta questions, which are being evaluated for the future. The exam duration is 1 minute per question, including both scored and unscored questions. A 120-question exam is standard, and lasts 120 minutes. Special accommodations are available and include additional time.

All questions are formatted as multiple-choice, and some have multiple answers. Details on this approach are provided in this paper and twenty sample questions are posted here.

The exam can be conducted from a location of your choice, with your own computer and the candidate receives an immediate pass/fail results displayed on screen. During the exam the provider uses live, remote and video proctoring.

For more information on the Certification examination contact profdev@incoseuk.org.

How to Book an Exam

When you are ready to book an examination, you can start the process to apply for ASEP or CSEP.
Certification

Systems Engineering Professional Certification

If you are planning to apply for ASEP or CSEP please be aware of the following update on examinations. The INCOSE Certification Program has changed its testing provider on 1 April 2021. Going forward we will no longer be testing at Prometric computer test centres. Instead, we will be offering online testing, which you can do from a location of your choice, with your own computer. We will be using live, remote, video proctoring. The candidate testing experience will remain very similar, with 120 multiple-choice questions and immediate pass/fail results displayed on screen.

Please note:

- From the 1 March all exam candidates will take the exam using this new method.
- All candidates with exam eligibility beyond 31 March may access the new online scheduling system from the beginning of March, and may take exams online starting 1 April.

All affected existing INCOSE UK candidates will receive an email with further information on the process going forward. If this affects you and you have not received an email, or have any questions please contact profdev@incoseuk.org.

We would like to send congratulations to the following who have attained ASEP, CSEP and ESEP since the last ePreview. Members listed have given their consent to be published.

- Jordan Mitchell
- Andrew Stoker
- Joseph Hughes
- Manu Marigowda
- Jayaramgowda
- Peter Moore
- Mike Mania
- Edward Stamp
- Tong Zhu
- Andrew Stoker
- Morua
- Mike Wilkinson
- Tim Rabbets
- Mike Moore
- Peter Towers
- James Towers
- Aurelijus Morkevicius
- Morkevicius
- Aurelijus

INCOSE UK Publications

Meet the Author - Upcoming Dates

25th June 2021
Mike Wilkinson and Tim Rabbets will be discussing their book, Don’t Panic! The Absolute Beginner's Guide to Architecture and Architecting.

9th July 2021

Booking available via the INCOSE UK events page, click through the More Info button on the event you would like to attend to book.

Meet the Author - Don’t Panic! The Absolute Beginner’s Guide to Managing Interfaces

The Meet the Author event talking to Paul Davies about his Don’t Panic! The Absolute Beginner’s Guide to Architecture Frameworks took place on the 9 April 2021.

Paul spoke about his objectives for writing the book, how the book evolved from a workshop session, to a tutorial and eventually into a manuscript for the Don’t Panic! series of books. He also spoke about the challenges he faced when writing the book, and provided some useful tips as to what to think about when submitting your own Don’t Panic! manuscripts.

This is a great opportunity to learn from the authors and ask questions about the content of their book, their inspiration for writing it and their experience of Architecture Frameworks.

This session takes place on Friday 28th May 2021 14:00-15:00 GMT.

If you would like to attend, please email events@incoseuk.org.


**INCOSE UK Publications**

### Don't Panic! Review

Peter Douglas has worked at Rolls-Royce for over 13 years, undertaking various roles within the Control System and Equipment Health Monitoring areas of the business across the Energy, Naval Marine and Defence Aerospace sectors. He is currently a Systems Architect within the System Design Integration area of the business. Peter provides a review of the Don’t Panic! The Absolute Beginner’s Guide To Architecture Frameworks.

The Absolute Beginner’s Guide to Architecture Frameworks is the latest addition to the Don’t Panic series of books. The books in these series give a good introductory overview into topics in a quick and easy to read format (most can be read in less than an hour). This book follows the format and introduces system architecture and the key concepts of architectural frameworks before detailing some of the most common frameworks and how these have evolved. The book provides a wealth of further reading resources for those wishing to read further in this area. As a System Architect this book, along with others in the series, provides an accessible means of accessing concepts before delving into more detailed background reading in these areas. I expect this book, along with others, to be my quick go to source of information for the years to come.

### Abstract Requests for New Book series

Building on the success of the Don’t Panic line of books, Advanced Applications in Systems Engineering is a new series of in-depth books that will focus on single applications of Systems Engineering. The first book in the series, “Implementing MBSE into Your Business - The Trinity Approach”, is available to purchase from the INCOSE UK online store.

The publishing team are looking to publish more books in this series, so if you have an idea for a publication that you feel would fit into this series, please send a brief abstract of your idea to publications@incoseuk.org.

Manuscripts for the Advanced Applications in Systems Engineering are to be between 200 to 300 pages in length

We look forward to reading your ideas.

### Other titles from INCOSE UK

Alongside the Don’t Panic! And Advanced Applications in Systems Engineering line of books, there are also a large selection of other publications including Think Engineer.

Think Engineer is a children’s book that is designed to promote STEM (Science, Technology, Engineering and Mathematics) and in particular engineering to school children. The book is aimed at Key Stage 2 pupils (ages 7 - 11), and their parents and teachers to raise awareness of engineering.

This, and other publications, are available from the INCOSE UK website.

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**INCOSE UK is a Professional Engineering Institute (PEI) focused on Systems Engineering.**

With over 1,000 members coming from diverse backgrounds covering purchasers, system developers and academics and representatives including aerospace, automotive, defence, transportation, communication and telecommunications, INCOSE UK is the best place to get your message across.

Please contact advertise@incoseuk.org for more information.