



INCOSE 2002

LAS VEGAS, NEVADA
28 JULY - 1 AUGUST



12TH ANNUAL INTERNATIONAL SYMPOSIUM

INTERNATIONAL COUNCIL ON
SYSTEMS ENGINEERING

HOSTED BY:
INCOSE REGION II CHAPTERS
SOUTHWESTERN USA

ENGINEERING 21ST CENTURY SYSTEMS:

PROBLEM SOLVING THROUGH STRUCTURED THINKING

For changes to the Technical Program since the brochure was published see the Symposium Program at http://incose.org/symp2002/program/symposium_program.xls



THE RIVIERA HOTEL • 28 JULY - 1 AUGUST, 2002
LAS VEGAS • NEVADA

PROGRAM BROCHURE SPONSORED BY: **TRW**

EXHIBITORS-TO-DATE

The Aerospace Corporation
 BAE SYSTEMS
 Compliance Automation, Inc.
 EDS PLM Solutions
 General Dynamics
 I-Logix, Inc.
 INCOSE 2003
 INCOSE Central
 Integrated System Diagnostics
 James Gregory Associates, Inc.
 Oculus Technologies Corporation

Predicate Logic Inc.
 Software Engineering Institute
 Software Technology Conference
 Sterling Technologies, Inc.
 TRW Inc.
 United Defense, L.P.
 US Army Information Systems
 Engineering Command
 US Dept. of Energy,
 Yucca Mtn. Site Characterization Project
 Vitech Corporation

For Exhibit information and opportunities,
 please contact: Tom Kudlick at SynchroCubed@aol.com
 or see the INCOSE Symposium website at www.incose.org/symp2002.



INCOSE 2002 SYMPOSIUM PLANNING COMMITTEE:

General Chair	Kevin Harbert	Bechtel SAIC Company, LLC	Silver State Chapter
Deputy General Chair	Ralph S. Hill III	Golder Associates, Inc.	Silver State Chapter
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	Herman Migliore	Portland State University	
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Events	James Harper	Golder Associates, Inc.	Silver State Chapter
Tutorials	Shirlee Flowers	TRW Inc., Missile Defense Division	Inland Empire Chapter
Webmaster	Steve Recker	The Boeing Company	

MARK YOUR CALENDAR!

2003 INCOSE INTERNATIONAL SYMPOSIUM: ENGINEERING TOMORROW'S WORLD TODAY!

Thirteenth Annual International Symposium of The International Council on Systems Engineering
 Hosted by the INCOSE Region IV Chapters
 Hyatt Regency Crystal City, Virginia

29 JUNE – 3 JULY 2003 • WASHINGTON, DC

IMPORTANT DATES: Call for Tutorials Submission Deadline: 14 October 2002
 Call for Papers Submission Deadline: 1 November 2002
 Call for Panels Submission Deadline: 4 December 2002

For more information and regular program updates, please visit the INCOSE 2003 booth in Las Vegas,
 or refer to the INCOSE website at www.incose.org after INCOSE 2002.

WELCOME TO THE 2002 INCOSE INTERNATIONAL SYMPOSIUM!



Dear Colleagues,

This year's Symposium theme is **Engineering 21st Century Systems: Problem Solving Through Structured Thinking**. INCOSE is becoming a closely-knit world community. It is important that we continue the process of sharing the information needed to solve the unique and difficult problems facing us in the 21st Century. To help accomplish this, we have 19 tutorials, more than 10 provocative international panels and over 130 technical papers being presented on systems engineering process improvements and systems engineering applications. Topical areas include requirements, risk, modeling, metrics, system architecting, enterprise systems, internet, transportation, space, environment, and anti-terrorism.

This combination allows you to learn from many systems engineering experts and I am confident that you will be eager to share and spread new knowledge and experience within your company and with your fellow employees. By sharing, INCOSE will continue to provide improvement activities, to expand these activities and to make them increasingly accessible to the worldwide work force.

I look forward to sharing the INCOSE experience with you in Las Vegas.

John R. Snoderly
INCOSE President
Defense Acquisition University

Dear Colleagues,

The Region II Chapters (Southwestern United States) of INCOSE invite you to join us this summer in Las Vegas, Nevada, USA to participate in the 12th Annual INCOSE International Symposium. We will be investigating issues, challenges, and solutions to *Engineering 21st Century Systems: Problem Solving Through Structured Thinking*. The figure in the INCOSE 2002 logo is Kokopelli, whose profile appears in petroglyphs and pottery throughout the Southwestern United States, including Southern Nevada. In ancient Native American legend, Kokopelli the flute player was a symbol of happiness and joy. He was also thought of as a fertility god and traveling prankster. So in the spirit of Kokopelli, may your attendance at INCOSE 2002 be both **productive** and **enjoyable**!

Kevin R. Harbert
INCOSE 2002 General Chair
Bechtel SAIC Company, LLC

MESSAGE FROM THE TECHNICAL CHAIR OF THE INCOSE 2002 SYMPOSIUM

Dear Colleagues,

In the first years of this new century, we continue to discover new problems and challenges to which systems engineering and systems thinking offer promising approaches. From re-engineering our infrastructure systems to resist terrorism, to enabling our organizations to cope with ever-faster economic expansions and contractions, the need to understand and engineer the larger system-of-systems as well as individual systems continues to become more apparent.

The need to keep pace with the changes in systems approaches, methods, techniques, technology, and the environment has never been greater. Yet, too often we are so busy within our own organizations that we don't make time to look at what is going on in industry and the world around us.

I encourage you to come to the 12th Annual INCOSE Symposium. This Symposium, in a few short days, offers you an unparalleled opportunity to get a quick but comprehensive update on the art and practice of systems engineering. The Symposium offers many diverse opportunities including tutorials, keynote presentations, the academic forum, paper presentations, panel discussions and debates, working group sessions, and exhibits. The theme of this year's INCOSE Symposium is *Engineering 21st Century Systems: Problem Solving Through Structured Thinking*. We believe we have assembled an impressive collection of information and resources for you to hone your own knowledge and insights, so you can be a successful participant in the engineering of 21st Century Systems. In addition, this event offers you a unique opportunity to meet and network with the world's leading systems engineering practitioners, managers, and innovators.

Please join us in Las Vegas for this year's premiere INCOSE event.

Dorothy McKinney
Director, San Francisco Bay Area Chapter of INCOSE
Lockheed Martin Space Systems Company – Missiles & Space Operation

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OPENING KEYNOTE SPEAKER

MARGARET S. (PEG) BILLSON

CHIEF TECHNOLOGY OFFICER OF HONEYWELL AEROSPACE, PHOENIX, AZ

Peg Billson is Vice President of Engineering, Technology & Program Management for Honeywell Aerospace and Honeywell Engines, Systems & Services (ES&S). Appointed to this position in April 1999, Peg is responsible for ES&S's engineering resources, processes and results. She also serves as the process excellence leader for technology issues across the \$10 billion Honeywell Aerospace business.

Peg, a staunch advocate of using systems engineering principles, helped ES&S's broad product line uniquely position itself to integrate systems on an aircraft, reducing weight and life cycle costs, while improving reliability.

With a focus on providing innovative solutions and advanced technologies for the aerospace industry, ES&S designs and manufactures small gas turbine engines for business, regional, commercial, military, industrial and marine applications. The company is a leading supplier of auxiliary power units for commercial/regional airlines, business and military aircraft, and produces an extensive range of aerospace systems

and components, including environmental control systems, power generation systems and engine controls.

Before coming to Honeywell in 1997, Peg was with McDonnell Douglas Corporation in Long Beach, California, where she most recently served as Vice President of MD-11, MD-80 and MD-90 programs. In that capacity, she was responsible for all aspects of designing, building and servicing Douglas Aircraft Company products in production at that time and for ensuring that those products and services met customers' expectations.

Peg holds a Bachelor of Science degree from Embry-Riddle Aeronautical University and a Master of Science degree in aerospace engineering from California State University at Long Beach. She has published papers and a thesis in computational fluid dynamics and holds a private pilot's license with a multi-engine rating.



WEDNESDAY PLENARY PRESENTATION

VIRGINIA DUNSTONE

PRESIDENT OF LIFE ENHANCEMENT INSTITUTE, RENO, NV

Virginia Dunstone is a private practice therapist, national speaker to corporations and associations, and noted author and lecturer. She is the designer and developer of **LifeScripting™** which is the unique approach to individual and group counseling. Virginia has implemented LifeScripting in women's prisons, in which the inmates experience major life changes that have greatly reduced the recidivism rate.

Virginia speaks extensively at conferences sponsored by U.S. Senators and Governors and is frequently interviewed on radio and television. She has designed and recorded an audio tape series entitled *The Psychology of Living*. Virginia has also authored a life-altering book entitled *Why Do I Do What I Do?* In this book, the principles of LifeScripting are presented so each reader can answer the "why" questions of life and learn to reframe life experiences for greater personal success.

Recently, Virginia has designed a revolutionary new approach to enhance human performance called **Psycho-Neurology®**. This process utilizes the latest discoveries in the areas of kinesiology, neurology,

and psychology and enables individuals to transform their attitudes and behavior, particularly in relation to stress, fears, phobias, addictions, relationships, and personal prosperity.

Virginia has a B.A. Degree in Psychology and a Masters in Counseling. Both were obtained with honors from the University of Nevada, Las Vegas. She is a former college instructor and regularly trains other therapists in her advanced techniques.



CLOSING DAY PLENARY SPEAKER

KEN SALTER

EXECUTIVE DIRECTOR OF SYSTEMS ENGINEERING AT

WALT DISNEY IMAGINEERING

Ken has a BS in Mechanical Engineering from UC Berkeley and a MS in Mechanical Engineering from UCLA. He began his career at Hughes Aircraft Company, Space and Communications Group where he worked in the Systems Engineering Laboratory. In 1990, Ken moved to Imagineering where he has worked in the Show-Ride Engineering directorate. Ken has worked as a project engineer, a principal engineer for advanced ride concepts, technical director for location-based entertainment, and technical director for a new theme park in Paris. In July 1999, Ken began developing a systems engineering process, based on EIA-632, which is tailored for development of Disney attractions.



VIDEO SPONSORED BY TRW, INC.

DR. SIMON RAMO

Dr. Simon Ramo, a co-founder and “R” of TRW, Inc., long retired but perpetually active, has honored us with a taped interview conducted by Dr. Robin St. Clair, Program Manager at TRW. In addition to being a pioneer of systems engineering, Dr. Ramo was a pioneer of microwave electricity, the electron microscope, Intercontinental Ballistic Missile Systems, and computer control systems. Dr. Ramo’s career also has been on the forefront of American technology development at General Electric and Hughes Aircraft Company. Dr. Ramo has authored numerous books and received many awards including the Presidential Medal of Freedom, the United States’ highest award to a civilian and Dr. Ramo was the first recipient of INCOSE’s Pioneer Award. Dr. Ramo will speak to the 2002 Symposium theme with observations on “What’s Ahead for Systems Engineering,” “Defining the Problem,” and “Predictions.” A brief excerpt of Dr. Ramo’s remarks will be presented during the Opening Plenary Session Tuesday, with a Thursday morning session presentation and discussion of additional remarks, facilitated by Dr. Robin St. Clair.

SYSTEMS ENGINEERING FUNDAMENTALS TUTORIAL

SUNDAY, 1300-1700

NEW THIS YEAR!! FREE OF CHARGE!

Presented by: Cihan H. Dagli, *Director of Systems Engineering Program, University of Missouri-Rolla*
Elliot Axelband, *Director of Systems Engineering Program, University of So. California*

The focus of this tutorial is to introduce Systems Engineering basics to beginning systems engineers and professionals who are interested to know more about Systems Engineering. The following topics will be covered: Systems Engineering Process, Requirements and Functional Analysis, Configuration Management, Trade Studies, Modeling and Simulation, Metrics, Risk Management, Systems Engineering Planning, Organizing and Managing.

OPENING ICE BREAKER RECEPTION

MONDAY, 1800-2000

PRIZES AWARDED FOR THE CRAZY SHIRT CONTEST!

Join in the fun of the opening *Ice Breaker Reception* and compete for prizes in the process! Just wear your **funniest, loudest, most outlandish casual shirt and/or tie** to the reception! Anonymous judges will be roaming the reception looking for the real party animals! Prizes will be awarded for humor, nostalgia, and just plain bad taste!

Brought back a shirt from your trip to Hawaii and haven’t had an occasion to wear it again? Just can’t part with that bowling shirt hanging in the attic? What about that *Staying Alive* polyester beauty you wore – once? Anything qualifies, as long as it brings a smile to the judges’ faces!

So come on all you lounge lizards! Join in the festivities and break the ice with your craziest shirt or tie! You’re bound to have a blast, and could end up a prize winner!

RECEPTION AND BANQUET

WEDNESDAY, 1800-2130

Reception, banquet food and entertainment will be Las Vegas-style for the family!!

EXHIBIT HOURS

1800 - 2000	Monday
1030 - 1800	Tuesday
0900 - 1700	Wednesday
1000 - 1400	Thursday





TECHNICAL PROGRAM SCHEDULE AND ACADEMIC FORUM

SUNDAY, 28 JULY

- 0700-1700 **Symposium Registration**
OPTIONAL TUTORIALS
Refer to www.incose.org/symp2002/tutorials/tutorials.htm
for details about each Tutorial.
- 0800-1700 **Tutorial F00 Competitive Systems Engineering: How to Do Systems Engineering in Hot Competition. Detailed Pragmatic and Unconventional Techniques**
Thomas Gilb, *Result Planning Limited*
- 1300-1700 **Tutorial H00 Systems Engineering Fundamentals (No Fee Afternoon Tutorial – Pre-Registration Required)**
Cihan H. Dagli, *University of Missouri-Rolla*
Elliot Axelband, *University of Southern California*

MONDAY, 29 JULY

- 0700-1700 **Symposium Registration**
OPTIONAL FULL DAY TUTORIALS
Refer to www.incose.org/symp2002/tutorials/tutorials.htm
for details about each Tutorial.
- Tutorial F01 Maximizing the Systems Aspect of SE**
Brian W. Mar, *University of Washington*
Bernard G. Morais, *Synergistic Applications, Inc.*
- Tutorial F02 Managing Requirements**
Ivy Hooks, *Compliance Automation, Inc.*
- Tutorial F03 Process Modeling in a Systems Engineering Context**
Tyson R. Browning, *Lockheed Martin Aeronautics Company*
Ernst Fricke, *Cargolifter Development GmbH*
Herbert Negele, *BMW Group*
- Tutorial F04 Grand Systems Verification**
Jeff Grady, *JOG System Engineering, Inc.*
- Tutorial F05 Fault Analysis for Systems Engineers**
Ronald S. Carson, *The Boeing Company*
- Tutorial F06 OT&E: Validating the Users' Need**
Michael Harris, *University of South Australia*
- Tutorial F07 Essential Principals and Processes for Systems Engineering** **CANCELLED**
~~Richard M. Harwell, *SYSTEM Perspectives*~~
- Tutorial F08 Requirements & Modeling: A Structured Approach**
James N. Martin, *The Aerospace Corporation*
Steven Heidorn, *The Aerospace Corporation*
- Tutorial F09 Applied Statistical Decision Theory for System Engineering**
Mark Powell, *University of Idaho at Idaho Falls*
- Tutorial F10 Knowledge Engineering for Systems Engineering**
John Velman, *Independent Consultant*
- Tutorial F11 System Safety for Systems Engineers**
Mark Ekman, *Sandia National Laboratories*
Paul Werner, *Sandia National Laboratories*
- 0800-1200 **OPTIONAL HALF-DAY (MORNING) TUTORIALS**
- Tutorial H01 Leveraging Six Sigma In Systems Engineering**
Jeannine M. Sivy, *Software Engineering Institute*
M. Lynn Penn, *Lockheed Martin Management & Data Systems*
- Tutorial H02 Making Systems Engineering Intelligent**
Jack Ring, *Innovation Management*
Wayne Wymore, *University of Arizona*
Allen Fairbairn, *Elipsis Limited*
- Tutorial H03 Applying Decision Analysis Techniques to Risky Decisions**
Michael Whitehorne, *TRW*

INCOSE 2002 ACADEMIC FORUM

ENGINEERING 21ST CENTURY SYSTEMS: CURRICULUM CHANGES AND NEW APPROACHES

MONDAY, 29 JULY

TO BE HELD AT
THE TOP OF

THE RIVIERA HOTEL

- ◆ What will Systems Engineering be in the 21st Century?
Systems Engineering as INCOSE knows it, or engineering of a wide variety of systems?
- ◆ Are these different views?
- ◆ How do we prepare engineers for 21st Century systems?

The 2002 Academic Forum will address these questions from two vantage points. The morning sessions will focus on today's need for qualified Systems Engineers. What are the qualifications? Who should accredit university programs? What is industry doing to increase the supply? The afternoon sessions will focus on expanding the application of Systems Engineering to diverse human systems beyond engineering products and processes. How is Systems Engineering being applied to these broader systems? What curriculum challenges are being presented by new approaches? What collaboration patterns does this suggest for individual educators? What competition intensity will educators face; that is, will the market be approaching saturation or expanding faster than our capacity to serve it?

The forum will consist of invited talks and panel discussions by your esteemed INCOSE colleagues. Ample time will be allotted for facilitated audience participation. Please join us.



MONDAY, 29 JULY (CONTINUED)

- 1300-1700 **OPTIONAL HALF-DAY (AFTERNOON) TUTORIALS**
- Tutorial H04 Systems Engineering, Architecting and Business Process Reengineering (BPR)**
Howard Eisner, *The George Washington University*
- Tutorial H05 Systems Engineering: What is the Minimum Set?**
Derk Bol, *ADSE BV*
- Tutorial H06 EMC (Electromagnetic Compatibility) – An Inseparable Part of Electronic System Design Program**
Eli Recht, *Independent EMC Consultant*
Elya B. Joffe, *K.T.M. Project Engineering*
Moshe Netzer, *RAFAEL*

1800-2000 **ICE BREAKER OPENING RECEPTION**

TUESDAY, 30 JULY

- 0700-1700 **Symposium Registration**
- 0730-0900 **Continental Breakfast**
- 0900-1030 **OPENING PLENARY SESSION**
Keynote Speaker: Margaret S. (Peg) Billson
Chief Technology Officer, Honeywell Aerospace
- INFORMATION AND PAPER SESSION 0**
- 1045-1135 **Tech Board Open House**
- 1045-1135 **Track 3, Session 0: Systems Engineering Standards**
- 1045-1135 **3.0.0 Panel: The Future of Systems Engineering Standards**
- 1045-1135 **Track 4, Session 0: Process: Applications: Mining and Mineral**
- 1045-1135 **4.0.0 Panel: SE in the Mining and Mineral Processing Industry**
- 1045-1135 **Track 5, Session 0: Process: Defense**
- 1045-1135 **5.0.1 Partitioning National Defence into Portfolios**
S. Cook, *Systems Engineering and Evaluation Centre*
T. Moon, *Defence Science and Technology Organisation*
L.J. Vencel, *VCORP Consulting Pty Ltd.*
- 1045-1135 **5.0.2 Applying Integrated Product and Process Development (IPPD) on the U.S. Army Multi-Role Armament and Ammunition System (MRAAS)**
R.D. Moulder, *James Gregory Associates, Inc.*
M.V. Cilli, *TACOM-ARDEC*
- 1045-1135 **Track 6, Session 0: Applications: Electronics & Photography**
- 1045-1135 **6.0.1 Selection Process for System Design Using Field Programmable Gate Arrays**
C. Mirchandani, *Lockheed-Martin Space Operations*
- 1045-1135 **6.0.2 Analysis of the Unique Navigation Requirements for Long-Range Oblique Photography**
H. Krauss, *ELOP Electro-Optics Industries, Ltd.*
- 1135-1230 **Lunch in Exhibit Hall**
- 1230-1435 **PAPER SESSION 1**
- 1230-1435 **Track 1, Session 1: Education**
- 1230-1435 **1.1.0 Highlights of the Academic Forum**
W. Wells, *University of Nevada, Las Vegas*
- 1230-1435 **1.1.1 Educating Systems Engineers: Encouraging Divergent Thinking**
W. McCumber, C.D. Sloan, *EagleRidge Technologies, Inc.*
- 1230-1435 **1.1.2 The 'Learn from Experience' (Lfe) Journey in Systems Engineering**
B. Meakin, B. Wilkinson, *BAE SYSTEMS, Underwater Weapons Div. UK*
- 1230-1435 **1.1.3 Systems Engineering in COTS-Based Systems**
L.H. Fan, *University of Maryland University College*

INCOSE 2002 ACADEMIC FORUM

ENGINEERING 21ST CENTURY SYSTEMS: CURRICULUM CHANGES AND NEW APPROACHES

MONDAY, 29 JULY
*TO BE HELD AT
THE TOP OF
THE RIVIERA HOTEL*

- 0830 **Introductions**
Bill Wells
- 0845 Morning Invited Speaker
Bob Tufts
Learning Systems Engineering
- 0930 Audience Discussion
John Clouet, Facilitator
- 1015 *Break*
- 1030 Panel Discussion:
Dennis Buede, Chair,
Terry Bahill, Phil Brown, &
Wolt Fabrycky
INCOSE Membership in ABET: Pros and Cons
- 1115 Audience Discussion
- 1200 **Lunch on-site**
- 1300 Afternoon Invited Speaker
John Boardman
Human Activity Networks
- 1400 Audience Discussion
Allen Fairbairn, Facilitator
- 1430 *Break*
- 1445 Panel Discussion:
Jack Ring, Chair, David Wright,
Steve Krane, Wayne Wymore,
Rod Belcher
Is SE Evolving Fast Enough?
- 1530 Audience Discussion
- 1615 Wrap-Up
Donna Rhodes
- 1630 **Adjourn**



TUESDAY, 30 JULY (CONTINUED)

PAPER SESSION 1

- 1230-1435 **Track 2, Session 1: Analysis and Use Cases**
- 2.1.1 Systems Engineering Realization and Introduction of a Market Model**
B. Genz, A. Vollerthun, *Technische Universität München*
 - 2.1.2 Use of Constraint Programming Techniques for Systems Pre-Sizing Involving Several Technical Fields**
P. Kou, C. Regniez, P. Pagniez, *Dassault Aviation*
 - 2.1.3 Functional Analysis for Existing Products: A Detailed Procedure**
V.A. Lentz, B. Lerner, *Otis Elevator Company*
 - 2.1.4 Use Case Development Integrated in a System Engineering Environment**
D.K. Smith, *EDS PLM Solutions/SLATE Deployment Services*
 - 2.1.5 Does Object-Oriented System Engineering Eliminate the Need for Requirements?**
J. Kasser, *UniSA*
- 1230-1435 **Track 3, Session 1: Systems Thinking**
- 3.1.1 The Case for Systems Management**
H. Mooz, K. Forsberg, *Center for Systems Management*
 - 3.1.2 Organizing for Successful System Development**
P. Rosen
 - 3.1.3 How to Nurture Systems Engineering In House: A Case Study**
S. Katz, A. Zonnenshain, H. Mizrahi, H. Nisenboim, *Rafael*
J.G. Lake, *Systems Management international*
 - 3.1.4 Emergence: A Partial History of Systems Thinking**
G. McConnell, *BAE SYSTEMS*
 - 3.1.5 Priority Determination Methods: A Priority Theory Basis**
T. Gilb, *Result Planning Limited*
- 1230-1435 **Track 4, Session 1: Applications: ERP and Others**
- 4.1.1 A Case Study in the Replacement of Legacy Systems with an ERP System**
R. Raynor, *New Mexico State University*
 - 4.1.2 Requirements Definition WSTF Project Management Software Integration**
M.M. Fiala, L.J. Bamford, S.P. Rohe, *New Mexico State University*
 - 4.1.3 Architecting a National Transportation System**
W.T. Nelson, A.D. Nelson, *The Boeing Company*
 - 4.1.4 Toward a Mathematical Theory of Systems Engineering Management**
E. Honour, *Honourcode Inc.*
 - 4.1.5 Methodology Development for Systems Verification, Validation and Testing**
A. Vollerthun, *Institute of Astronautics, Technical University of Munich*
A. Engel, *Israel Aircraft Industries (IAI)*
C. Haskins, *Norwegian Systems Engineering Council*
- 1230-1435 **Track 5, Session 1: Processes: Defense**
- 5.1.0 Panel: SE Process for a Coalition Integrated Air Picture**
 - 5.1.1 Towards Continuous Integrated Process Improvement**
I.I. Langenberg, *Thales Naval Nederland B.V./Business Unit Combat Systems*
J.F.B. Gieskes, *University of Twente, School of Management*
 - 5.1.2 A Systems Engineering Methodology for Combat Systems**
R. Merritt, *SEEC*
- 1230-1435 **Track 6, Session 1: Applications: Railways**
- 6.1.0 Panel: Light Rail Systems**
 - 6.1.1 Implementing SE and ODM in Railway Projects: Innovating a Conservative Line of Business**
M.H. van der Ploeg, *Railinfrabeheer*
 - 6.1.2 Dynamic Interface Management in a Transport Infrastructure Project**
L. Wildenburg, *ADSE B.b.v. Consultancy & Engineering Service*
P. van Klunen, *Project Organisation HSL-Zuid*



TUESDAY, 30 JULY (CONTINUED)

- 1455-1700 **PAPER SESSION 2**
- Track 1, Session 2: Education: Training**
- 1.2.1 Computer Based Training: A Structured Solution Accommodating Diverse Learning Styles**
E.P. Arnold, *United Defense International*
- 1.2.2 Better Systems Engineering with Dialogue**
G. Backlund, J. Sjunnesson, *Combitech Systems AB*
- 1.2.3 A Structured Approach to Developing a Systems Capability**
S. Goodlass, A. Phillipson, *BAE SYSTEMS*
- 1.2.4 Systems Engineering Educational Support Using an Embodied Conversational Agent – Can A Virtual Instructor Really Provide Learning Support to Students and New Faculty?**
R. Leibbrandt, *Defense Acquisition University*
- 1.2.5 Capstone Design in Education: Systems Engineering and the West Point Way**
M.J. Kwinn, Jr., E. Pohl, M. McGinnis, B. Carlton, *United States Military Academy*
- 1455-1700 **Track 2, Session 2: UML For Systems Engineering**
- 2.2.0 Panel: UML for SE**
- 2.2.1 Operational Concepts and the Case for Use Cases: Unifying UML with Systems Engineering**
R. Jorgensen, *Rockwell Collins, Inc.*
- 2.2.2 Analysis of the Rational Unified Process**
J.N. Martin, *The Aerospace Corporation*
- 1455-1700 **Track 3, Session 2: Risk Management**
- 3.2.0 Panel: Evaluating Your Risk Management Program**
- 3.2.1 A Project Manager's User's Guide to Risk-Based Decision Support Products**
B.B. Roberts, D. Frost, *Futron Corporation*
- 3.2.2 A Risk Management Approach for Effective COTS Acquisition and Life Cycle Support**
G. Shaffer, *Federal Aviation Administration*
G. McPherson, *TRW, Inc.*
- 1455-1700 **Track 4, Session 2: Applications: Enterprise Systems**
- 4.2.1 Enterprise Infrastructure Capability Assessment**
J. Ring, *Innovation Management*
- 4.2.2 Organizational Safety: A Systems Engineering Perspective**
S. Jackson, *The Boeing Company*
- 4.2.3 Systems Engineering Approach for Modeling an Organizational Structure**
G. Rushton, *Visteon Corporation*
A. Zakarian, T. Grigoryan, *The University of Michigan - Dearborn*
- 4.2.4 Human-Agent Collaboration: Ontology and Framework for Designing Adaptive Human-Agent Collaboration Architectures**
A.M. Madni, W. Lin, C. Madni, *Intelligent Systems Technology, Inc.*
- 4.2.5 Requirements Management by the Numbers: Applying Common Criteria Beyond the INFOSEC Arena**
K.J. Kepchar, J. Yeager-Key, *Federal Aviation Administration*
- 1455-1700 **Track 5, Session 2: Process: SE Principles**
- 5.2.0 Panel: Is SE Evolving Fast Enough?**
- 5.2.1 FRAT – A Basic Framework for Systems Engineering**
B.G. Morais, *Synergistic Applications, Inc.*
B.W. Mar, *University of Washington*
- 5.2.2 Creating Innovation Within a Structured Systems Engineering Framework**
K. Dutcher, *General Motors*



TUESDAY, 30 JULY (CONTINUED)

PAPER SESSION 2

1455-1700

Track 6, Session 2: Applications: Transportation

- 6.2.1 The Concepts of Systems Engineering as Practiced by the Wright Brothers**
D. Buede, *Stevens Institute of Technology*
- 6.2.2 Development and Application of Computer Aided Systems Engineering Processes for Korean Next- Generation High Speed Railway Train**
I.S. Yoo, Y.W. Park, *Ajou University*
- 6.2.3 Application of Computer-Aided Systems Engineering to Develop Automatic Train Control (ATC) System for Automated Guided Transit (AGT) System**
J.Y. Lee, Y.W. Park, J.K. Ahn, *Ajou University*
W.D. Lee, J.K. Mok, *Korea Railroad Research Institute*
- 6.2.4 Design Centers - Transferring Experience from Astronautics to Aeronautics**
F. Stephan, *Institute of Astronautics, Technical University of Munich*
W. Markus, M. Helmut, *Fairchild-Dornier*
W. Martin, *3d Systems Engineering GmbH*
- 6.2.5 Supporting Concept Development Using Quantitative Requirements Traceability**
K. Sutinen, J. Malmqvist, *Chalmers University of Technology*
L. Almfelt, *Volvo Cars Corp/Chalmers University of Technology*

1700-1800

EXHIBITS SOCIAL HOUR

WEDNESDAY, 31 JULY

0700-1700

Symposium Registration

0730-0815

Continental Breakfast

0815-0900

PLENARY SESSION

Invited Speaker: Virginia Dunstone
Life Enhancement Institute

0900-1000

Poster Session

1020-1225

PAPER SESSION 3

Track 1, Session 3

1020-1225

1.3.0 Virginia Dunstone Workshop

Track 2, Session 3: Capability Models

- 2.3.1 The Impact of CMMI Maturity on Innovation**
D.D. Walden, *General Dynamics*
- 2.3.2 Lessons Learned for Systems Engineering Capability Assessments**
R.B. Wray, *Lockheed Martin Naval Electronics & Surveillance Systems*
- 2.3.3 System Engineering Best Practices for Small Development**
J.M. Jacques, *University of Maryland University College*
- 2.3.4 Experience with Extending CMMI for Safety Related Applications**
M. Bofinger, N. Robinson, P. Lindsay, *Software Verification Research Centre*
A. Pitman, M. Spiers, M. Ashford, *Defense Materiel Organisation*
- 2.3.5 Systems Engineering Beyond Capability Models**
W.W. Schoening, *The Boeing Company*
S.A. Sheard, *Software Productivity Consortium*

1020-1225

Track 3, Session 3: Requirements Management

- 3.3.1 Tools for Requirements Discovery, Creation and Elicitation**
H.J. Heydt, *Idaho National Engineering & Environmental Laboratory*
- 3.3.2 The Communications Requirements Evaluation & Assessment Prototype (CREAP)**
J. Kasser, S. Cook, *UniSA*
- 3.3.3 Separating Product and Process Requirements**
C.D. Abadi, T. Bahill, *University of Arizona*
- 3.3.4 Requirements Variability Management**
R. Jorgensen, *Rockwell Collins, Inc.*
- 3.3.5 Specification Principles and Recommendations**
D.A. Jones, *Raytheon Company*



WEDNESDAY, 31 JULY (CONTINUED)

- 1020-1225
- PAPER SESSION 3**
- Track 4, Session 3: Innovation**
- 4.3.1 Innovation and Technology Management**
J.J. Simpson, *The Boeing Company*
- 4.3.2 Can NASA's Integrated Product Teams Become "Hot Groups"?**
R. Lovell, *Northrop Grumman*
- 4.3.3 Systems Engineering on the Dark Side of the Moon**
D.H. Rhodes, *CSG Systems*
- 4.3.4 NASA Technology Assessment Using Real-Options Valuation**
R. Shishko, G. Fox, D.H. Ebbeler, *Caltech/NASA Jet Propulsion Laboratory*
- 4.3.5 A Question of Context – Why Manufacturing Cultures Don't Understand Systems Engineering**
R.C. Iliff, *Independent Consultant*
- 1020-1225
- Track 5, Session 3: Process: SE and the Internet**
- 5.3.0 Panel: SE and the Internet**
- 5.3.1 Introducing Innovative Technology in a Contract-Driven Environment**
K.N. Myers, J. Beckley, *Lockheed Martin Corp.*
- 5.3.2 Addressing the People Problem – ISO/IEC 15288 and the Human-System Life Cycle**
S. Arnold, *QinetiQ*
J. Earthy, *Lloyd's Register of Shipping*
B. Sherwood-Jones, *Process Contracting, Ltd.*
- 1020-1225
- Track 6, Session 3: Applications: Transportation**
- 6.3.0 Panel: Role of SE in Intelligent Transportation Systems**
- 6.3.1 An Implementation of a Process Centred Collaborative Engineering Environment within the Satellite Industry**
R. Hartmann, U. Knirsch, *Astrium GmbH*
- 6.3.2 Applications of Conditional Inferential Methods for Operational Cost Savings for US Coast Guard C130 Aircraft Maintenance**
M.A. Powell, *University of Idaho at Idaho Falls*
E.B. Sheppard, Jr., *U.S. Coast Guard*
- 1225-1315
- Lunch in the Exhibit Hall**
- 1315-1435
- Working Group Meetings**
- PAPER SESSION 4**
- 1455-1700
- Track 1, Session 4: Education: Curricula**
- 1.4.1 Application of Systems Engineering Principles in the Creation of a New Master of Science in Systems Engineering Degree Program**
R.M. Harwell, *SYSTEM Perspectives*
- 1.4.2 Space System Concept Center, A CDC in an Educational Environment**
M.M. Schiffner, *Institute of Astronautics, Technical University at Munich*
- 1.4.3 Designing a New Airport Using a System Engineering Approach in a Classroom Exercise**
M.W. Ludema, *Delft University of Technology*
- 1.4.4 Combined Research and Curriculum Development in Information-Centric Systems Engineering**
M. Austin, J. Baras, N. Kositsyna, *Institute for Systems Research, University of Maryland*
- 1.4.5 A Systems Approach to Open-Inquiry Evaluation of Engineering Programmes**
M. Harris, *Systems Engineering and Evaluation Centre, University of South Australia*
- 1455-1700
- Track 2, Session 4: Capability Models & Metrics**
- 2.4.1 Integrating Beyond Capability Maturity Models**
L. Ibrahim, *Federal Aviation Administration*
- 2.4.2 New Approach to Generic Attributes**
C. Wells, *I-metrics LLC*
L. Ibrahim, *Federal Aviation Administration*
- 2.4.3 Verification "Auditability" Can Be "Free"**
J.H. Jones, *Optants Documented Decision Support Company (ODDSO)*
- 2.4.4 Prediction of Information System Availability in Mission Critical and Business Critical Applications**
M. Hecht, *SoHaR Incorporated*
- 2.4.5 Multistage System Integration**
J.Z. Ben-Asher, M. Tahan, *Technion*



WEDNESDAY, 31 JULY (CONTINUED)

- 1455-1700 **PAPER SESSION 4**
Track 3, Session 4: Requirements Challenges
3.4.0 Panel: The Requirements Swamp: Sifting Out Real Stakeholder Needs
3.4.1 Were the Ancient Egyptians Systems Engineers?
B. Jacobs, *University of Maryland*
- 1455-1700 **Track 4, Session 4: Systems Engineering for Business**
4.4.1 Systems Engineering Techniques in Support of Business Improvement
D. Kemp, J. Cole, *UK MOD Warship Support Agency*
4.4.2 From Systems Engineering to Service Engineering
M. Wieser, *Technische Universität München*
4.4.3 It's the People that Matter – Applying a Systems Engineering Approach to Process Improvement
D. Kemp, *UK MOD Warship Support Agency*
E. Carver, *BAE SYSTEMS*
4.4.4 A Value-Based Approach to Process Management
R.J. Dausch, *Northrop Grumman Space Systems Division*
4.4.5 Systems Engineering Starting in the Middle of a Program
J.R. Armstrong, *Software Productivity Consortium*
- 1455-1700 **Track 5, Session 4: Process: SE & Technology**
5.4.1 ProACT™: Process-Aware Zero Latency System for Distributed, Collaborative Enterprises
A.M. Madni, C.C. Madni, *Intelligent Systems Technology, Inc.*
J. Salasin, *Defense Advanced Research Projects Agency*
5.4.2 Understanding Enterprise Behaviour: A Feasibility Study
B. Clegg, *De Montfort University*
M. Turner, *Elipsis Ltd.*
5.4.3 IEEE 1471 and Systems Engineering
M.W. Maier, *The Aerospace Corporation*
D. Emery, *The Mitre Corporation*
R. Hilliard, *ConsentCache*
5.4.4 Optimizing Distributed Software Architectures for Ground Based Weapon Systems
Y. Lacerte, *Architecture Technology Corporation*
5.4.5 Web-Based Process Documentation – Getting Over the “Paper Mentality” Hurdle
L.D. Pohlmann, *Strategics Consulting*
- 1455-1700 **Track 6, Session 4: Environmental Applications**
6.4.0 Panel: SE Planning for Environmental Quality
6.4.1 Applied Systems Analysis and Fuzzy Optimization to Water Quality Management Problems
L. Doukas, D. Kildea, J. Sappakitkamjorn, *RMIT University*
6.4.2 Knowledge-Based Decision-Support System Design for Water Quality Assessment in Distribution Networks
L. Doukas, H. Zhou, F. Roddick, *RMIT University*
- 1800-1900 **SYMPOSIUM RECEPTION**
1900-2130 **BANQUET**

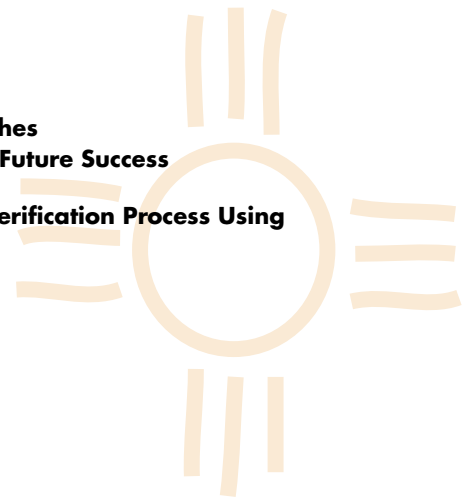
THURSDAY, 1 AUGUST

- 0700-1700 **Symposium Registration**
0730-0815 **Continental Breakfast**
- 0815-1020 **PAPER SESSION 5**
Track 1, Session 5: SE Issues
1.5.0 Discussion of Dr. Ramo Video Presentation
1.5.1 Issues in Representation of Things and Requirements Specification
T.L.J. Ferris, *University of South Australia*
1.5.2 Capability Maturity Model Integration (CMMI) Process Using Unified Modeling Language (UML) for Flight Safety Process Modernization at a Major Range Test Facility Base
R.M. Gonzales, *TMA Corporation*
D. Donahue, C. Eubanks, *Altech Services, Inc.*
E. Gonzales, *New Mexico State University*
1.5.3 Grand Systems Verification
J.O. Grady, *JOG System Engineering, Inc.*



THURSDAY, 1 AUGUST (CONTINUED)

- 0815-1020 **PAPER SESSION 5**
Track 2, Session 5: Modeling and Simulation
- 2.5.1 Assessing the Reliability of Socio-Technical Systems**
A. Gregoriades, A. Sutcliffe, J.E. Shin, *University of Manchester Institute of Science and Technology*
 - 2.5.2 Modeling and Simulation of Military System Architectures Using CORE®**
D. Cropley, *University of South Australia*
 - 2.5.3 Overcoming the Obstacles to Systematic Design Reuse**
R. Cole, *Raytheon Systems Company*
 - 2.5.4 Modeling the Cost Objective: Insight for Practitioners and Academicians**
F.J. Snyder, G. Parnell, *U.S. Military Academy at West Point*
 - 2.5.5 A System Theoretical Framework for V & V**
W. Wymore, *The University of Arizona*
- 0815-1020 **Track 3, Session 5: Requirements Management**
- 3.5.1 A Prototype Tool for Improving the Wording of Requirements**
J. Kasser, *UniSA*
 - 3.5.2 Requirements Engineering with Goal-Driven Use Cases**
R. Kaffenberger, *Marconi Communications GmbH Germany*
 - 3.5.3 Product Line Requirements Management**
M. Sutherland, *Galactic Solutions Group, LLC*
 - 3.5.4 A COTS-Aware Requirements Engineering Process: A Goal- and Agent-Oriented Approach**
K. Cooper, L. Chung, *The University of Texas at Dallas*
 - 3.5.5 Integrated Cost/Schedule Risk Analysis**
D.T. Hulett, *Hulett & Associates, LLC*
B. Campbell, III, *Northrop Grumman Corporation*
- 0815-1020 **Track 4, Session 5: SE Against Terrorism**
- 4.5.0 Panel: The Role of SE in Combatting Terrorism**
 - 4.5.1 Anti-Terror Meta-Systems Engineering**
K. Palmer
 - 4.5.2 Architecting An Engineering Documentation System**
S.A. Recker, *The Boeing Company*
- 0815-1020 **Track 5, Session 5: Process: Architecture**
- 5.5.1 Architectural Abstractions**
R.W. Jorgensen, I.W. Philpott, *Rockwell Collins, Inc.*
 - 5.5.2 A Generic Methodology for Partitioning Product Architectures**
B. Gaso, *University of St. Gallen*
C. Whitcomb, *Massachusetts Institute of Technology*
 - 5.5.3 Enabling Systems Architecture Tradeoffs Using a Systems Integration Framework**
B. Kalathil, D. Moore, C. Huggins, *Lockheed Martin Management & Data Systems*
 - 5.5.4 Design of the Concept of a New System Using ICDM – The Integrated, Customer Driven, Conceptual Design Method**
M.P. Weiss, *Technion*
 - 5.5.5 Systems Engineering with ICDM – A Case Study**
J. Herscovitz, A. Hari, *RAFAEL*
- 0815-1020 **Track 6, Session 5: Applications: Space**
- 6.5.0 Panel: Comparison of Space Systems Integration Approaches**
 - 6.5.1 CloudSat System Engineering: Techniques That Point to a Future Success**
R.J. Boain, R.R. Basilio, T. Lam, *Jet Propulsion Laboratory*
 - 6.5.2 Restructuring the International Space Station Integrated Verification Process Using Quality Function Deployment and Decision Analysis**
B. Haskins, *The Boeing Company*
- 1045-1215 **PLENARY SESSION**
Invited Speaker: Ken Salter
Disney Imagineering
- 1215-1315 **Lunch in Exhibit Hall**





THURSDAY, 1 AUGUST (CONTINUED)

- 1315-1520 **PAPER SESSION 6**
Track 1, Session 6: Formal Methods, Decision-Making and Flexibility
- 1.6.1 A Strategy for Designing Optimal Complex Systems Solutions**
T. Shell, *DarkLake Synectics*
 - 1.6.2 Formalizing a Structured Natural Language Requirements Specification Notation**
K. Cooper, *The University of Texas at Dallas*
M. Ito, *The University of British Columbia*
 - 1.6.3 Decision-Making for Generation Capacity Planning under Imperfect Information**
N. Leeprechanon, S. Moorthy, R. Brooks, M. Ellis, J. Sappakitkamjorn, *RMIT University*
 - 1.6.4 Information Technology Training**
J.H. Beach, E.A. Balough, D. Nogic, M. Rains, S. Williams, M. Kwinn
USCC and USMA Systems Engineering Department
 - 1.6.5 The Case for Flexibility in System Design**
K. Marais, D. Hastings, D. Newman, *Massachusetts Institute of Technology*
J. Saleh, *McKinsey & Co.*
- 1315-1520 **Track 2, Session 6: Model-Driven Design & Tool Applications**
- 2.6.1 Model Driven Design with Matlab**
E. Reitz, *Lockheed Martin Corp.*
 - 2.6.2 Integrated SE and PDM Tool Support for Medium Sized Companies**
R. Vonno, N. Boersema, *ADSE Consultancy and Engineering*
G. Smeets, *MiQ*
 - 2.6.3 The Verification Allocation Database (VAD) – A Simple Tool for Project Verification Scope Definition and Control**
A. Abramovici, *MD Robotics*
 - 2.6.4 An Initial Application of AP-233**
W. Scott, S. Cook, D. Harris, *University of South Australia*
J. Johnson, J. Smith, *BAE SYSTEMS*
 - 2.6.5 Designing a Supply Chain Analysis Framework**
M.W. Ludema, *Delft University of Technology*
- 1315-1520 **Track 3, Session 6: Managing Priorities**
- 3.6.1 The Concept Exploration Phase and Successful Coaching of Systems Engineering**
K. McGuire, *Northrop Grumman Corporation*
 - 3.6.2 Managing Priorities: Deadline Pressure Control**
T. Gilb, *Result Planning Limited*
 - 3.6.3 Where Does Software Engineering Begin During Systems Engineering?**
C.S. Lee, *University of Maryland University College*
 - 3.6.4 Market Your Systems Engineering with Business Skills**
T.J. Farwell, *The Boeing Company*
 - 3.6.5 Architecting Systems For Human Space Flight**
G.F. Wocken, *Boeing Space & Communications*
C.H. Dagli, *University of Missouri-Rolla*
- 1315-1520 **Track 4, Session 6: Medical Applications and Human Systems Engineering**
- 4.6.0 Panel: Information Technology Advances in Telemedicine**
 - 4.6.1 Towards an Improved Understanding of Humans as the Components that Implement Systems Engineering**
J. Axelsson, *Volvo Car Corporation*
 - 4.6.2 A Systems Case Study Examination of the Near-Catastrophic Mir-Progress 234 Collision with Emphasis on the Human Factors Issues Surrounding this Mishap**
D. Holland, *University of Virginia School of Medicine*
- 1315-1520 **Track 5, Session 6: Process: Architecture**
- 5.6.1 Characterizing the Relationships Between Product Developers and their Customers**
W.W. Schoening, *The Boeing Company*
 - 5.6.2 Decision Making in Modular Product Platform Development**
C. Ofer, *Technische Universität München*
K.N. Otto, C. Whitcomb, *Massachusetts Institute of Technology*
 - 5.6.3 Lessons Learned: Applying Tools and Methodologies to Develop C4ISR Architecture Framework Complaint Architecture Products**
A. Meilich, *Lockheed Martin Mission Systems*
D. Rice, *Popkin Software*
 - 5.6.4 Application of the C4ISR Architecture Framework: What Does it Really Mean?**
S.A. Hyer, *Johns Hopkins University Applied Physics Laboratory*
 - 5.6.5 Advancing Systems Engineering for Systems-of-Systems Challenges**
P. Chen, J. Clothier, *DSTO*



THURSDAY, 1 AUGUST (CONTINUED)

1315-1520

PAPER SESSION 6

Track 6, Session 6: Applications Infrastructure

- 6.6.1 A Systems Engineering Approach to Filling India's Telecommunications Gap**
S.G. Barkley, University of Maryland University College
- 6.6.2 System Integration in the Power Utility Industry: Lessons Learned**
A. Rothweiler, University of Maryland University College
- 6.6.3 Safety Management Systems Assessment at Yellowstone National Park**
C. Plowman, R.S. Alessi, Idaho National Engineering & Environmental Lab
- 6.6.4 Introducing Systems Engineering in the Fast Track: XYZ Wireless Data Solutions Goes One Step Beyond**
J. Ransyn, M. Verhoeven, R. Vonno, ADSE Consultancy and Engineering
- 6.6.5 Performing Trade Studies in the CERCLA Environment**
K. Jamison, M. Borland, Idaho National Engineering & Environmental Lab
P. Rice, Applied Engineering Services Inc.

1545-1700

CLOSING PLENARY AND INCOSE BUSINESS MEETING

CORPORATE ADVISORY BOARD (CAB) MEMBERS

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Vitech Corporation
Xerox Corporation



Please Note: Registration for the Yucca Mountain and Nellis Air Force Base Tours **must be completed on-line no later than 22 April in order to comply with Security procedures.** Details and restrictions can be found at: www.incose.org/symp2002/.

YUCCA MOUNTAIN TOUR

THURSDAY, 25 JULY, 0600-1630

FEE \$10/PERSON

Tour Yucca Mountain, the site of what could be the United States' first nuclear waste geologic repository.

Experts throughout the world agree that the most feasible and safe method for disposing of highly radioactive materials is to store them deep underground. Based on this consensus, the United States Congress passed the Nuclear Waste Policy Act of 1982 that directs the United States Department of Energy to find a site and characterize it. If the site is found suitable and a license application is approved by the Nuclear Regulatory Commission, the Department of Energy is to build and operate an underground disposal facility, which could be part of the nation's first long-term solution to a compelling environmental problem.

You can be part of that experience by touring this unique and fascinating place. Your Yucca Mountain Project host and tour guide will take you from Las Vegas by first-class motor coach approximately 100 miles north into the heart of the Great Basin Desert. You will pass the training base for the United States Thunderbirds Aerial Demonstration Squadron, past the main entrance to the Nevada Test Site, site of over 1,000 above-ground and underground nuclear detonations, to the Yucca Mountain site. You will drive to the top of the mountain and be escorted into tunnels within the mountain to see the testing that is underway. You will also be introduced to scientists, engineers, and technicians who can answer your specific questions. There is no where else on earth where this can be experienced. Don't miss this once-in-a-lifetime opportunity.

Due to the nature of this unique site and its proximity to other government activities, there are restrictions on visitors (minimum age – 14 years, additional restrictions are listed on the Symposium web site.) For national security reasons, all tour participants must register far in advance of the tour date. **No registration will be available for this tour at the Symposium.** We encourage you to decide and register quickly to participate in this exciting and informative **all-day** tour. The only expense to the tour participant is a \$10.00 charge for a box lunch that will be provided.

More information about Yucca Mountain is available on the World Wide Web at: www.ymp.gov.

NELLIS AIR FORCE BASE TOUR

FRIDAY, 2 AUGUST, 0830-1230

FEE: \$10/PERSON

Tour Nellis Air Force Base, "Home of the Fighter Pilot" and home of the **United States Air Force Air Warfare Center, the United States Air Force Air Demonstration Squadron – The Thunderbirds, the USAF Weapons School, and Red Flag,**

The Air Warfare Center, established in October 1995, manages advanced pilot training and integrates many of the Air Force's test and evaluation requirements. The Thunderbirds are the United States Air Force Air Demonstration squadron. The USAF Weapons School teaches graduate-level instructor courses, which provide the world's most advanced training in weapons and tactics employment to officers of the combat air forces. Red Flag is the premiere combat training exercise involving the air forces of the United States of America and its allies.

Your tour will take you to the "Petting Zoo," the Air Force's term for an area set aside to exhibit some of the "gadgets" they have developed or collected over the years; the flight line where you will see some of the world's most advanced aircraft including a possible sighting of the newest aircraft in the United States arsenal, the F-22 super fighter; and, last but certainly never least, the Thunderbirds Air Demonstration Squadron. This is a "don't miss" opportunity!

As with the tour to Yucca Mountain, due to the nature of this unique site and its proximity to other government activities, there are restrictions on visitors (minimum age – 14 years, additional restrictions are listed on the Symposium web site.) For national security reasons, *all tour participants must register at least 90 days in advance of the tour date.* **No registration will be available for this tour at the Symposium.** We encourage you to decide and register quickly to attend this exciting and informative **half-day morning** tour.

More information about the United States Air Force Thunderbirds Air Demonstration Squadron is available on the World Wide Web at www.airforce.com/thunderbirds/. More information about Nellis Air Force Base is available on the World Wide Web at: www.nellis.af.mil/.

HOOVER DAM TOUR

FAMILY TOUR

FRIDAY, 2 AUGUST, 0830-1230

FEE: \$30/PERSON

Tour one of America's grandest achievements, Hoover Dam, which towers 560 feet above the Colorado River. You will have time to explore the top of the Dam and view the winged statues, historical tributes, and the spillways. The Visitor Center offers an outstanding view of the Dam and features a movie on the history of the Dam and the surrounding area, along with an interesting lecture by one of the Dam guides. The Exhibit Gallery features interactive multimedia presentations about the construction of the dam and the ecology of the desert southwest.

Please note: This tour must meet a 30-person minimum by Friday, July 12, or it will be subject to cancellation. Register for this event on the INCOSE Symposium Registration form found on the Symposium web site.



ABOUT INCOSE

Learn more about INCOSE at our website: www.incose.org

INCOSE is an international organization formed to develop, nurture, and enhance the interdisciplinary approach and means to enable the realization of successful systems. INCOSE works with industry, academia, and government to:

- ◆ Provide a focal point for dissemination of systems engineering knowledge
- ◆ Promote collaboration in systems engineering education and research
- ◆ Assure the establishment of professional standards for integrity in the practice of systems engineering
- ◆ Encourage governmental and industrial support for research and educational programs that will improve the systems engineering process and its practice.

We are a dynamic and growing organization. In 11 short years, our growth has exceeded 3,900 members and 33 chapters (with several more forming). The local chapters, volunteer committees, and working groups provide the energy and direction for the organization. The overall orchestration of INCOSE is the responsibility of an Executive Committee consisting of the President, Past President, Secretary, and Treasurer. The Executive Committee comprise part of the Board of Directors which guides INCOSE activities. The Corporate Advisory Board provides additional guidance and recommendations, as well as serving as the "voice of the consumer" for our products. INCOSE's meeting cycle has evolved into two major annual meetings - a business/workshop in January, and a mid-year technical symposium. The symposium is one of INCOSE's foremost events, drawing 700 participants for four days of technical exchange, paper presentations, panel discussions, tutorials, and an academic forum.

Throughout the year, there are regional conferences organized by INCOSE chapters. We offer many products, including proceedings from the annual symposia in formats of printed volumes and CD-ROM, handbooks and guidebooks, a systems engineering journal, and our Internet offerings. Our quarterly newsletter, INSIGHT, has grown to over 60 pages per issue and serves as one of the many ways we communicate with our membership. INCOSE has a presence on the World Wide Web and conducts online discussions through Internet listservers.

INCOSE TECHNICAL COMMUNITY:

TC = Technical Committee WG = Working Group IG = Interest Group
(Refer to the INCOSE Web site: www.incose.org/techcomm.html for detailed information on these groups.)

EDUCATION & RESEARCH TC

Concepts and Terms WG
Education Development WG
Educational Measurements WG
SE Body of Knowledge WG
SE Certification WG
Systems and Supportability
Interface Research WG

MEASUREMENT TC

Capability Assessment WG
Measurement WG

MODELING & TOOLS TC

Model Driven System Design WG
Tools Database WG
Tools Integration and Interoperability WG
Information Model & Process IG
Soft Systems Engineering IG

PROCESS & METHODS TC

Human Systems WG
SE Handbook WG
Systems Architecture WG
Principles IG
SE and the Internet IG

SE APPLICATIONS TC

Commercial and Public Interest WG
Environmental Systems WG
Infrastructure Systems Engineering WG
Intelligent Enterprises WG
Joint Commercial Aircraft WG
Space Systems WG
Telecommunications WG
Community Practices IG
Health Care IG
Motor Vehicles IG
Railway Transportation IG

SE INITIATIVES TC

Anti-Terrorism International WG

SE MANAGEMENT TC

Requirements WG
Risk Management WG
SE Management Methodology WG
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Configuration Management IG

STANDARDS TC

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BENEFITS:

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12TH ANNUAL INTERNATIONAL INCOSE SYMPOSIUM REGISTRATION FORM

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Register by 19 July to be included in the Symposium List of Participants!

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FULL - Includes Sessions, Exhibits, Reception, Symp. Meals, CD Proceedings INCOSE Member # _____	\$660	\$725	\$ _____
MEMBERSHIP RENEWAL (optional)	\$80	\$80	\$ _____
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STUDENT MEMBERSHIP RENEWAL (optional)	\$10	\$10	\$ _____
NON-MEMBER REGISTRATION (NEW MEMBER)			
FULL - Same as FULL Member but includes \$80 annual membership fee	\$740	\$805	\$ _____
STUDENT (full-time) Same as Student Member but includes \$10 annual membership fee	\$65	\$65	\$ _____
ONE-DAY REGISTRATION			
1-DAY - Includes Sessions, Exhibits Circle one: Tues., 30 July Wed., 31 July Thurs, 1 Aug	\$305	\$330	\$ _____
INCOSE Membership Fee (optional)	\$80	\$80	\$ _____
TUTORIALS (SUNDAY)			
H00 SE Fundamentals Tutorial (PM) (no cost, but space is limited) Yes I plan to attend <input type="checkbox"/>			
F00 SE Specifications Quality Control (Full Day)	\$250	\$300	\$ _____
TUTORIALS (HALF-DAY - MONDAY)			
Please indicate your first (1) and alternate (2) choices for AM and/or PM.			
H01 Leveraging Six Sigma in SE (AM)	\$135	\$160	\$ _____
H02 Making SE Intelligent (AM)	\$135	\$160	\$ _____
H03 Applying Decision Analysis Techniques to Risky Decisions (AM)	\$135	\$160	\$ _____
H04 SE, Architecting, and Business Process Re-engineering (BPR) (PM)	\$135	\$160	\$ _____
H05 SE, What is the Minimum Set? (PM)	\$135	\$160	\$ _____
H06 EMC: An Inseparable Part of Electronic System Design Program (PM)	\$135	\$160	\$ _____

	BY 17 JUNE	AFTER 17 JUNE	
TUTORIALS (FULL DAY - MONDAY)			
Please indicate your first (1) and alternate (2) choices.			
F01 Maximizing the Systems Aspect of SE	\$250	\$300	\$ _____
F02 Managing Requirements	\$250	\$300	\$ _____
F03 Process Modeling in a SE Context	\$250	\$300	\$ _____
F04 Grand Systems Verification	\$250	\$300	\$ _____
F05 Fault Analysis for SE	\$250	\$300	\$ _____
F06 OT&E: Validating the Users' Need	\$250	\$300	\$ _____
F07 Essential Principles and Processes for SE CANCELLED	\$250	\$300	\$ _____
F08 Requirements and Modeling: A Structured Approach	\$250	\$300	\$ _____
F09 Applied Statistical Decision Theory for SE	\$250	\$300	\$ _____
F10 Knowledge Engineering for SE	\$250	\$300	\$ _____
F11 System Safety for SE	\$250	\$300	\$ _____
ACADEMIC WORKSHOP (MONDAY)			
Academic Workshop (includes lunch)	\$90	\$135	\$ _____
EVENT TICKETS FOR GUESTS, AND EXTRA PROCEEDINGS			
Ice-Breaker Reception**	\$25 ea.	x	\$ _____
Symposium Banquet**	\$70 ea.	x	\$ _____
Lunch: <input type="checkbox"/> Tues. ** <input type="checkbox"/> Wed. ** <input type="checkbox"/> Thurs. **	\$25 ea.	x	\$ _____
Proceedings (CD-ROM)**	\$60	x	\$ _____
**Included with FULL registration; lunch and CD-ROM included with one-day registration			
Black Kokopelli Symposium Golf Shirt (Indicate size: S M L XL)	\$20	x	\$ _____
OPTIONAL TOUR (REGISTER BY 12 JULY)			
Hoover Dam Tour	\$30	x	\$ _____
OPTIONAL TECHNICAL TOURS (SEE PAGE 16 FOR DETAILS. YOU MUST REGISTER BY 22 APRIL FOR THESE TOURS.)			
Yucca Mountain, Thursday, 25 July	\$10	x	\$ _____
Nellis Air Force Base, Friday, 2 August	\$10	x	\$ _____
TOTAL REMITTANCE \$			\$ _____

REGISTRANTS: If you **DO NOT** want your name published in the "List of Symposium Participants," please mark here:

HOTEL INFORMATION AND RESERVATIONS



HOTEL AND SYMPOSIUM SITE

The Riviera Hotel in Las Vegas is the headquarters for INCOSE 2002. A block of rooms at discounted rates has been reserved for delegates who identify themselves as INCOSE Symposium participants. Guests are encouraged to make their own hotel reservations early, directly with the hotel, to be assured of their preferred accommodations. When making reservations, **be sure to mention INCOSE 2002**. Discounted **rates apply until the reservation deadline of 1 July 2002 or until all rooms in the group block have been reserved**. After 1 July, guest rooms and group rates may not be available. We encourage you to *confirm your reservations early and in writing* to avoid any confusion. Credit card numbers are required to guarantee reservations. There is a \$10.90 cancellation fee that applies anytime you cancel the reservation. You will receive a refund of the balance of your deposit if you cancel by 12 noon Pacific Time two (2) days prior to your arrival date. Please inquire with the hotel regarding parking rates, check-in and checkout times, early departure fees, etc.

The Riviera Hotel is centrally located, with over 2,100 newly renovated rooms, four great shows, two specialty restaurants, a buffet, a 24-hour coffee shop and a unique food court, 24-hour casino excitement, a full service health club, more than 45 shops and services, a gorgeous pool, two tennis courts, an arcade, and free parking.

THE RIVIERA HOTEL

2901 Las Vegas Blvd South
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Telephone: 1 800 634 6753 or +1 702 794 9412
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INCOSE Guest Room Rates:

Single/Double Rate: \$72 plus 9% Tax

For more information about The Riviera Hotel, please visit:
www.rivierahotel.com

CUSTOMS, GROUND TRANSPORTATION, WHAT TO DO IN LAS VEGAS:

No optional evening excursions have been planned because of the ease and availability of a variety of activities in the Las Vegas area. For detailed information about Las Vegas, please visit: www.lasvegas.com and for ground transportation, and customs information. For Symposium updates, please visit the Symposium web site: www.incose.org/symp2002.

DRESS GUIDANCE

Attire for all INCOSE Symposium sessions and events is "business casual." Slacks and shirts with collars are recommended. For the INCOSE Banquet, the 2002 Planning Committee is recommending business casual attire. Normal summer temperatures often exceed 100°F. To check on weather conditions for Las Vegas, click on: www.weather.com/weather/local/89109. While enjoying the dry heat of the Las Vegas region, delegates are encouraged to consume plenty of fluids, use an effective sunscreen, and be cautious about spending long periods of time outdoors.

HOW TO REGISTER

The **Online Registration Form** can be found on the Symposium web site at www.incose.org/symp2002/registration/registration.htm

CONFIRMATION OF REGISTRATION

Payments may be made by **credit card** or **check** payable to **INCOSE**. To pay by bank transfer, please contact PCMI at incose@pcmisandiego.com for wire transfer instructions. Confirmation letters will be mailed or emailed within two weeks of receipt of registration form **and payment**. If you do not receive a confirmation letter within three weeks of payment of fee, please contact PCMI by fax, e-mail, or telephone.

If payment is to be made by purchase order, *please ensure that correct billing information is furnished in the space provided on the Symposium Registration Form*. Payment is due within thirty (30) days of receipt of registration. In the case of purchase orders, confirmation letters will be mailed along with an invoice. **NO PURCHASE ORDERS WILL BE ACCEPTED ON-SITE. Payment in full of all Symposium registration fees must be made by, or at the time of, on-site registration.**

SYMPOSIUM CANCELLATION POLICY

If you enroll and cannot attend, the registration fee less a \$50 (US\$) processing fee will be refunded if *a written request is received by PCMI by 12 July 2002*. For cancellations after that date, 50% of the fee paid will be deducted from the refund. No refunds will be given to registrants who fail to cancel by to 22 July 2002, or who do not show up on site. In the case of a cancelled event, the full event fee will be refunded.

Please Note: *If you register as a non-member (new member) or renewing INCOSE member, and you register for the Symposium by check or credit card, and then cancel your registration, the \$80 (US\$) membership fee will be retained. This also applies to registrants who are replaced by another attendee. If you fall into this category and have paid by purchase order, your registration and membership fees will not be invoiced, your membership fee will not be credited, and you must pay INCOSE directly for your membership.*

Questions? For further information and assistance, please contact:

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INCOSE 2002 PROGRAM SUMMARY

July 25 Optional Yucca Mountain tour (Register by April 22)
July 28 Free tutorial on Systems Engineering Fundamentals
Advanced tutorial on Competitive Systems Engineering
July 29 Academic Forum
Optional half-day and full day tutorials
Ice Breaker Reception 1800 - 2000
July 30 Plenary Speaker Peg Billson, Honeywell
Introduction to INCOSE Technical Committees and
Opportunities to Participate in Working Groups
Paper and Panel Sessions
July 31 Plenary Speaker Virginia Dunstone
Paper and Panel Sessions
Hands-On Working Group Meetings
Paper and Panel Sessions
Banquet with Las Vegas entertainment
August 1 Paper and Panel sessions
Plenary Speaker Ken Salter, Disney Imagineering
Paper and Panel sessions
Closing Plenary and INCOSE Business Meeting
August 2 Optional Tours to
Nellis Air Force Base (Register by April 22)
Hoover Dam