



Requirements as a Tool for Quality

A Four-Hour Tutorial

System Quality is Measured Against Requirements

Requirements are the core definition of a system, providing the primary measure of system quality. Requirements management is one of the core tools of complex systems engineering. From beginning to end, good quality engineers use requirements to help the product system:

- Meet the operational and customer needs
 - Functional and Performance
 - Schedule
 - Total Ownership Cost
- Fit within the intended system environment
- Provide sufficient robustness and reliability
- Offer appropriate flexibility
- Meet the entire life cycle



Systems fit together when requirements are properly used to ensure quality.

You should attend this tutorial if you are:

- System Technical Leader
- Responsible for system quality
- Project Engineer
- System Support Leaders
- Technical and Management Staff
- Project Managers

Topics covered:

One of the most significant impacts a quality engineer can have on a project is to insure the proper identification, analysis and allocation of requirements. This course begins with the identification of sources and types of requirements. Specific examples of well-developed and poorly drafted requirements are presented along with guidelines to evaluate individual and sets of requirements. A process for conducting a requirements analysis is presented along with techniques to allocate the requirements to the system functional, operational and physical architectures. Source documents for guidance on drafting requirements documents are also presented along with some of the common software tools used to support requirements analysis and allocation.

Requirements and Quality – (30 minutes) How requirements contribute to and measure system quality. Measurement methods. Quality control with respect to system requirements.

Defining Requirements – (45 minutes) Types of requirements. Where requirements come from. Characteristics of quality requirements. Documentation methods for both contracted (one customer under contract) and product (commercially developed) systems. Specification writing methods and rules.

Requirements Analysis – (1 hour) Methods to ensure that systems requirements are complete, coherent, and cohesive. Diagramming techniques for functional flow block diagrams, structured analysis (data flow diagrams), object oriented analysis (UML diagrams), and IDEF diagramming. Strengths and weakness of each method.

Requirements Allocation – (30 minutes) Requirements as engineering tools during the system architecting and design phases. Allocation methods with examples. Application of requirements management techniques to handle continuous change. How to review quality characteristics during allocation.

Case Study – (30 minutes) Study of a real development project to evaluate the impact of requirements. Based on the Wright brothers development of the first operating airplane.

Summary – (15 minutes) Review of the material and key messages. Course evaluation.

The Presenter:

Mr. Honour has been in international leadership of the engineering of systems for nearly a decade, part of a 33-year career of complex systems development and operation. His energetic and informative presentation style actively involves class participants. He was the founding Chair of the INCOSE (International Council on Systems Engineering) Technical Board in 1994, was elected to INCOSE President for 1997, and continues as Director for Sponsored Research. He was selected in 2000 for Who's Who in Science and Technology. He has been a systems engineer, engineering manager, and program manager at Harris Information Systems, E-Systems Melpar, and Singer Link, preceded by nine years as a US Naval Officer flying P-3 aircraft. He has led or contributed to the development of 17 major systems, including the Air Combat Maneuvering Instrumentation systems, the Battle Group Passive Horizon Extension System, the National Crime Information Center 2000, and the DDC1200 Digital Zone Control system for heating and air conditioning. Mr. Honour now heads Honourcode, Inc., a consulting firm offering effective methods in the development of system products. Mr. Honour has a BSSE (Systems Engineering) from the US Naval Academy and MSEE from the Naval Postgraduate School.

