

2-3 September 2014 (Leatherhead)

As more and more safety-related complex systems depend on software to achieve fit-for-purpose functionality, structured software hazard analysis becomes indispensable when developing software, minimizing risk and preventing harm to both equipment and human life. Taken from a civil aviation and defence context, this detailed course offers a solid introduction to the techniques for analysing potential software safety issues and the creation of software safety arguments. Exercises and discussions enhance the content covered.

## Your Programme

### Day one

**8:45** Registration and refreshments

**9.00** Introduction

**Overview and software safety concepts**

- Aim and scope of the course
- Regulations and standards
- Safety management and the life cycle.

**Exercise: Software safety argument**

**10:00** Safety requirements for software

- Type of safety requirements
- Determining software safety requirements
- Validation and traceability.

Refreshments

**Group exercise: Software requirements**

**11:40** Safety Integrity Levels (SILs) for software

- Using hazard analysis to find SILs
- Alternative definitions of SILs
- Partition and independence.

**12:30** Lunch

**13:15** Safety planning for software

- Life cycle and processes
- Safety planning requirements.

**Discussion: Use of software safety design techniques**

**14:00** Software safety design

- Fault tolerance concept
- Checking hardware
- Software self-checking.

Refreshments

**Group exercise: Safety design**

**15:40** Software testing

- Testing life cycle: levels of testing
- Adequacy of testing and test coverage
- Test planning and specification.

**Exercise: Test coverage**

**17:00** Summary, discussion and questions

**17:30** Close.

### Day two

**8:45** Refreshments

**9.00** Introduction

**Overview: safety analysis and argument**

- Safety case: evidence and argument
- Safety analysis for software
- The Commercial Off-The-Shelf (COTS)/Software of Unknown Pedigree (SOUP) problem.

**09:45** Software safety analysis techniques

- What is software safety analysis?
- Analysis techniques and examples
- Standards.

Refreshments

**Group exercise: Software safety analysis**

**11:40** Programmable Logic Devices (PLDs)

- Types of devices and types of evidence.

**Discussion: Extent of use of PLDs**

**12:30** Lunch

**13:15** Coding and analysis

- Language selection
- Beyond testing: static analysis
- Light weight formal methods.

**Exercise: Code review**

**13:45** Safety arguments for software

- Structure of a safety case – evidence and argument
- Review of an example safety case
- Arguments in practice: notations.

Refreshments

**Group exercise: Safety argument**

**15:45** Designing a safety system with SOUP

- Stages of safety justifications
- Summarising and combining evidence
- Architectural safety
- Weighing-up the use of SOUP.

**Group review: Proposed Off-The-Shelf (OTS) solution**

**16:45** Summary and questions

**17:00** Close.

## Ever thought about in-company training?

ERA can deliver this course at your site, either in standard public format, or as a bespoke option tailored to your organisation's individual specifications. To discuss your training requirements, please call the Events Team on +44 (0)1372 367319.



## Your Speakers



### Clive Lee - Senior Safety Consultant, ERA Technology Ltd

Clive has over 40 years' experience in systems analysis, software development and assessment of real time, embedded systems and IT applications. A qualified Structured System Design and Analysis Development Method (SSADM) practitioner for large government IT applications, Clive has been involved in software and safety assessment and consultancy in a variety of industry sectors such as military (all forces), railways, process chemical and nuclear.



### Dr. William Marsh - Lecturer, School of Electronic Engineering and Computer Science, Queen Mary, University of London

William has been working in the field of software and systems safety and dependability since 1989. His experience has included the development of tools and techniques for static analysis of safe subsets of programming languages. He has audited a number safety-related software development projects and carried out research in new techniques.

## Booking Form

Please photocopy this form if you wish to register more than one delegate.  
Send a second person at a discounted price!

### Delegate details

Name Dr Mr Mrs Miss
Job title
Organisation
Address
Postcode
Telephone
Fax
E-mail
VAT Number (EU customers only)

### Bookings

I wish to make a firm booking for:

**Software safety: Software development for safety-related systems**

2-3 September 2014

### Fees\*

Fee rate	Fee	VAT@20% <sup>†</sup>	Total	Please Tick
<b>Early booking rate</b>	£720.00	£144.00	£864.00	
<b>Standard rate</b>	£800.00	£160.00	£960.00	

\*AccessERA subscribers and additional delegates receive a 10% discount on these rates. If you subscribe to AccessERA and would like to use your AccessERA credits to attend, please contact the Events Team on: +44 (0)1372 367319. For more information on booking rates, please go to: <http://shop.era.co.uk>.  
<sup>†</sup>VAT only applicable to companies based in the UK.

### Payment method

Purchase order no.....

Payment of £..... is enclosed OR please charge to:  
Access/American Express/Delta/Diners Club/Eurocard/Mastercard/Switch/Visa

Name of cardholder:.....

Cardholder's telephone.....

Card number

Expiry date   Issue No

Payment has been made by bank transfer

By signing and returning this form to ERA, you agree to be bound by the following (in order of precedence): (1) the terms of this booking form; (2) ERA's Special Terms and Conditions\*; and (3) ERA's Terms and Conditions of Sale\*\*.

Name..... Signature.....

\*available at <http://shop.era.co.uk/main.asp/sitepages=TermsPage>  
\*\*available at [www.era.co.uk/terms-and-conditions-of-sale](http://www.era.co.uk/terms-and-conditions-of-sale)

### Venue:

Your course will take place at ERA Technology Ltd Training Centre, Cleeve Road, Leatherhead, Surrey, KT22 7SA, UK. It is a 15-minute walk from Leatherhead main-line station. Visitor car parking is available on-site. A location map and directions are available at: <http://www.era.co.uk/find-us/>.

### Early booking rates:

Early booking rates are valid up to one calendar month before the date of the course and can only be claimed at the time of booking.

### Additional booking rates:

Additional booking rates are applicable to second and subsequent delegates and may only be claimed at the time of booking.

### Did you know?

An AccessERA subscription is an excellent way of accessing technical advice and information in the right format at the right time. All AccessERA subscribers receive a 10% discount on the current course price at the time of booking when the booking is made directly with the Events Team. To find out more, please call us on: +44 (0)1372 367319 or e-mail: [events@era.co.uk](mailto:events@era.co.uk).

### Ways to book:

- <http://shop.era.co.uk>  
Total security is assured and normal booking conditions apply.
- +44 (0)1372 367319 - Please be prepared to quote a purchase order number or supply us with credit card details.
- +44 (0)1372 367321\*
- The Events Team, ERA Technology Ltd, Cleeve Road, Leatherhead, Surrey KT22 7SA.

\* Please note that booking forms received without payment will be considered binding and invoiced automatically.

### Enquiries:

Please contact the Events Team by calling: +44 (0)1372 367319 or e-mail: [events@era.co.uk](mailto:events@era.co.uk).

### How to pay:

Payment must be made before attendance at the event and must be made in £ sterling only. Acceptable methods of payment are by cheque (payable to ERA Technology Ltd), credit card or bank transfer. Bank transfers, free of all charges, can be made to ERA Technology Ltd via: HSBC, 9 The Boulevard, Crawley, RH10 1UT; sort code: 40-18-22, account no. 22178095. When paying by bank transfer; please quote the relevant course, course date and the delegate and company name.

### Cancellations and transfers:

Cancellations and transfers must be received in writing to the following address: The Events Team, ERA Technology Ltd, Cleeve Road, Leatherhead, KT22 7SA. Cancellations and transfers received up to the 15th working day prior to the event will be subject to a charge of 20% of the invoiced course fee + VAT or 20% of the AccessERA credits charged. After this 15-day deadline, transfers cannot be accepted and cancellations will be subject to payment in full or 100% of the AccessERA credits charged. Delegate substitutions can be made at any time.

### ERA Technology Ltd:

ERA Technology Ltd works at the leading edge of advanced technology consultancy and design. The business provides specialist, high value-added, technology-based services including design and development, testing, assessment and expert advice. For further information visit: [www.era.co.uk](http://www.era.co.uk).

- Please tick here if you would prefer not to receive details about future events or services offered by ERA Technology Ltd.

ERA Technology Ltd reserves the right to change, postpone or cancel at short notice any part of its published programme due to unforeseen circumstances. In the unlikely event of cancellation, a full refund will be made of the registration fee. ERA Technology Ltd disclaims any further liability.

For Training & Information use only Project No:.....

Invoice  Paid  AccessERA credits

Date:..... BC No:.....