



# preview

International Council On Systems Engineering UK Chapter Newsletter

July 2003

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## New look for INCOSE UK newsletter

Welcome to the new look of the INCOSE UK newsletter. Preview includes some new features such as profiles on key people of the UK Systems Engineering community as well as some of your old favourites like the President's Corner.

Other new features include Around The Regions that focuses on the local activities of the regional interest group. This

is your chance to find out what is going on in your area and to get involved.

Preview offers you an opportunity of posing topical Systems Engineering questions to our expert panel. The editorial team of Preview would like to encourage the readers to continue to submit items of general Systems Engineering news, technical news and

events that may appeal to INCOSE UK members.

Printing and distribution of Preview is kindly sponsored by University College London's Centre for Systems Engineering.

Doug Cowper  
(Editor of Preview)



## Autumn assembly 2003 - a date for your diary

INCOSE UK are pleased to announce that the Autumn Assembly will be held on the 10<sup>th</sup> and 11<sup>th</sup> November. The location has yet to be confirmed, so watch this space. The proposed programme includes:

**Standards** - how standards like ISO15288, CMM etc, are likely to impact on SE practitioners and our companies, and what should we be doing (e.g. educating our management??) to prepare for them.

**Systems Engineering in Different Industries** - using case studies from the transport and defence industries this session will explore their top 5 issues and their differences in approaches to systems engineering including transferable skills.

**Hard and Soft Systems** - a session on hard and soft systems exploring the real difference between the two



and other issues such as how do you know when they stop?

**System Evaluation** further details will follow in due course.

**Systems Dynamics** - this session will provide an introduction on the subject and what types of models are available (archetypes and

reference dynamics). The session will include a set of topics including PM & SE, system evaluation systems.

**Core Competences & Training** - this session will address - what is the formal route to chartered status? What are the core competencies we value? The need to understand what could go into these competencies e.g. knowledge management and capturing experience (where is your corporate knowledge?).

**Closing Plenary** session on Smart Acquisition.

If you have something you would like to share with the assembly on any of these subjects please contact Dipesh Patel on:

020 7308 3448

or  
Dipesh.Patel@tubelines.com

We look forward to seeing you there!

## In brief - SE NAC meets

The DTI sponsored National Advisory Committee (NAC) for Systems Engineering met on 5th June at Shrivenham. The meeting reviewed a number of initiatives including;

competencies working group, RAEng visiting professor scheme, EPSRC's Systems Integration initiative, the Loughborough SE Innovation Centre and ISO15288.

The meeting also discussed the future role of the NAC and its relationships with other organisations.

## In profile Prof. Phil John – president elect INCOSE UK



Phil John is the Director of Cranfield University's Centre for Systems Engineering. Following his PhD at Imperial College, London he spent 18 years in industry, holding a wide range of systems engineering and management roles, including Head of Systems Engineering for a major multinational company. His experience and responsibilities in industry encompassed the whole scope of systems engineering, including Requirements Engineering, System Design, ILS, ARM, Human Factors, Safety, Systems Proving and Simulation & Modelling. Phil joined Cranfield University in 1999 as the Professor of Systems Engineering and leads the very active Centre for Systems Engineering. He is a member of several national bodies, including two National Advisory Committees (for Systems Engineering and for Synthetic Environments), the UK MOD's Smart Requirements Review Board and the IEE's Executive Team on Systems Engineering. Phil's research interests include the development of Complex Integrated Systems; Autonomous Systems; Risk management and achieving a true Whole System, Through Life approach. He has been a member of the UK Chapter of INCOSE since 1995.

### "What do you see as the top five Systems Engineering issues facing UK industry?"

Systems Engineering has come a long way in the last few decades, and, with a great stimulus from INCOSE, in the last decade in particular. There is now much more discipline in our approach to the engineering of systems and we take a much broader view of the "success" criteria our systems must meet through life. In many ways we are better at engineering systems than

ever; and yet we must not be complacent: firstly, major problems still occur far too often in system development programmes; secondly, we can expect the challenges we face to become more severe as systems become increasingly complex and as we are expected to meet ever increasing demands of time, cost and quality. I see the top five Systems Engineering issues facing UK industry as being, in no particular order:

- Moving systems engineering forward to cope with increasing complexity, particularly in highly integrated and autonomous systems, and in Systems of Systems ... systems are changing and so must systems engineering
- Addressing the chronic shortage of people with systems engineering skills and experience ... we must increase the identification and recognition of such skills and the education and development of such people
- Reconciling the often conflicting pressures of a systems engineering approach and commercial practices (e.g. competition; IPR; hierarchical organisations) ... systems engineering issues should be a central influence on business decisions and on customer-supplier relationships
- Achieving a robust approach to the management of Risk at a system level ... in an increasingly demanding and litigious society Developing a cost-effective, consistent suite of system tools to support systems engineering through the whole lifecycle and across the value chain ... we need to develop a robust set of tools encompassing all the needs of systems engineering and also meeting the investment challenges facing organizations.

### "How do you see INCOSE UK's role in tackling these issues?"

INCOSE has made great progress since its inception and fully deserves to be the recognised professional body for systems engineering. The UK Chapter was the first to be formed outside North America and has always been very active. I see a pivotal role for the UK Chapter in many ways, including:

- Providing a forum for ensuring cross-pollination of systems engineering needs and best

practices across industrial sectors such as aerospace, transportation, defence, communications and between customers, suppliers and practitioners across the communities

- Reaching out to all relevant parties, including those who do not realise they are involved, to ensure that the value, importance and potential of systems engineering is fully recognised
- Ensuring a strong UK influence on the many international activities that are now underway, including the formation of the Systems Engineering Body of Knowledge, Competency framework, Standards and Capability Maturity Models Facilitating the development of systems engineering as a profession in the UK, including professional recognition, education etc

Above all, I see the UK chapter as serving the systems engineering needs of the UK, both for individual members and for organisations. The formation of the UK Advisory Board is a significant step forward in the latter ... we need members to be as fully involved in our chapter to as possible to ensure the former.

### "How do you see INCOSE UK's role in influencing the Systems Engineering research agenda within the UK (i.e. influencing organisations like EPSRC)?"

I mentioned earlier that we must not be complacent in systems engineering. The very nature of Systems is changing and, in addition, the demands placed upon us are increasing. There needs to be very active research activity in systems engineering, focused on understanding these challenges and the approaches needed to tackle them. The research agenda must encompass all aspects of the discipline ... product and process ... technical and managerial ... application in different sectors ... and so on. There is a lot that can be done to improve the current research situation and the UK Chapter must take a central role in making it happen. We should:

- encourage, to everyone's benefit, cross-pollination across

the UK community and between the UK and the rest of the world

- ensure the UK influences, and engages in, international research activities
- promote the importance of investment in systems engineering research in organisations such as the EPSRC and the MOD, who have tended to focus investment on individual technological and scientific topics
- encourage the DTI to promote systems engineering as a strategic national capability, as exposed by the Foresight initiative
- promote systems engineering in the wider research context, including socio-technical aspects with organisations such as the ESRC

The members of our UK Chapter have senior level contacts with almost all these areas and organisations and so we have real opportunities to influence the research agenda. As a Chapter we should encourage such influence to be made and also provide people with the evidence and information needed to convince the senior decision makers.

### "What changes/additional activities do you have planned for your term of office as INCOSE UK Chapter president?"

It is still early days yet and I am still forming my detailed thoughts ... and learning a lot from people like Paul Davies, who has been such a dedicated President for the past two years. I am very impressed by the wide range of activities that have been initiated by the UK Chapter Board and I would hope to take those forward to fruition. I am particularly keen to stabilise and grow our individual membership, to develop the corporate relationships through the UK Advisory Board and to encourage increasing involvement from all application sectors. In order to achieve all this we must, above all, deliver benefit to our members, both individual and corporate. This must be the acid test for all that we do and I encourage all to get involved so that the UK Chapter delivers real value to help you achieve world class systems

In profile next time, Dipesh Patel, Chairman of the SEPDC

## President's corner



The latest INCOSE International Symposium took place in Washington DC a couple of weeks ago, with over 1000 attendees. I went along to fly the flag for UK, and was pleasantly surprised that there were 28 others from this sceptred isle, plus one from 'Scotland' – you know who you are! This was more than any other non-US Chapter, and indeed more than any US State except Virginia and Maryland (the locals), and California (which I think counts for 3 separate Chapters).

I spent a great deal of my time in various Committee meetings, but still got to see a few paper presentations. There was the usual mix of really good stuff, potentially good stuff that didn't tell me anything new, and a few absolute turkeys. I came away feeling that

the handbook ought to indicate whether the paper is intended for new practitioners or for old hands – I guess it's too much to ask to indicate the turkeys! In any case, it's always worth going, as I always take back a handful of usable ideas for the day job. Next year the Symposium will be in Toulouse, 20-24 June 2004, start planning (and submit a paper) now!

Apart from the Board of Directors at the top, INCOSE is driven by three organisations setting the agenda:

- the Corporate Advisory Board (CAB) comprising the major employers, wanting INCOSE to achieve aims of value to their organisations;
- the Technical Board (TB), which controls the technical products, provides a co-ordination role for the Working Groups, and runs the Symposium review processes;
- the Member Board (MB), which represents the needs of the members via Chapter and Regional representatives

In Washington, the three organisations had got together and prioritised initiatives for INCOSE for the coming year. Their priorities

were of course different, but overlapped sufficiently to be workable. I can summarise them as follows:

**CAB1** "Quantify the value of SE to an organisation" (start with an easy one, why don't you!)

**TB1** "Develop a Technical Vision" [i.e. how does the organisation develop WG's, products and position statements for the future]

**MB1** Recognise best practice through Chapter Awards, with the aim of exchanging good practices to help all Chapters improve and expand

1. Develop the SE Handbook, Version 3. [Version 2 is a free download from the members' area of the website, a pretty good reference text which could still benefit from improvement.]

2. Develop the Guide to the Systems Engineering Body of Knowledge (SEBOK). This will be the condensed version of the Handbook, plus lots of references (cf the PMBOK, already in existence for Project Management).

3. Implement the Systems Engineering Certification Process. ...Which brings me to the debating point for this newsletter issue. 69 people took a 6-hour test which will, if passed, enable them to call themselves 'Certified Systems Engineers'. Well actually

that's not quite true; they also have to be members of INCOSE in good standing, have letters of recommendation from some recognised SE authorities (I'm not quite clear on this point), and pass an interview with some other recognised SE authorities.

If you think this is starting to sound like the accreditation process to becoming a Chartered Engineer, you're not far wrong. David Wright is working on a mapping process to draw parallels and (long-term) maybe work with IEE towards a formal Chartering process. But my question is this: "What do (a) the members, and (b) the employers, want from a certification process?" Specifically, is it an aim to be able to proceed to Chartered Engineer status in Systems Engineering as a recognised discipline; who would administer it; who would 'count' as recognised authorities?

I didn't say the question would be easy. I do, however, expect all readers to have an opinion, and to let us know. Please reply to any of the Points of Contact elsewhere in the Newsletter.

Paul Davies  
President of the UK Chapter

## INCOSE UK membership 2003/4



What a fantastic level of on time renewals this year! Our membership year starts on June 1<sup>st</sup> and including new members we have 245 that have paid already. There will still be some that are too busy/ slow/ distracted or whatever and who miss the renewal deadline and therefore the journal or INSIGHT or cannot access the members web-site etc. Do not be one of them. Send a cheque for £60 payable to INCOSE UK to

John Mead together with your name and or membership number. Alternatively do away with the problem - complete a Direct Debit form available from the web-site or the administrator. Well over one third of members pay this way now and it saves us time and money in administration.

John Mead  
UK Administrator

## Advertise in pre VIEW

If you are looking to contact the Systems Engineering Community in the UK, why not place an advertisement in preview?

For more information about our competitive rates please contact:

Guy Tugwell on 01792 417227  
or  
email: [guy@brass-bullet.co.uk](mailto:guy@brass-bullet.co.uk)

alternatively contact

John Mead on 01344 422325  
or  
email: [john.mead@ntlworld.com](mailto:john.mead@ntlworld.com)

## Spring symposium 2003 - in colour

This edition's featured item is the UK Chapter's Spring Symposium. For those of you who missed the event, it included a key note address from INCOSE's President Elect Heinz Stoewer, a full programme of SE topics and an entertaining after dinner talk from Steven Carver.

Copies of the proceedings are available on CD from John Mead for a small investment!

During the event the INCOSE UK board also held a joint strategy meeting with the UKAB (advisory board). The main item on the agenda discussed



was the recruitment of further corporate members in the UK. A membership document and an executive summary have been produced by Paul Davies and will be used to enlist new members. A hit list of companies has been drawn up and the INCOSE UK board & UKAB will be actively following up this list.

If your employer would be interested in getting involved with steering INCOSE UK working group activity, arranging themes for INCOSE UK events or the benefits of being a UKAB member, please contact any of the UK board (see back page) and we will be happy to talk to you and your employer.

## Kill something and eat it every day!



In his keynote speech for the Spring Symposium, Heinz Stoewer, set the standard for the rest of the conference. With his witty delivery and wealth of experience he delivered a four part presentation which tackled the most difficult issues in SE that face us all today, placing the challenges of the future squarely at every systems engineers' door.

The future will be different, this is obvious to everyone, but what is not clear is how Systems Engineering must prepare for it. As the world moves towards a global engineering environment, with engineering of complex systems combining multiple advanced technologies, distributed worldwide production capability and cross investment, mergers and transnational cooperatives, the pressure on industry to perform and deliver can only increase.

All this means that the nature of Systems Engineering must continue to change in order that we can engineer the new technologies and the increasingly complex systems of systems and adapt our processes and our tools

to meet the challenge of applied SE. To help Systems Engineers with this challenge a future INCOSE publication "INCOSE Perspectives / Technical Vision for Systems Engineering 2015" is being developed. This publication aims to outline the challenges of the future, so that we can mould present day SE development to ensure that we can adapt in the future.

Projects fail every year wasting billions of pounds, many more overrun at great cost to the parties involved. As Systems Engineers we understand that this is largely due to requirements failures of one sort or another. It is for this reason that many companies invest in Requirements Management at the early stages. However, it is becoming clear that this is not enough. Recently many studies have shown that investment of money in the concept stages of a project, coupled with an integrated, multidisciplinary team comes a long way to mitigating the risk of over-run and fail-

A case study proved to illustrate these points: Company a and Company b proposed a satellite for the German SAR-Lupe defense reconnaissance project. a had previously built a huge satellite in the 1990s and b had not built anything comparable ever and had hence chosen to bid several small satellites to do roughly the same job. The comparable costs and timescales of the two suppliers were vastly different as a were for too long holding on to the 10 year old technology and b were proposing a solution based on advanced current technology. b won the project, proving that adapting to the future is better than relying on a "this is how it is done" methodology.

Another case study showed that the careful application of model based SE can massively reduce the cost (by 66%) and time (by 92%) of early mission proposals and a reduction in concept design time of 92%, thus showing again that "Systems Engineering is a competitive discriminator".

In this increasingly complex environment where SE is involved in the entire project throughout its lifecycle and where systems engineers are increasingly located in the centre of the engineering process and in support of the project management, the interactive integration function is the primary SE role. So to all of you out there from Heinz's vast experience comes a challenge to all SEs:

Go out and cultivate interactive interfaces with the rest of the company and fulfill your central project role.

And don't forget that if we do things the way we have always done them, and do not adapt to the changes ahead of us, SE will not be part of the future. So don't just kill something and eat it every day, talk to your food nicely, find out its needs and problems, think about how SE can be developed to help, and do it!

Anne Hoath.

***"The future will be different, this is obvious to everyone, but what is not clear is how Systems Engineering must prepare for it."***

ure. In fact models show that 70 to 80% of the cost of project is committed in the concept stages, with only some 5 to 15 % of the cost of the project invested at that stage. As a result of this knowledge, it is increasingly recognised that there is a need to move towards better systems engineering at the early stages of a project and may be towards capability- instead of requirements based specifications.

## How was it for you?



**A review of your comments as written on the Symposium Improvement Questionnaires.** - Therefore this is mostly written by you.

The usual broad range of topics were covered in the responses and as usual there were total contradictions and totally opposing views about the same thing. We have therefore accepted that we will never get it right for everyone but we do take note of your comments and are always looking to improve things. Sometimes I think, if only I had known that one person could not see the screen I could have moved them, or as we had one delegate whose room at the hotel was too hot and another whose room was too cold I may have arranged a swap. Someone did not find the tea and coffee in the pull out tray in the cabinet, or did they really not have any? All that said the majority view of the venue was "Excellent".

**Tutorials** - We did not have a good turn out for tutorials and clearly we need to find some new topics. If you can help in this direction please advise any board or committee member. We had virtually no returns on tutorials although we know that one in particular was a lot of fun as well as very educational!



The conference itself got off to a very good start with The President - Elect of INCOSE Prof. Heinz Stoewer kicking off with an exceptionally good Keynote presentation. The

only negative comment was that it was too fast, as we had not given him enough time in the programme; otherwise it was rated very good, thought provoking, excellent, brilliant, entertaining etc. An article written by Anne Hoath covering this presentation can be found on the previous



From left to right, John Mead, Steven Carver and Paul Davies

page, and Heinz has kindly permitted us to show his presentation on the web-site. Hopefully you have already had a run through this at your own speed.

The business case for Systems Engineering clearly had a class act to follow and in many peoples eyes did not match up. Only "The need for available case studies" really lived up to expectations. It appears that we need to do more in this area as this was described by one delegate as - a missed opportunity!

The sessions on Requirements and that on Architectures achieved equal top ratings in your responses with some papers achieving very high ratings, which suggests that we do know our business even if we are not good at selling it.

Human Factors was also highly thought of as was Techniques although the latter was perhaps an area where totally divergent and opposed comments were received on the same paper or points. What can INCOSE do for you will clearly be repeated when we have a good number of new members although next time with more preparation.

**What did you not like?** Poor time keeping by presenters! Noted. It is not the first time that we have had this comment and we will keep trying to improve in this direction. This is particularly so because it has knock on effects throughout the day with meals and other items being upset. Catering staff may be available at the appointed time but if we are late have been deployed elsewhere by the time we turn up.

**What else?** Non availability of CDs on the first day. This as usual is dictated by receipt of the input.

able when you want them. However we will do better!

**What did you like best?** The most enthusiastic praise here was for our after dinner speaker Stephen Carver. Stephen was very entertaining, and thoroughly enjoyed by all. Stephen had to battle through abnormally excessive traffic on the M25 to get there and



had to leave immediately upon completion to make an appointment on the continent early the next morning. I also publicly thank Stephen for the extremely favourable terms on which he performed for us. Stephen may be contacted on [s.carver@cranfield.ac.uk](mailto:s.carver@cranfield.ac.uk).

Your comments and suggestions about our next event have been noted and as far as is practical will be accommodated. However remember that the Autumn Assembly is a working event on chosen topics and does not have a CD or proceedings so if you want to learn, network or make your view known - be there! The dates are Nov. 10 & 11<sup>th</sup> and a draft programme has been thrashed out, see the front page.

**In conclusion.** The venue, format, and very competitive price were all favoured by the majority, our President's view was that it was our best ever and I repeat a comment received about the technical programme - "Finally a conference relevant to all aspects of Systems Engineering"

John Mead  
UK Administrator

We wait as long as possible for the papers, because you also comment when papers are not included, but we are then in the hands of the producers, and this time we ran without a label and one paper, and they were still two days late. Our volunteer did his best but if the presenters will not produce material on time we have little option - either we leave stuff out or the CDs are not avail-



## Events calendar

### September

10th September

Launch meeting of the Stevenage Group at 18.00 for 1830 start at EADS Astrium Ltd in Gunbels Wood Road, Stevenage. The event's theme is BEAGLE 2 - "ENGINEERING A LANDER FOR MARS"

### October

16th October

London Region Group Meeting - rescheduled presentation by Michele Dix, Director of Congestion Charging, Transport for London

### November

10th - 11th November

INCOSE UK Autumn Assembly, venue to be determined.

### Next Year

20th - 24th June 2004

14th Annual International Symposium & 4th European Systems Engineering Conference - Toulouse, France  
www.incose.org/symp2004/

If you have an event you would like published in preview then please contact:

d.cowper@ucl.ac.uk

## Your questions - answered

**In a recent meeting, a UML diagram of relationships in a supply chain was tabled. The people round the table found the diagram difficult to understand. However, when an equivalent bubble diagram was tabled they understood it immediately. Given that UML is being adopted by both Systems Engineers and Business Process Modellers, why is it that senior management and people generally find it easier to understand a bubble diagram which does not conform to any standards than an equivalent UML model?**

DC, Cheltenham

Understand it as they are "not technical people" and it is "too complicated" for them. If, on the other hand, you describe it as a picture, then they will understand straight away. This approach has worked with senior managers, school teachers, 8-year-old school children and even politicians!

Another aspect of this issue is how well the diagram was drawn. Just because something is put into UML does not make it good, or correct. For example, which diagram was being used and was it appropriate? I have a rule that says that you should be able to explain your diagram to

**tored? It will become much more useful as a language when it is universally understood outside the software engineering community, yet the scarcity of books on the subject suggests that not much is going on outside of software? ME, Woking**

UML is being used extensively outside the software world for an incredible number of applications, such as: process modelling, requirements modelling, quality assurance, finance, project scheduling, education, standards analysis and definition, architectural specification, reverse engineering legacy systems, etc.

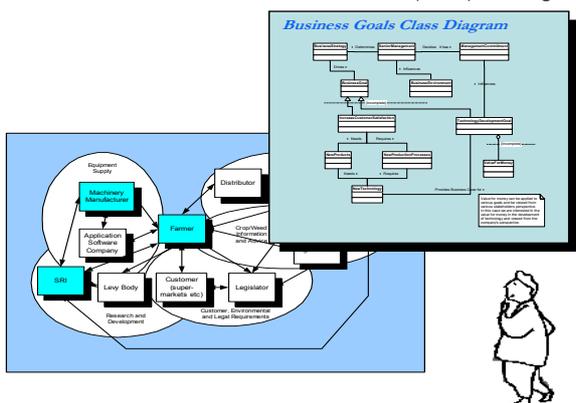
The UML is intended to be a general-purpose modelling that can be applied to almost any application. Having its roots in the software world can be both a blessing and a curse. Quite often, too many people think that it is for software systems only, but this is simply not the case. The UML is a way to communicate with people and systems using a visual simplified version of reality.

For specific application, it is possible to tailor the UML to meet specific needs using things called "profiles". A profile is simply a collection of extensions to the UML with a specific purpose in mind, for example, real-time systems, systems engineering and process modelling.

In order to give an indication of an application of the UML outside the software world, consider the electronic Government

Interoperability Framework (eGIF), which is intended to create "better public services tailored to the needs of the citizen and business require the seamless flow of information across government. This latest version of the e-GIF sets out the government's technical policies and specifications for any ICT system across the public sector. Adherence to the e-GIF policy is mandatory." The eGIF, which is also described, in the same report as "the cornerstone to eGovernment strategy" mandates the use of the UML. Now consider which industries this will impact.

As for books, there is a book called "UML for systems engineering - watching the wheels" which is published by the IEE and covers some of the issues.



It would be interesting to know if the people were told that it was a UML diagram as, in my experience, telling people that it is UML can often be counter productive. I have found, quite extensively, that if you start a discussion with "this is a UML diagram" then the audience will not un-

derstand it. If not, you may have to question the validity of the diagram.

**How many people are using UML other than for software engineering? Is its usage being moni-**

If you have a question you would like answered by our panel of experts or a point of view you would like to share with Preview readers then please send it to:

d.cowper@ucl.ac.uk

or write to:

Preview  
c/o UCL Business  
2-16 Torrington Place  
London, WC1E 7HN

## Around the regions

### London

INCOSE UK's London Region Interest Group's (LRG) held its 2nd meeting on the evening of Wednesday 30th April at the American International University in London, based in Richmond, Surrey. The meeting was well supported and focused on the theme of the top five Systems Engineering issues facing the transport industry. A series of short presentations were given by:

- Mike Hayward of Carl Bro Ltd (road transport)
- Kuldeep Gharatya of London Underground Ltd
- Dipesh Patel (standing in at last minute for Glyn Roberts who was unable to make the event) of Tube Lines Ltd
- Brian Halliday of Network Rail

The event generated a series of discussions which probably could have gone on all evening. The main themes that came out of the presentations are summarised as follows:

#### Mike Hayward – Carl Bro Ltd

- Technology Refresh/Legacy Systems
- Verification & Validation of Downloadable Software
- Software Configuration Control
- Data Security/Use
- Human/Expert Systems Interaction

#### Kuldeep Gharatya - London Underground Ltd

- PPP Environment Challenging to the Traditional Application of SE to Projects
- SI Challenge (Capability Integration)
- Communication & Language
- Development Time (SE is a Long Term Activity)
- Growing of SE Capability with LUL Domain Knowledge

#### Dipesh Patel – Tube Lines Ltd

- Introducing SE Into an Organisation
- Legacy Systems
- V & V, Requirements Capture & Tracability
- Contract Interfaces/Risks
- Future Management (Sustainability, Training, Accreditation)

#### Brian Halliday – Network Rail

- Systems Approach Culture (Institutionalised within Organisational Structure)
- V & V
- Systems Engineering Gaps
- Whole Life Concept
- System Complexity

These issues were compared to the top five identified by the Defence Industry:

- Lack of awareness of the importance, value, timing, accountability, and organizational structure of SE on programmes
- Adequate, qualified

resources are generally not available within Government and industry for allocation on major programs

- Insufficient SE tools and environments to effectively execute SE on programs
- Requirements definition, development and management is not applied consistently and effectively
- Poor initial program formulation

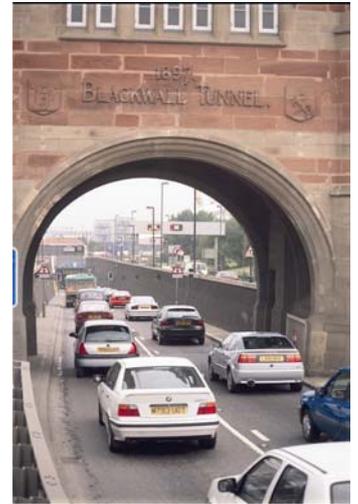
The results of the evening were fed back into INCOSE UK to help steer/generate working group activity to address these challenges.

The meeting also elected volunteers to help sustain the LRG activity. The roles and volunteers were:

- Group Co-ordinator – Kuldeep Gharatya, Derek Price
- Meeting Organiser – Doug Cowper
- Deputy Meeting Organiser – Dipesh Patel, Kevin Tarling
- Communications – Margaret Myers
- IEE Liaison – Mike Hayward

The meeting agreed that these positions will be reviewed annually.

The next event LRG event was to be held on Friday 18th July in the Haldane Room at University College London. Unfortunately our guest speaker, Michele Dix who is Director of



Congestion Charging (which is a division of Street Management in Transport for London (TfL)) was unable to make the meeting and as a result it was cancelled at short notice. Apologies for any inconvenience caused. We have managed to rearrange the briefing by Michele on the congestion charging project and a current status of the results on 16th October. The next LRG meeting will be advertised shortly.

Douglas Cowper, University College London Centre for Systems Engineering

### Stevenage



INCOSE UK's Stevenage Group will be holding their launch meeting on:

**WEDNESDAY SEPTEMBER 10<sup>TH</sup>**

at 18.00 for 1830 start at EADS Astrium Ltd in Gunnels Wood Road, Stevenage.

The event's theme is BEAGLE 2 - "ENGINEERING A LANDER FOR MARS"

- full of topical interest with it's forthcoming departure!

If you are able to help with running the regional group activity, or have any suggestions for future themes, please contact Les Oliver on les.oliver@astrium-space.com

Watch the website for further information.

### How do you get involved with regional activity?

Are you are looking to participate in local INCOSE activities?

or

Are you looking to set up a regional group ?

For more information about regional activities or how to go about setting up a regional group, please contact:

John Mead on 01344 422325

or

email: john.mead9@ntlworld.com

## Managing the Challenges of a Complex Future –

understanding systems engineering and a systems approach to the way complex entities are formed, especially in a rapidly changing environment.



## MSc in Systems Engineering Management

University College London's MSc in Systems Engineering Management is a modular based programme designed by a multi-disciplinary team of UCL academics and industry practitioners, ensuring high standards of delivery and commercial relevance. The course offers convenient modes of study and attracts individuals from a wide range of industrial backgrounds, which enriches the delegate interaction and debate.

### The course offers:

- An integrated view of complex systems and the environment in which they are constructed
- A range of ideas and techniques for managing complete systems
- Systems Engineering design, modelling and verification techniques
- Supplementing and up dating your skills to ensure continuous professional development
- A good alternative to an MBA for individuals who want to keep their technical career path

### Aimed at:

- Technical Project Managers
- Engineering Managers
- Engineering Team Leaders
- Engineers working on systems projects

### Course Includes:

- Systems Engineering Overview
- Systems Lifecycle
- Systems Requirements
- Systems Design
- Systems Modelling
- Systems Integrity
- Project Management
- The Business Environment

To find out more visit our website at:

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