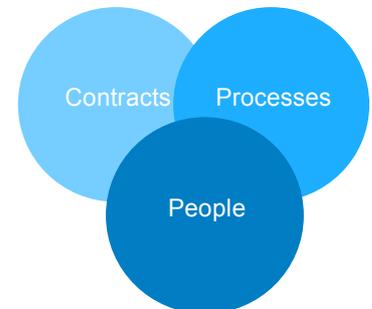


Three questions at the heart of rail systems engineering

This is an exciting time for systems engineering in rail as a wave of realisation spreads across the industry that effective systems engineering is just as essential to delivering the railway that society demands as the traditional engineering disciplines are. The Rail Interest Group (RIG) is proud to support the rail industry in learning how best to apply systems engineering by providing a forum for the exchange of experience and good practice.

After a successful series of evening presentations, the RIG is now organising a day-long workshop to explore in more detail three difficult questions that rail organisations face in increasing their take-up of systems engineering:

- How should we apply systems engineering principles in the rail environment?
- How should we write systems engineering into contracts?
- How do we find enough rail systems people?



The workshop will adopt the format used with such success to date – short presentations by practitioners active in the field describing real, current activities with balanced reflections on their effectiveness. The day-long duration will allow participants to listen to several perspectives on each question and then discuss whether an answer is emerging.

There will be an opportunity for participants to talk informally over drinks after the workshop.

The venue for the Workshop will be London Underground, 55 Broadway, London SW1H 0BD

London Underground has kindly agreed to host the event in their top-floor function suite in the heart of Westminster. The function suite is attached to a terrace with views over central London. The RIG is grateful to London Underground for its support.

Pricing and registration

The registration fee for the event will be £90 for INCOSE members and £100 for non-members. The fee includes lunch and refreshments. Registrants can also purchase a ticket for a barbecue meal at the networking event after the workshop for £15. All prices include VAT.

The event registration will be managed for INCOSE UK by Dot The Eye Ltd. To register for the event visit our online registration facility at www.incoseonline.org.uk. Here you can register for the event and pay by card through a secure payment facility with Lloyds TSB Cardnet via Protx.

Registration opens on **1st June 2009**. We expect the event to sell out – **please book early in June**.

If you are unable to take advantage of our on-line registration facilities please contact Dot The Eye Ltd by email at enquiries@incoseonline.org.uk, by telephone on +44 (0)1460 298217 or fax on +44 (0)845 280 5304. If you have any other questions, please contact the RIG Chair, Bruce Elliott, at bruce.elliott@arbutus-tc.co.uk or on +44 (0)7970 694043.

The International Council of Systems Engineering (INCOSE) is a not-for-profit membership organisation founded to develop and disseminate the interdisciplinary principles and practices that enable the realisation of successful systems. INCOSE has grown significantly since its formation in 1990. Today, there are over six thousand members representing a broad spectrum – from student to senior practitioner, from technical engineer to program and corporate management, from science and engineering to business development. Members work together to advance their technical knowledge, exchange ideas with colleagues, and collaborate to advance Systems Engineering

The INCOSE UK Rail Interest Group has been formed:

- *To provide a forum for those interested in Systems Engineering in rail to network in a less formal environment, to exchange good practice and to provide mutual support in an area which can require some sustained perseverance;*
- *To promote, improve and share the practice of Systems Engineering within the rail industry;*
- *To foster connections with other professional bodies within rail and thereby promote cross fertilisation of knowledge and experience across sectors and community disciplines; and*
- *To promote awareness of INCOSE UK and encourage membership within the rail industry.*

Programme

There will be breaks and further opportunities for networking throughout the day.

0845H	Registration and coffee	
0930H	Opening remarks	
Theme 1: How should we apply systems engineering principles in the rail environment?		
0940H	Rail Systems Engineering David Clarke, Deputy Director Rail Systems, Department for Transport	David will explore DfT's perspective on the SE challenges in rail and share DfT's emerging thoughts on taking a whole-of-life, whole-of-systems approach to meeting them. He will explain DfT's collaborative approach to exploiting opportunities to make system-wide improvements in rail and to resolving systemic problems that are limiting rail systems effectiveness. He will describe the relationship between the rail technical strategy, the technical strategy advisory group and the high level output specification for control period 5, starting in 2014. He will discuss specific current SE initiatives.
1005H	Systems Architecture Kuldeep Gharatya Head of Systems Engineering & Colin Wood, Systems Engineer, London Underground	Creating a system architecture is a core part of classical SE and the subject of established standards such as IEE 1471. This presentation will focus on the experience gained at LU with creating systems architectures for transformation projects. The business benefits that LU has obtained will be described, some problems in applying the standard approach will be introduced and means of overcoming these problems will be suggested. Finally, the presenters will look at the possible application of systems architectures to the whole network.
1100H	SE in ProRail infrastructure projects: lessons learned and way forward Miech Groeneveld, ProRail,	ProRail has gained much experience in applying SE to the implementation of ERTMS in large and small sized projects, including the Betuwe route (freight track from Rotterdam harbour to Germany) and Amsterdam-Utrecht (capacity enlargement). The presentation will focus on the lessons learned from these projects, regarding the approach of 're-use', applying requirements management, setting-up project specifications and their implications for the entire project life-cycle.
1125H	SE Overground Mike Stubbs, Head of Engineering, London Overground Infrastructure, Transport for London	London Overground (LO) is delivering the East Line Project to provide a metro style rail service to the people of east London. LO has applied fundamental SE principles in the light of experience on previous projects. The presentation will consider a number of lessons learnt from this experience. This will be a very practical case study and will consider SE in procurement, delegation of SE responsibilities, making SE happen as a project proceeds and responding to real circumstances. As the project nears commissioning the question is – would we apply SE again?
1200H	Theme 1 Panel Discussion	
1230H	Lunch	

Theme 2: How should we write systems engineering into contracts?		
1330H	The paradox of explicit SE behaviour in contracts Erik Elich, Monto	ProRail has been using the principles of SE when drawing up contracts since the early nineties and considerable cost savings have been achieved as a result. However the roll out of SE has a tendency to emphasise structuring and produce vast detailed specifications which can conflict with true systems thinking and the pursuit of life cycle value. This presentation will draw upon ProRail's experience in order to highlight four paradoxes for discussion: (1) use of common sense versus the 'decomposition disease'; (2) transparency of stakeholder needs versus risk reducing contracts; (3) balancing the SE responsibilities between principal and contractor; and (4) the battlefield of SE, standardisation and contractor dependency.
1355H	Writing SE into Contracts Kuldeep Gharatya, Head of SE, London Underground	Putting in place effective binding contractual conditions on contractors to carry out adequate SE activities and deliverables is not straightforward. It involves a concerted unity of effort and understanding between commercial and systems engineers, who come at the problem from different perspectives, do not share the same vocabulary, methods, processes and life-cycle models. Kuldeep Gharatya will explore the practical realities of holding contracting organisations accountable for the successful integration of systems. He will discuss what needs to go into the contract to enforce not just the planning of the SE activities, but crucially, their implementation.
1420H	Theme 2 Panel Discussion	
Theme 3: How do we find enough rail systems people?		
1445H	Implementing SE in Rolls Royce Richard Beasley, Rolls Royce	Rolls-Royce must deploy SE to deliver increasingly complex solutions, in shorter timescales, with reduced cost. The presentation will explain the approach taken in Rolls-Royce to provide an understandable description of the SE, and how to make the "implicit" use of SE more explicit. SE is a way of thinking which is applicable to all, and which needs to be supported by the right organisation and processes. The presentation will describe how Rolls-Royce is managing the transformation to a SE approach and how it is tailoring the UK INCOSE skills framework to define what SE skills are needed in both new SE and existing engineering roles.
1510H	Embedding SE within Network Rail Brian Halliday, Network Rail	Network Rail has embedded a systems approach in its corporate project lifecycle process, known as GRIP (Guide to Railway Investment Projects). Now it is adopting a two-pronged approach to ensuring that it has the SE capability to apply this approach effectively on all enhancement projects: (1) developing a strong central multi-disciplined systems team; and (2) developing an Engineering Competency Framework to ensure that SE becomes part of everyone's job and to deliver tailored SE training that meet the differing needs of individuals performing different roles. This presentation will describe the reasons for choosing this approach, the progress that has been made and lessons learned to date.
1600H	Catching the wave: How do we find enough rail systems people? Jeremy Gill & Alun Jones, Atkins	The rail SE community must catch the wave of interest in the application of SE to major investment programmes. The presentation will analyse the current strengths and weaknesses of rail SE and the potential opportunities and threats arising from this wave. This will lead to conclusions about how we might match the supply of system engineers to the demand for their services. Simply trying to hire an army of system engineers won't work and we will have to innovate. The presentation will investigate innovative solutions, involving tailoring the SE process, increasing the number of system engineers in rail and embedding aspects of system engineering practice within traditional engineering disciplines.
1625H	Theme 3 Panel Discussion	
1650H	Closing remarks	
1700H-1900H	Social networking event All are welcome to stay and chat in the meeting room and roof terrace. A bar will be available where participants may purchase drinks. A barbecue meal will be served and participants may purchase tickets for this at the time of registration.	