

# Project Performance International

## Systems Engineering

### Newsletter (SyEN)

SyEN #015 - December 22, 2009

Brought to you by Project Performance International

<http://www.ppi-int.com/newsletter/SyEN-015.php>

Dear Colleague,

**This is the last issue of SyEN for 2009; the next issue will in January, 2010. We wish our readers: clients and friends, season's greetings and a new year full of peace and happiness in 2010. Thank you for your interest and support in 2009.**

SyEN is an independent free newsletter containing informative reading for the technical project professional, with scores of news and other items summarizing developments in the field, including related industry, month by month. This newsletter and a newsletter archive are also available at [www.ppi-int.com](http://www.ppi-int.com).

**Systems engineering can be thought of as the problem-independent, and solution/technology-independent, principles and methods related to the successful engineering of systems, to meet stakeholder requirements and maximize value delivered to stakeholders in accordance with stakeholder values.**

If you are presently receiving this newsletter from an associate, you may receive the newsletter directly in future by signing up for this free service of PPI, using the form at [www.ppi-int.com](http://www.ppi-int.com). If you do not wish to receive future SE eNewsletters, please reply to this e-mail with "Remove" in the subject line, from the same email address. Your removal will be confirmed.

We hope that you find this newsletter to be informative and useful. Please tell us what you think. Email to: [contact@ppi-int.com](mailto:contact@ppi-int.com).

## What's Inside:

[READ ALL](#)

[A Quotation to Open On](#)

[Featured Article: Common Sense on Reliability Engineering \(Part 2 of 3\)](#)

... [READ MORE](#)

### Systems Engineering News

- Artificial Intelligence for Engineering Design, Analysis and Manufacturing (AIEDAM) - Special Issue on Configuration
- ManTech to Offer Certifications from International Council on Systems Engineering
- INCOSE Election Results
- Invitation to SEMAT - The Software Engineering Method and Theory Initiative

... [READ MORE](#)

[Featured Society - Association Française d'Ingénierie Système \(AFIS\)](#)

... [READ MORE](#)

[INCOSE Technical Operations - INCOSE Global Earth Observation System of Systems \(GEOSS\) Working Group](#)

... [READ MORE](#)

### Systems Engineering Software Tools News

- Artisan Continues Industry Consolidation with Extessy Merger
- System Quality Requirements Engineering (SQUARE) Tool
- 3SL/Cradle: November 2009 Newsletter

... [READ MORE](#)

## Systems Engineering Books, Reports, Articles and Papers

- Errata
  - Decision Making in Systems Engineering and Management
  - Analytical Methods for Risk Management: A Systems Engineering Perspective
  - Handbook of Research on Discrete Event Simulation Environments: Technologies and Applications
  - Cause-Effect Diagrams: A Pragmatic Way of Doing Root-Cause Analysis
  - UML Profiles Target DODAF, MODAF, SOA and Systems
  - MV-22, F-35B: Systems Engineering Fail!
  - Life Cycle of a Silver Bullet
  - Behavioral Modeling for Embedded Systems and Technologies: Applications for Design and Implementation
  - Call for Papers: ACM Transactions on Autonomous and Adaptive Systems Special Issue On: Pervasive Adaptation: Visions & Challenges
  - Human Factors in Requirements Engineering: - A Survey of Human Sciences Literature Relevant To the Improvement of Dependable Systems Development Processes
  - Managing Legal Texts in Requirements Engineering
  - Change Impact Analysis for SysML Requirements Models based on Semantics of Trace Relations
  - Standard High Level Modelling Language Aids Safety Systems
  - The Systems Engineering Delusion
- ... [READ MORE](#)

## Conferences and Meetings

... [READ MORE](#)

## Education and Academia

- Accelerated Master's Program Aims to Provide Affordable Education, Career Training to Veterans in Only One Year
  - New Certificate Programs Offered at Eastern Oregon University
- ... [READ MORE](#)

## Some Systems Engineering-Relevant Websites

... [READ MORE](#)

## Standards and Guides

- ISO/IEC/IEEE 12207 and 15288: The Entry-Level Standards for Process Definition - Part 1
- ... [READ MORE](#)

## PPI News

- PPI Releases 2011 Public Course Schedule
  - A Systems Approach to Love, Life and Business
- ... [READ MORE](#)

## PPI Events

... [READ MORE](#)

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# A Quotation to Open On

*"There is only one nature - the division into science and engineering is a human imposition, not a natural one. Indeed, the division is a human failure; it reflects our limited capacity to comprehend the whole."* - Bill Wulf

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## Feature Article

### Common Sense on Reliability Engineering (Part 2 of 3)

Albertyn Barnard

*“Unfortunately, the development of quality and reliability engineering has been afflicted with more nonsense than any other branch of engineering.” - Patrick O’Connor*

In the first part of this series, it was argued that Reliability is the absence of failures in products and systems. Furthermore, Reliability Engineering can be defined as the management function that prevents the creation of failures by people (such as systems engineers, design engineers, production personnel, users and maintenance personnel).

The ideal state of “absence of failures” can only be achieved in practice by preventing failures from occurring in the first place. However, the prevention of failure is only possible if we (preferably during design and development) develop a thorough understanding of potential failure modes, **and then take appropriate steps to prevent them from occurring**. This understanding of potential failure modes is obtained by using “Analysis” and “Test” as design and production verification methods as indicated in Figure 1.

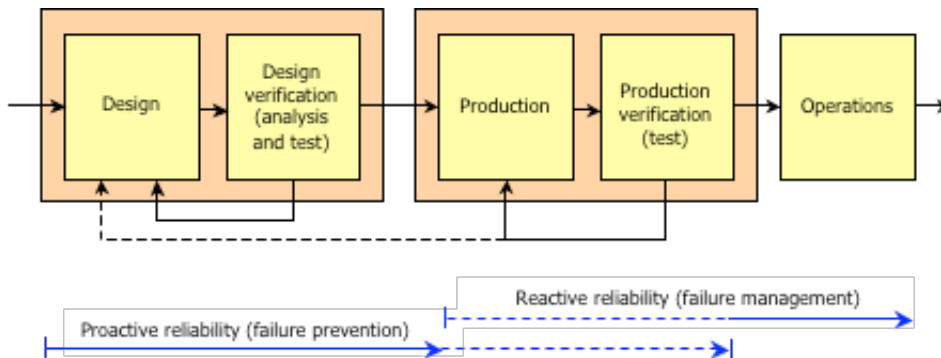


Figure 1: Verification of design and production

## What is meant by “Analysis” in this context?

### 1 Design analysis

Many development activities involve both “design” and “analysis” aspects, which can be totally integrated or not, and which are typically iterative in nature. For example, an electronics engineer may select a certain circuit configuration, and then simulate (i.e. analyse) the chosen circuit to verify intended operation. In most cases, these circuit design tools can also be used to develop an understanding of potential product failure modes. In this example, the designer may include component tolerances, expected operating temperature and parameter drift with the nominal values in the simulation model and evaluate the design under worst case conditions (e.g. using Monte Carlo simulation).

Figure 2 shows the results of a worst case Monte Carlo simulation of an active low pass filter. If you intend to use this particular circuit in a product, variation in frequency response between individual products will most probably lead to unacceptable field reliability.

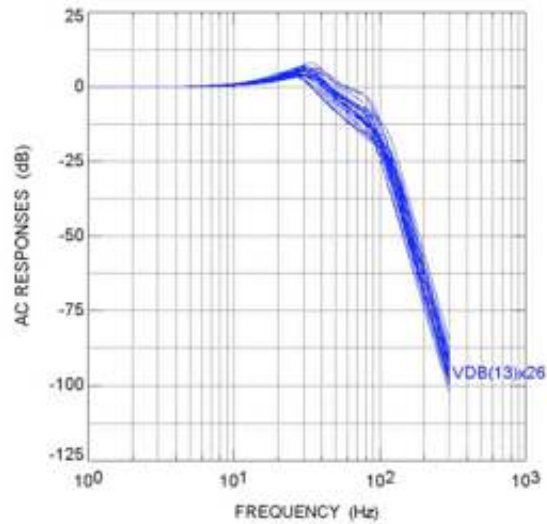


Figure 2 : Monte Carlo simulation of active low pass filter

There are many other examples of “design” tools that can be used as “analysis” tools. In fact, any design tool that provides knowledge on potential product failure modes, and the prevention thereof, can be used as valuable reliability engineering tool. Other examples include electronic component derating analysis, tolerance analysis, signal integrity analysis, electromagnetic compatibility analysis, thermal analysis, finite element analysis, vibration and shock analysis, load-strength analysis and fatigue analysis.

## 2 Failure analysis

Failure analysis, performed with the objective of understanding how the product or system will react to potential failure modes, is extremely useful to influence a design. Typical analyses include reliability block diagram analysis, design (and process) FMEA (Failure Mode and Effects Analysis) and FTA (Fault Tree Analysis).

FMEA can be described as a bottom-up analysis where potential failure modes of a product or system are identified, and the effects of these failure modes on a higher level are determined. For each potential failure mode, the probability of occurrence and the ability to detect it are also determined. FTA uses top-down logic to determine what failures (and in what combinations) can cause an undesirable event to occur. Both are well-known and very old reliability analysis tools. FMEA, for example, is described in US DoD standards dating from 1949.

FMEA is one of the most powerful reliability tools available, **provided that it is used properly**. It is therefore important to briefly highlight a major difference between a Design FMEA and a Logistics FMEA. Many engineers know that FMEA forms part of Logistic Support Analysis (LSA). Typically, in performing a LSA, the product or system Bill of Materials is used to develop a hardware breakdown structure, which forms the basis for listing failure modes. These failure modes are then used to identify logistic support in terms of spare parts, special test equipment and tools, maintenance personnel and documentation. The focus is on how to support the product or system when a failure has occurred. The focus of a design FMEA, on the other hand, is on how to prevent failure from occurring in the first place! It is much more than simply adding the word “failure” to a hardware item, and requires substantial technical input from design engineers. Many companies perform only logistics FMEA, and fail to reap the benefits of this powerful reliability analysis tool during development.

One of the fundamental weaknesses of FMEA results from asking the question “How can this item possibly fail?” Since this is a negative question, it may be difficult to identify all potential failure modes. A design engineer, in particular, may be reluctant to contribute to this process, since nobody is keen to publish a list of design weaknesses! An interesting approach to this problem is to change it into the positive question of “How can I change this design to cause a failure to happen?” In practice, this will immediately help to identify more failure modes, since every design engineer knows exactly how to change a configuration or a part or a parameter into a failure. This approach is known as *Anticipatory Failure Determination*<sup>®</sup>, and is an application of TRIZ (or *Theory of the Solution of Inventive Problems*) on FMEA [1].

Finally, it should be noted that reliability prediction (using the cancelled Mil-Hdbk-217) is not considered a useful reliability engineering analysis tool. This, and other similar reliability prediction methods which attempt to quantify reliability during development, are based on fundamentally flawed assumptions (e.g. Arrhenius equation). They have therefore limited (if any) ability to prevent failures from occurring in the field [2].

[The third and final part of this series will discuss “Test” as verification method in more detail with special reference to HALT and HASS – Editor].

## REFERENCES

[1] <http://www.ideationtriz.com>

[2] RWA Barnard, *What is wrong with Reliability Engineering?*, 18th Annual International Symposium of INCOSE, 15-19 June 2008, Utrecht, The Netherlands

## BIOGRAPHY

Albertyn Barnard received the degrees M Eng (Electronics) and M Eng (Engineering Management) from the University of Pretoria in South Africa. He has provided consulting services in reliability engineering to the defence, nuclear, aerospace and commercial industries since 1982. He provides training in reliability engineering to local industry and at post-graduate level at the University of Pretoria. He has presented numerous technical papers at local and international symposia, and won the Ad Sparrus Best Paper Award at the 2004 INCOSE SA conference, as well as the Gold Award at the 2009 International Applied Reliability Symposium Europe. He has been a member of the management committee of INCOSE SA for a number of years, and served as President of INCOSE SA in 2008. His company, Lambda Consulting, specialises in reliability engineering activities applicable to the development phase of products, with emphasis on reliability analysis of electronic design and HALT (Highly Accelerated Life Testing). Lambda Consulting established the first commercial HALT laboratory in South Africa in 2008.

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## Systems Engineering News

### Artificial Intelligence for Engineering Design, Analysis and Manufacturing (AIEDAM) - Special Issue on Configuration

(Submission Deadline: March 20th 2010)

The goal of this special issue on configuration is to demonstrate novel and innovative configuration research as well as new industrial applications of configuration technologies. We encourage submissions describing novel results involving AI in configuration-related areas, including but not limited to:

- Theoretical issues justified by practical concerns;
- Methods for computing configurations and supporting configuration tasks;
- Methods for effective configuration knowledge base development, testing & debugging;
- Configuration and product/service/software design, product & service lifecycle management, and production management;
- Thorough case studies highlighting new practical problems, needs and experiences;
- Practical and new applications based on a well-defined theory or model.

Also welcome are articles that survey different approaches and thoroughly analyze their differences and commonalities.

[More Information](#)

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### ManTech to Offer Certifications from International Council on Systems Engineering

ManTech International Corporation (Nasdaq:MANT) and the International Council on Systems Engineering (INCOSE) announced that ManTech will offer INCOSE's Certified Systems Engineering Professional (CSEP) program to its employees.

"ManTech is a leader in systems engineering and it is one of the most critical capabilities we provide our customers," said Lawrence B. Prior, III, President and COO, ManTech International Corporation. "CSEP is a widely respected credential and our employees who achieve this certification will enhance their professional development and be able to use their increased skill and knowledge to benefit our customers."

"INCOSE is pleased to enter this agreement with ManTech to advance the practice of systems engineering and to welcome their experts into our certification program. Together, we will build upon INCOSE's CSEP designation as the worldwide reference for systems engineering professionalism," said Pat Hale, President of INCOSE.

[More information](#)

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### INCOSE Election Results

INCOSE is pleased to announce the results of the recent elections and to congratulate the newly elected officers, directors and Member Board representatives.

New officers and directors will be inducted during the International Workshop in February, 2010.

**President-Elect:** John Thomas

**Treasurer:** Marsha Weiskopf

**Director for Communications:** Cecilia Haskins

**Director for Strategy:** Ralf Hartmann

**Member Board Representatives:**

- **Region I:** Robert Scheurer

- **Region II:** Eric Belle

- **Region IV:** Mike Dee

[More information](#)

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## Invitation to SEMAT - The Software Engineering Method and Theory Initiative

By Ivar Jacobson, Bertrand Meyer, Richard Soley

You may have heard that the three of us have been quietly planning a "revolution". The goal is to re-found software engineering as a rigorous discipline. We recognize that the natural tendency in our field is to perturb systems minimally into approximate correctness, but this path cannot be sustained any longer if we are to support the computing industry and help it meet the demands of society. We need to restart on a solid basis, taking advantage of all that has been learned in software engineering theory and practice over the past five decades.

[More information](#)

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## Featured Societies - Association Française d'Ingénierie

### Système (AFIS)

Formed in 1999 by 13 large French enterprises, AFIS is comprised of Members (companies and public enterprises) and individual practitioners. There are today 30 Members and more than 500 individual members.

Working groups, coordinated by the Scientific Council of AFIS, offer practitioners the opportunity to meet and network. They can thus enrich their professional knowledge and in dialogue with their peers in their speciality. The present working groups are:

- Systems Architecture
- System Configuration Management
- Requirements Engineering
- System Engineering
- Integration, Verification, Validation, Qualification
- Control of Work / Master of Work
- Project Management
- Methods and Tools
- Metrics, Competencies, Training
- Maturity Models and Indicators
- Systems Resilience
- Integrated Logistic Support
- Systems of Systems, and Complex Systems.

An annual conference organized by AFIS provides an opportunity for exchange and education, meeting the need of the French systems engineering community.

AFIS is affiliated with INCOSE, with Chapter status, and represents France.

[More information](#)

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## INCOSE Technical Operations

# INCOSE Global Earth Observation System of Systems (GEOSS) Working Group

<http://www.incose.org/practice/techactivities/wg/geoss/>

## Charter

Promote shared understanding and advancement of systems engineering practices and principles in the earth observation community.

## Leadership Roles & Team Members

**INCOSE Representative:** Lawrence McGovern, Northrop Grumman

**Architecture and Data Committee Representative:** Lawrence McGovern, Northrop Grumman

**User Interface Committee Representative:** Lawrence McGovern, Northrop Grumman

**Team Members:** Elizabeth Davies, Northrop Grumman Arthur J. Galloway, PhD, Consultant

For more information on GEOSS, visit the [GEO website](#). Contact [GEOSS Working Group](#) for additional information or to join this group.

## Accomplishments/Products

- Joined GEO as a participating organization in 2005.
- Have completed inputs to AIP1 and 2 and presented final report. See attached report.
- Presented Engineering Final Report for AIP 2 to 80 Ministry representatives from their respective countries in Melbourne, Australia in September 2009.
- Current tasking includes updates to nine Societal Based (SBA) Area View Scenario Viewpoints for Enterprise, Information and Computational views and building of Engineering and Technical Viewpoints for all Nine SBA Scenarios.

INCOSE currently participates on the Architecture and Data Committee and the User Interface Committee of GEOSS and is responsible for the UML Architecture development which was recently modified to include SysML syntax diagrams.

GEOSS Briefing to NDIA Conference on System Engineering – October 2009

 In Microsoft PowerPoint Size: 1.66MB

## GEO Task List – November 2009

- Develop RMP-ODP UML Viewpoints for Engineering and Technical Viewpoints and update Enterprise, Information and Computational viewpoints for all nine SBAs.
- See Final Engineering Report for AIP2 (454kb)

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## Systems Engineering Software Tools News

### Artisan Continues Industry Consolidation with Extessy Merger

Artisan Software Tools, has acquired Extessy, a supplier of development tools and services for system requirements, co-simulation, integration and test, based in Wolfsburg, Germany. Artisan's acquisition of Extessy closely follows its acquisition last month of Brass Bullet, a leading UK systems engineering consultancy.

[More information](#)

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### System Quality Requirements Engineering (SQUARE) Tool

A robust tool to support SQUARE has been developed by a team of Carnegie Mellon Master of Software Engineering students with oversight by Carnegie Mellon University staff within CERT, part of the Software Engineering Institute, and CyLab. The tool, designed for use by stakeholders, requirements engineers, and administrators, aids in all nine steps of SQUARE.

[More information](#)

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## 3SL/Cradle: November 2009 Newsletter

Modeling company Artisan Software Tools has focused on adding model display improvements to its Artisan Studio modeling environment. It has also released a new automated model checker.

<http://www.threesl.com/pages/webletter-November09/index.php>

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# Systems Engineering Books, Reports, Articles and Papers

## Errata

PPI apologises to the authors and to our readers for an error in SyEN#014 released on 25 November 2009.

The authors indicated for the following two books were swopped around by mistake. The correct information is:

## Decision Making in Systems Engineering and Management

By Gregory S. Parnell, Patrick J. Driscoll, Dale L. Henderson

and

## Analytical Methods for Risk Management: A Systems Engineering Perspective

By Paul R. Garvey

The complete references are re-printed below.

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## Decision Making in Systems Engineering and Management

By Gregory S. Parnell, Patrick J. Driscoll, Dale L. Henderson

Publisher's Description: *"This comprehensive textbook provides a logical process for fact-based decision making for the most challenging systems problems. It is composed of three bedrock elements to improve readers' understanding and analysis of the most challenging systems problems that exist today: systems thinking, which identifies important interconnections between a system and its environment; systems engineering, which describes the activities of professional systems engineers; and systems decision making, which provides fact-based information to support major system decisions made at every life cycle stage."*

This hardcover book was published on February 8, 2008 in the Wiley Series in Systems Engineering and Management. ISBN-10: 0470165707, ISBN-13: 978-0470165706

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## Analytical Methods for Risk Management: A Systems Engineering Perspective

By Paul R. Garvey

Publisher's Description: *"A Text on the Foundation Processes, Analytical Principles, and Implementation Practices of Engineering Risk Management"*

*Drawing from the author's many years of hands-on experience in the field, the book presents the foundation processes and analytical practices for identifying, analyzing, measuring, and managing risk in traditional systems, systems-of-systems, and enterprise systems. After an introduction to engineering risk management, the book covers the fundamental axioms and properties of probability as well as key aspects of decision analysis, such as preference theory and risk/utility functions. It concludes with a series of essays on major analytical topics, including how to identify, write, and represent risks; prioritize risks in terms of their potential impacts on a systems project; and monitor progress when mitigating a risk's potential adverse effects. The author also examines technical performance measures and how they can combine into an index to track an engineering system's overall performance risk. In addition, he discusses risk management in the context of engineering complex, large-scale enterprise systems.*

This hardcover book was published on October 20, 2008 by Chapman & Hall/CRC. ISBN-10: 1584886374, ISBN-13: 978-1584886372

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# Handbook of Research on Discrete Event Simulation Environments: Technologies and Applications

By Evon M. O. Abu-taieh, Asim Abdel Rahman El Sheikh

Publisher: Information Science Reference, Publication Date: 2009-10-20

ISBN-10 / ASIN: 1605667749, ISBN-13 / EAN: 9781605667744



## Product Description:

Discrete event simulation environments have desirable features and components now driving researchers to develop and enhance existing environments. The Handbook of Research on Discrete Event Simulation Environments: Technologies and Applications provides a comprehensive overview of theory and practice in simulation systems. A leading publication in this growing field, this Handbook of Research offers researchers, academicians, and practitioners progressive findings in simulation methodologies, modeling, standards, and applications.

[More information](#)

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## Cause-Effect Diagrams: A Pragmatic Way of Doing Root-Cause Analysis

By Henrik Kniberg, Nov 16, 2009

Cause-effect diagrams are a simple and pragmatic way of doing root cause analysis. Henrik Kniberg shows you how cause-effect diagrams work, so you can put them to use in your own context.

[More information](#)

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## UML Profiles Target DODAF, MODAF, SOA and Systems

The Unified Modeling Language (UML) has settled comfortably into its role of pulling together the technologies enterprises used to visually model software. UML has grown to comprise more than just software modeling diagrams. Profiles and specifications exist to expand its capabilities. The language has come to include 14 diagram types and a growing set of profiles.

[More information](#)

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## MV-22, F-35B: Systems Engineering Fail!

There's a new DARPA solicitation out that every MV-22 and JSF advocate must read.

Here's the first paragraph:

*“DARPA is soliciting innovative research proposals in the area of Thermal Management Systems (TMS) for aircraft landing decks. The deployment of the MV-22 Osprey has resulted in ship flight deck buckling that has been attributed to the excessive heat impact from engine exhaust plumes. Navy studies have indicated that repeated deck buckling will likely cause deck failure before planned ship life. With the upcoming deployment of the F-35B Short Take Off and Vertical Landing (STOVL) Joint Strike Fighter (JSF), it is anticipated that the engine exhaust plumes may have a more severe thermo-mechanical impact on the non-skid surface and flight deck structure of ships. Currently, there are no available strategies to mitigate deck buckling and thermal-mechanical deck failure other than heavy structural modifications. The goal of this effort is to exploit thermal management technologies that incorporate a thermally and functionally stable non-skid surface which meets Navy requirements for application, safety, and performance. Eligible technologies should consist of an integrated Thermal Management System (TMS) that mitigates the thermo-mechanical structural impact of the F-35B engine exhaust plumes. It is anticipated that the integrated TMS will be implemented on Navy Landing Helicopter Dock (LHD) 1 and Landing Helicopter Assault (LHA) 6 Class amphibious assault ships.”*

[More information](#)

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## Life Cycle of a Silver Bullet

Sarah A. Sheard, Software Productivity Consortium

"Attention! Throw out those other improvement methods - we have just discovered the best ever. With our method, your quality will go up and costs and cycle time will go down." Almost any improvement method is hailed as the best way to save business from problems when it is new. Unfortunately, a few years later, this same method is now the reviled, flawed method that a new method is replacing. This parable tells how this happens.

[More information](#)

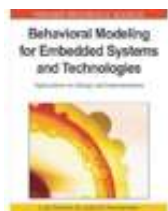
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## Behavioral Modeling for Embedded Systems and Technologies: Applications for Design and Implementation

by Luís Gomes and João M. Fernandes

Publisher: Information Science Reference (July 16, 2009)

ISBN-10: 1605667501, ISBN-13: 978-1605667508



### Product Description:

The development of embedded systems offers a higher degree of abstraction, crucial to tackling the growing complexity and usage of model-driven approaches.

Behavioral Modeling for Embedded Systems and Technologies: Applications for Design and Implementation provides an overview of innovative behavior models currently used for developing embedded systems, accentuating graphical and visual notations. This dynamic compilation presents an authoritative reference collection to the most significant models of computation currently in use for embedded systems design.

[More information](#)

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## Call for Papers: ACM Transactions on Autonomous and Adaptive Systems Special Issue on: Pervasive Adaptation: Visions & Challenges

Pervasive Adaptation is concerned with models, tools, and technologies to be used in pervasive information and communication systems that are capable of autonomously adapting to highly dynamic contexts. The successful development of future pervasive systems will increasingly require handling complex interactions between intelligent objects, computers, sensors and actuators, and intelligent objects of any kind. The real challenge is to make such interactions fruitful, purposeful, and secure, despite the constantly changing characteristics of the environment (whether social, physical, or technical) in which such systems will operate, in the absence of any centralized control, and possibly even in the absence of a complete understanding of the structure and micro-level functioning of these systems. Clearly, the only way to approach this is to make systems able to adapt themselves (at the level of individual components or at the collective level) over situations and time, taking into account the overall emergent behavior of the system, and possibly offensively exploit the context dynamics to improve and evolve.

This special issues welcomes submissions on any topic related to pervasive adaptation. Survey/tutorial papers focusing on a specific topic of pervasive adaptation and aimed at framing the key concepts, challenges, and related work on that topic, are particularly welcome. Technical papers describing some original technical contribution are equally welcomed, provided they contain enough introductory/survey material to make the paper of general interest behind its specific technical contribution.

[More information](#)

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## Human Factors in Requirements Engineering: - A Survey of Human Sciences Literature Relevant To the Improvement of Dependable Systems Development Processes

Authors: Stephan Viller, John Bowers, Tom Rodden

**Abstract:**

Requirements engineering (RE) is an inherently social process, involving the contribution of individuals working in an organizational context. Further, failures in the RE process will potentially lead to systematic failures in the products that are produced as a result. Consequently, the RE process for dependable systems development should itself be considered as a dependable process, and therefore subject to greater scrutiny for vulnerabilities to error. Research on human error has typically focused on the work of individual actors from a cognitive perspective. This paper presents a survey which broadens the view on what contributes to human error by also examining work from the social and organizational literature. This review was conducted to inform efforts to improve the systems development process for dependable systems, and in particular their requirements engineering process.

[More information](#)

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## Managing Legal Texts in Requirements Engineering

Authors: Paul N. Otto, Annie I. Antón

### Abstract:

Laws and regulations are playing an increasingly important role in requirements engineering and systems development. Monitoring systems for requirements and policy compliance has been recognized in the requirements engineering community as a key area for research. Similarly, legal compliance is critical in systems development, especially given that non-compliance can result in both financial and criminal penalties. Working with legal texts can be very challenging, however, because they contain numerous ambiguities, cross-references, domain-specific definitions, and acronyms, and are frequently amended via new statutes, regulations, and case law. Requirements engineers and compliance auditors must be able to identify relevant legal texts, extract requirements and other key concepts, and monitor compliance. This chapter surveys research efforts over the past 50 years in handling legal texts for systems development. This survey can aid requirements engineers and auditors to better specify, test, and monitor systems for compliance.

[More information](#)

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## Change Impact Analysis for SysML Requirements Models based on Semantics of Trace Relations

Authors: ten Hove, D.; Göknil, A.; Kurtev, I.; van den Berg, K.G.; de Goede, K.  
Editors Oldevik, J.; Olsen, G. K.; Neple, T.; Kolovos, D.

### Summary:

Change impact analysis is one of the applications of requirements traceability in software engineering community. In this paper, we focus on requirements and requirements relations from traceability perspective. We provide formal definitions of the requirements relations in SysML for change impact analysis. Our approach aims at keeping the model synchronized with what stakeholders want to be modeled, and possibly implemented as well, which we called as the domain. The differences between the domain and model are defined as external inconsistencies. The inconsistencies are propagated for the whole model by using the formalization of relations, and mapped to proposed model changes. We provide tool support which is a plug-in of the commercial visual software modeler Blueprint.

[More information](#)

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## Standard High Level Modelling Language Aids Safety Systems

Matthew Hause looks at how a standard high level modelling language can help in the design and development of mission critical systems as they become standardised.

[More information](#)

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## The Systems Engineering Delusion

*“...The need for complex interaction between different specialists is not a new economic phenomenon, and in engineering it does indeed require project managers and technical directors who can take a multi-disciplinary overview. This, however, is quite distinct from the Systems Engineering ethos, which attempts to legitimise the creation of a separate discipline which specialises in the top-down analysis of engineering projects in terms of requirements, capabilities and stakeholders, abstracted from concrete engineering issues.”*

[More information](#)

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# Conferences and Meetings

## **INCOSE 2010 International Workshop**

7 - 10 February, 2010. Phoenix Marriott Mesa, Mesa, Arizona.

[More information](#)

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## **Semantic Models for Adaptive Interactive Systems**

In conjunction with 2010 International Conference on Intelligent User Interfaces (IUI 2010) in Hong Kong, China, on February 7th, 2010

[More information](#)

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## **1st Workshop on Semantically-Enabled Systems Engineering (SENSE-2010)**

15 - 18 February, 2010. Andrzej Frycz Modrzewsk Cracow College, Krakow, Poland.

[More information](#)

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## **IESS 1.0: First International Conference on Exploring Services Sciences**

17 - 19 February, 2010. Geneva, Switzerland.

[More information](#)

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## **The 1st Workshop on Model Based Engineering for Embedded Systems Design**

March 12, 2010 - Dresden, Germany

[More information](#)

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## **CSER 2010 8th Annual Conference on Systems Engineering Research**

17-19 March, Honoken, NJ, USA

[More information](#)

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## **The 2010 International Symposium on Collaborative Technologies and Systems (CTS 2010)**

May 17-21, 2010, The Westin Lombard Yorktown Center, Chicago, Illinois, USA

[More information](#)

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## **Lean Software & Systems Conference 2010**

April 21-23, 2010, Atlanta

[More information](#)

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## **7th Workshop on System Testing and Validation (STV10)**

In conjunction with IEEE ECBS 2010, Oxford, UK

March 22-26, 2010

[More information](#)

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## **Track on REAL-TIME SYSTEMS at ACM SAC 2010**

21 - 26 March, 2010. Sierre, Switzerland.

[More information](#)

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## Quality of Model-Based Testing (QuoMBaT 2010)

April 10, 2010. Paris, France

[More information](#)

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## CHI 2010 (ACM Conference on Human Factors in Computing Systems)

10 – 15 April 2010, Atlanta, GA, USA

[More information](#)

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## 5th International Workshop on Model-Driven Development of Advanced User Experience and UI Engineering

Organised at CHI 2010

10 – 15 April 2010, Atlanta, GA, USA

[More information](#)

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## The Third Edition of the Requirements Engineering Track (RE-Track'10)

22 - 26 March, 2010. Sierre, Switzerland.

[More information](#)

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## Symposium On Theory of Modeling and Simulation - DEVS Integrative M&S Symposium (DEVs'10)

April 11 - 15, as part of the 2010 [Spring Simulation Multiconference](#) at the [Florida Mall Hotel and Conference Center](#) in [Orlando](#), FL, USA

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## WER'10: 13th Workshop on Requirements Engineering

April 12-13, 2010 - Cuenca, Ecuador

[More Information](#)

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## Agent-Directed Simulation Symposium (ADS 2010)

12 - 15 April, 2010, Orlando, Florida, USA.

[More information](#)

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## Second NASA Formal Methods Symposium (NFM 2010)

April 13 - 15, 2010, USA

[More information](#)

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## COFES: Congress on the Future of Engineering Software (COFES) 2010

15 - 18 April, 2010, Scottsdale, Arizona, USA.

[More information](#)

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## 2010 The 2nd IEEE International Conference on Systems Engineering and Modeling (ICSEM 2010)

23 to 25 April 2010, Bangkok, Thailand

[More information](#)

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## 22nd Annual Systems & Software Technology Conference (SSTC 2010)

26-29 April 2010, Salt Palace Convention Center, Salt Lake City, Utah

[More information](#)

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## **Systems Engineering and Test Evaluation (SETE) 2010**

3 - 6 May, 2010, Stamford Grand, Adelaide.

[More information](#)

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## **Software Process Improvement and Capability Determination (SPICE) 2010**

18-20 May 2010 - Pisa, Italy

[More information](#)

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## **EuSEC 2010: Systems Engineering and Innovation**

23 - 26 May, 2010, Stockholm, Sweden.

[More information](#)

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## **The 22nd International Conference on Advanced Information Systems Engineering (CAiSE'10)**

07-11 June 2010, Hammamet, Tunisia

[More information](#)

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## **21st IEEE International Symposium on Rapid System Prototyping**

June 8-11, 2010, George Mason University, Fairfax, Virginia, USA

[More information](#)

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## **PETRI NETS 2010**

21-25 June, 2010, Braga, Portugal

[More information](#)

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## **ACSD 2010: 10th International Conference on Application of Concurrency to System Design**

Collocated with Petri Nets 2010

June 21-25, 2010, Braga, Portugal

[More information](#)

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## **ISARCS 2010 - 1st International Symposium on Architecting Critical Systems Federated with CompArch 2010**

June 23-25 2010 Prague, Czech Republic

[More information](#)

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## **16th International Working Conference on Requirements Engineering: Foundation for Software Quality (RefsQ 2010) NEW**

30 June – 2 July, 2010, Essen, Germany

[More information](#)

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## **20th Annual INCOSE International Symposium (IS10)**

11 - 15 July, 2010, Rosemont, IL, USA.

[More information](#)

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## 2nd International Workshop on Model-Driven User-Centric Design & Engineering (MDUCDE'10)



September 1st & 2nd, 2010, Valenciennes/France

[More information](#)

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## European Systems & Software Process Improvement and Innovation

1-3 September 2010, Grenoble Institute of Technology, France

[More information](#)

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## The 18th International Requirements Engineering Conference (RE 2010)

Sep 27, 2010 - Oct 1, 2010, Sydney, Australia

[More information](#)

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## Fifth International Conference on Graph Transformation

27 September - 2 October, 2010. University Of Twente, Enschede, The Netherlands

[More information](#)

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## Fourth Asia-Pacific Conference on Systems Engineering (APCOSE 2010)

4 - 6 October, 2010. Keelung, Taiwan.

[More information](#)

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## Sixth Nordic Conference on Human-Computer Interaction (NordiCHI 2010)

October 16 – 20, Reykjavik Iceland

[More information](#)

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## Complex Systems Design & Management 2010

October 27-29, 2010, Paris, France

[More Information](#)

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## 2010 IITA International Conference on Control, Automation and Systems Engineering (CASE 2010)



Nov 7, 2010 - Nov 8, 2010. Taipei, Taiwan

[More information](#)

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## ICECSE 2011 "International Conference on Electrical, Computer and Systems Engineering"

January 25-27, 2011, Dubai, United Arab Emirates

[More information](#)

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## Education & Academia

### Accelerated Master's Program Aims to Provide Affordable Education, Career Training to Veterans in Only One Year

Tom Christensen, Cavalier Daily Associate Editor

The University of Virginia's Department of Systems and Information Engineering has developed an Accelerated Master's

Program in systems engineering designed specifically for providing United States Veterans with inexpensive career and educational training.

[More information](#)

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## New Certificate Programs Offered at Eastern Oregon University

Eastern Oregon University is hoping to open the door to high-demand careers in computer programming, web design and health care through a series of new certificate programs available beginning winter term.....

Certificates in Computer Programming, Web Development, **Systems Engineering**, Intermediate Computer Programming and Spanish for Healthcare Professionals are the outcome of those meetings.

[More information](#)

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## Some Systems Engineering-Relevant Websites

### INCOSE Chapter Websites

AFIS (Association Française d'Ingénierie Système), France Affiliate

[www.afis.fr](http://www.afis.fr)

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Alamo

[www.incose.org/alamo/](http://www.incose.org/alamo/)

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Atlanta

[www.incose.org/atlanta/](http://www.incose.org/atlanta/)

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Australia

[www.seecforum.unisa.edu.au/incose/incose-oz.html](http://www.seecforum.unisa.edu.au/incose/incose-oz.html)

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Central Arizona (Phoenix, AZ)

[www.incose.org/cazcc/](http://www.incose.org/cazcc/)

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Central Florida (Tampa Bay area, FL)

[www.cfincose.shorturl.com](http://www.cfincose.shorturl.com)

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Central Savannah River Area (Aiken, SC)

[www.incose.org/csra/](http://www.incose.org/csra/)

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Central Virginia (Fredericksburg, VA)

[www.incose.org/cva/](http://www.incose.org/cva/)

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Chesapeake (Columbia, MD)

[www.incose.org/chesapek/](http://www.incose.org/chesapek/)

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Cleveland-Northern Ohio

[www.incose.org/cleveland/](http://www.incose.org/cleveland/)

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Colorado Front Range (Metropolitan Denver Area, CO)

[www.incoseco.org](http://www.incoseco.org)

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Crossroads of America (IN/IL)



[www.incose-coa.org](http://www.incose-coa.org)

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Delaware Valley (Philadelphia, PA; PA/NJ)

[www.incose.org/delvalley/](http://www.incose.org/delvalley/)

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Michigan (Detroit, MI)

[www.incose.org/michigan/](http://www.incose.org/michigan/)

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Emerald Coast (Florida panhandle)

[www.incose.org/enchantment/](http://www.incose.org/enchantment/)

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Enchantment (Albuquerque, NM)

[www.incose.org/enchantment/](http://www.incose.org/enchantment/)

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Finger Lakes (Rochester, NY and environs)

[www.incose.org/flc/](http://www.incose.org/flc/)

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FINSE (Finnish System Engineering) Chapter

[www.finse.org](http://www.finse.org)

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Gesellschaft für Systems Engineering, e.V. (German Chapter)

[www.gfse.de](http://www.gfse.de)

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Hampton Roads Area (Hampton Roads, VA)

[www.incose.org/hra](http://www.incose.org/hra)

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Heartland (Cedar Rapids, IA)

[www.incose.org/heartld/](http://www.incose.org/heartld/)

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Huntsville (Huntsville, AL)

[www.incose.org/huntsville/](http://www.incose.org/huntsville/)

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India

[www.incose.org/india/](http://www.incose.org/india/)

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Israel

[www.iltam.org/scope/incose.html](http://www.iltam.org/scope/incose.html)

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Istanbul

[www.incoseistanbul.org](http://www.incoseistanbul.org)

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Japan

[www.incose.org/japan/](http://www.incose.org/japan/)

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Liberty (Whippany, NJ)

[www.incose.org/liberty/](http://www.incose.org/liberty/)

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Los Angeles (Los Angeles, CA)

[www.incose-la.org](http://www.incose-la.org)

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Midwest Gateway (St. Louis, MO)

[www.incose.org/mdwest/](http://www.incose.org/mdwest/)

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New England (Boston, MA)  
[www.incose-ne.org](http://www.incose-ne.org)

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North Star (Twin Cities, MN)  
[www.incose.org/northstar/](http://www.incose.org/northstar/)

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North Texas (Dallas, TX)  
[www.incose.org/ntexas/](http://www.incose.org/ntexas/)

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Norwegian Systems Engineering Council (Norwegian Chapter of INCOSE)  
[www.norsec1.no](http://www.norsec1.no)

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Orlando (Orlando, FL)  
[www.incose.org/orlando/](http://www.incose.org/orlando/)

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San Diego (San Diego, CA)  
[www.sdincose.org](http://www.sdincose.org)

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San Francisco Bay Area (Silicon Valley, CA)  
[www.incose.org/sfbac/](http://www.incose.org/sfbac/)

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Seattle Metropolitan (Seattle, WA)  
[www.incose.org/smc/](http://www.incose.org/smc/)

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Singapore  
[www.incose.org/singapore/](http://www.incose.org/singapore/)

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Silver State (Las Vegas, NV)  
[www.lvrj.com/communitylink/incose/](http://www.lvrj.com/communitylink/incose/)

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Snake River (ID)  
[www.incose-snakeriver.org/](http://www.incose-snakeriver.org/)

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Space Coast (Melbourne, FL)  
[www.incose-scc.org](http://www.incose-scc.org)

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Southern Maryland (Patuxent River, MD)  
[www.incose.org/so-md/](http://www.incose.org/so-md/)

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South Africa  
[www.incose.org.za](http://www.incose.org.za)

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Southern Ontario  
[www.incose-soc.org](http://www.incose-soc.org)

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Swedish Chapter  
[www.incose.org/sweden/](http://www.incose.org/sweden/)

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Taiwan  
[www.cast.itri.org.tw/Incose-Taiwan/](http://www.cast.itri.org.tw/Incose-Taiwan/)

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The Netherlands (Northwest Europe)

[www.incose.nl](http://www.incose.nl)

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Texas Gulf Coast

[www.incose.org/tgcc/](http://www.incose.org/tgcc/)

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Tri-Cities (Richland, WA)

[www.incose.org/tri/](http://www.incose.org/tri/)

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United Kingdom

[www.incoseonline.org.uk](http://www.incoseonline.org.uk)

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Washington Metropolitan Area (Washington, DC)

[www.incose-wma.org](http://www.incose-wma.org)

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## Standards and Guides

### ISO/IEC/IEEE 12207 and 15288: The Entry-Level Standards for Process Definition - Part 1

James W. Moore

In 2008, the 12207 standard for software life cycle processes and the 15288 standard for system life cycle processes were revised in an effort that finally harmonized system and software processes as well as bringing the respective IEEE and ISO/IEC standards into complete agreement. Some users mistakenly believe that these standards are targeted only to large organizations able to make a substantial investment in a complete suite of software and systems processes. However, these standards are also the best entry point for beginning users who desire guidance on as few as a single process. This three-part article will explain how entry-level users can apply the two standards.

[More information](#)

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## Project Performance International News

### PPI Releases 2011 Public Course Schedule

Needing to plan or budget well ahead? PPI's 2011 worldwide public course schedule is now accessible. Go to <http://www.ppi-int.com/course-schedule.php>

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### A Systems Approach to Love, Life and Business

On 12 November 2009, Robert Halligan, MD of Project Performance International, presented at the INCOSE Western Cape Chapter (South Africa) end of year event. His subject was "A Systems Approach to Love, Life and Business". The presentation is downloadable from: <http://www.incose.org.za>

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## Project Performance International Events

### Systems Engineering 5-Day Courses

Upcoming locations include:

- Singapore
- Amsterdam, The Netherlands

- Melbourne, Australia
- La Spezia, Italy
- London, UK
- Pretoria

[View 2009/2010 Systems Engineering Course Schedule](#)

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## Requirements Analysis and Specification Writing 5-Day Courses

Upcoming locations include:

- Amsterdam, The Netherlands
- Las Vegas, USA
- Melbourne, Australia
- Cape Town, South Africa

[View 2010 RA&SW Course Schedule](#)

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## OCD/CONOPS 5-Day Courses

Upcoming locations include:

- Las Vegas, USA
- Pretoria, South Africa
- Adelaide, Australia

[View 2010 OCD/CONOPS Course Schedule](#)

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## Software Engineering 5-Day Courses

Upcoming locations include:

- Amsterdam, The Netherlands
- Melbourne, Australia
- Pretoria, South Africa
- Las Vegas, USA

[View 2010 Software Engineering Course Schedule](#)

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## Cognitive Systems Engineering 5-Day Courses

Upcoming locations include:

- Melbourne, Australia
- London, UK
- Las Vegas, USA
- Adelaide, Australia

[View 2010 Cognitive Systems Engineering Course Schedule](#)

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## PPI Upcoming Participation in Professional Conferences

- May 3 - 6, 2010 - **SETE 2010** - Adelaide, SA, Australia (Sponsor/Exhibiting)
  - May 23 - 26, 2010 - **EuSEC 2010** - Stockholm, Sweden (Sponsor)
  - July 12 - 15, 2010 - **INCOSE International Symposium 2010 (IS10)** - Chicago, IL, USA (Sponsor/Exhibiting)
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