

SAIEE/INCOSE

14 August 2014



South Africa

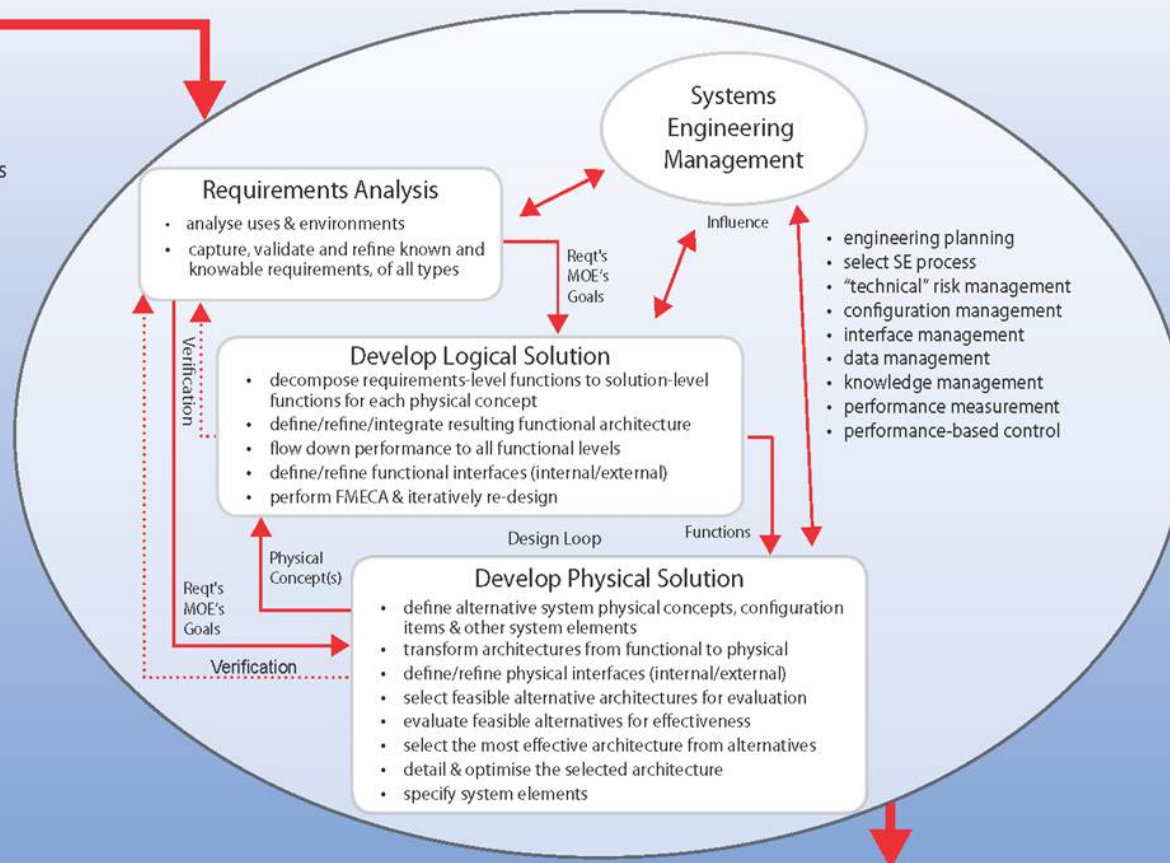
What is SE?

Systems Engineering is an **interdisciplinary, collaborative approach to the engineering of systems** (of any type) which aims to **capture stakeholder needs and objectives** and to **transform these into a description of a holistic, life-cycle balanced system solution** which both satisfies the minimum requirements, and maximizes overall project and system effectiveness according to the values of these stakeholders. Systems engineering incorporates both technical and management processes.”

(Halligan, 2003)

PROCESS INPUT

- problem domain info
- user/customer/other stakeholder needs/ desires/wants/goals/ requirements/expectations
- uses/missions
- measures of effectiveness
- value information
- environments
- other constraints
- technology base
- concurrent engineering – related inputs



Note 1: The Systems Engineering Process is applied repeatedly to each design object, starting at, for example, the Capability, Mission or Use System, then to, for example, the Prime Mission or Use Product, Maintenance System, Production System, Operational Infrastructure, etc, then to subsystems of these systems.

Note 2: Also, where applicable, validate data products (not shown diagrammatically)

Note 3: The process also controls the integration of the system elements to build the system for the first time (system integration).

Note 4: The process also includes the conduct of verification of the produced system against the requirements for that system, thereby verifying both the system, and the design of the system.

Note 5: The process also includes the conduct of validation of the produced system against the need.

PROCESS OUTPUT

- identification & specification of each system element, including build instructions
- requirements traceability information
- system & system element verification requirements
- design traceability information (decision data base)
 - system functional & physical architecture and detail descriptions
 - design decision support data
 - design decision rationale data
- concurrent engineering-related outputs
- prototypes, where applicable

INCOSE – The International Council on Systems Engineering



South Africa

INCOSE

is a **not-for-profit membership** organisation founded to develop and disseminate the interdisciplinary principles and practices that enable the realisation of successful systems.

INCOSE Mission

- Share, promote and advance the best of systems engineering from across the globe for the benefit of humanity and the planet.



Sector 1
Americas

Sector 2
EMEA

Sector 3
Asia &
Oceania

INCOSE Working Groups

The heart of Technical Operations is its 40 Working Groups, working on technical projects and products of value to INCOSE stakeholders:

- Affordability
- Anti-terrorism International
- Architecture
- Autonomous System & Evaluation
- Biomedical
- Complex Systems
- Cost Engineering
- Decision Analysis
- Defense Systems
- Global Earth Observation System of Systems
- Human Systems Integration
- Infrastructure
- In-Service Systems
- Intelligent Enterprises
- Knowledge Management
- Lean Systems Engineering
- Life Cycle Management
- MBSE Initiative
- Measurement
- Motor Sports
- Net-centric Operations
- Object-Oriented SE Method
- Power & Energy Systems
- Process Improvement
- **Reliability Engineering**
- Requirements
- Resilient Systems
- Risk Management
- SE Effectiveness
- Space Systems
- Standards Initiative
- Systems Safety Integration
- Systems Security Engineering
- Systems Science
- Tools Database
- Tools Integration & Operability
- Training
- Transportation
- Verification & Validation
- Very Small and Micro Entities

More information from website <http://www.incose.org> follow Home>Advancing the Practice>Technical Operations

Publications & Products

- *INSIGHT*, quarterly publication
- *Systems Engineering* – INCOSE quarterly journal
- *Enterprise Transformation* – Quarterly journal
- Annual Proceedings – i-Pub (from the symposia)
- Products from Working Groups
 - Free to the public on the Web (www.incose.org)
 - Tools Database
 - Technical Resource Centre
 - From the Members Area of the Web
 - *Systems Engineering Handbook*
 - *Measurement Primer*
 - Products available for purchase through INCOSE

SEP Certification



ASEP	Associate Systems Engineering Professional
CSEP	Certified Systems Engineering Professional
ESEP	Expert Systems Engineering Professional
- Acq	Acquisition Extension for US DoD

INCOSE SA Chapter Overview

- Established in 2002 as a Section 21 company
- In 2006 INCOSE SA re-constituted as a Non-Profit Association of Professional Persons
- Gauteng-based with Western Cape Branch
- Active Members: approx. 450
- Chapter Management Committee (CMC)
- Details – see Website <http://www.incose.org.za/>



Membership Benefits

- Network with approx. 10'000 multi-national SE professionals at events and via webinars
- Participate in INCOSE events
 - Annual International Symposium (IS)
 - Annual International Workshop (IW)
 - Sector Conferences (e.g. EMEA)
 - Chapter Conferences
- Participate in Technical Working Groups
- Access to INCOSE SE Body of Knowledge (SEBoK)
 - SEBoK Ver 1.3 is available in wiki format www.sebokwiki.org

Membership Benefits

- Access to INCOSE publications and products
- Attend events and symposia at discounted rates
- Earn CPD points for membership and attending INCOSE events
- INCOSE SA registered with ECSA as a Cat A Voluntary Organisation

INCOSE SA Member Services

- Events & Activities
 - Conferences and Tutorials (1 or 2 per year)
 - Chapter meetings Gauteng (4 per year)
 - Chapter meetings Western Cape (4 per year)
 - SEP Certification (training)
 - Continuing Professional Development (CPD)
- Communications
 - Website
 - e-News (ad hoc)
 - LinkedIn

INCOSE SA Activities

- Technical Working Groups
 - Reliability Engineering (Albertyn Barnard)
 - SE Training (Alwyn Smit)
 - Standards (Johann Amsenga)
- EMEA Sector Conference 2014
 - 27 to 30 October 2014
 - In place of annual INCOSE SA conference

Like to Join?

All this for a mere.....

R575 per annum!

R375 per annum for students!

<http://www.incose.org.za/>

EMEASEC 2014

- The ninth biennial Systems Engineering Conference of the Europe, Middle-East and Africa (EMEA) Sector of INCOSE (EMEASEC 2014)
- Formerly the 'European Systems Engineering Conference (EuSEC)'
- Hosted by the INCOSE South Africa Chapter with the support of other EMEA Chapters
- First EMEA Sector conference outside Europe

EMEASEC 2014 - THEME



- Exploring New Horizons
 - Inspired by the Millennium Project commissioned by the United Nations Secretary General in 2002 to develop a concrete action plan to address key global challenges such as poverty, hunger and disease facing humanity across the globe
 - The conference aims to focus application of Systems Thinking and Systems Engineering theory, principles, processes and tools to the 15 global challenges identified by the Millennium Project
 - Sub-themes will be derived from the 15 global challenges
 - Papers and tutorials are invited on Engineered Systems, Natural Systems and Social Systems, with emphasis on the latter two

EMEASEC 2014 - FEES

Category	INCOSE Members		Non-Member
	Normal	Student	
Full Delegate	R6 000	R3 600	R6 900
Paper Presenter	R4 800	R3 000	R5 700
Tutorial Presenter	R0	R0	R0

EMEASEC 2014 – SEP EXAM

Start on the path to INCOSE
Systems Engineering Certification at
EMEASEC 2014 !

WHAT IS CERTIFICATION?

Certification is a formal process whereby a community of knowledgeable, experienced, and skilled representatives of an organization, such as INCOSE, provides confirmation of an individual's competency (demonstrated knowledge, education, and experience) in a specified profession. Certification differs from licensing in that licenses are permissions granted by a government entity for a person to practice within its regulatory boundaries. Certification also differs from a "certificate" that documents the successful completion of a training or education program.

CERTIFICATION VALUE TO YOU AS A SYSTEMS ENGINEER

- Formally recognizes your Systems Engineering capabilities
- It is a discriminator that can aid in obtaining your next job
- Can provide a competitive advantage in your career
- Provides a portable Systems Engineering designation that is recognized across industry
- Furthers your professional development as a systems engineer
- Demonstrates your commitment to continuing professional development.

CERTIFICATION VALUE TO YOUR ORGANIZATION

- Formally recognizes the Systems Engineering capabilities of your people
- Certified systems engineers can be a selling point and a discriminator for your proposals
- Can be used as part of the hiring and promotion process
- It encourages employee participation in continuing education
- Provides an independent internal and external assessment



THE CERTIFICATION EXAM – FREE AT EMEASEC 2014

- The INCOSE SE Certification Program is currently based on v3 of the INCOSE SE Handbook. V4 of the Handbook is due for release at the International Symposium in June. In order to make the switch to the new Handbook, the certification program will run a number of exam trials with a set of questions based on the SEHB v4 before the exam questions will be finalized.
- One such a trial is going to be run at the EMEASEC 2014 conference for free. The exam normally costs 120USD.
- Results will be provided by mail within one month.
- Successful candidates will have the opportunity to register at ASEP or CSEP level, depending on their experience.
 - ASEP applicants must pay the standard \$150USD application fee due within 3 months
 - CSEP applicants must pay the standard \$300USD application fee with proof of degree and required references within 3 months

Interested parties, even individuals who are
not INCOSE Members or do not plan to
attend the conference, should contact the
EMEASEC 2014 SEP Examination

Coordinator at:

smit.alwyn.gideon@gmail.com