BURGE HUGHES WALSH

SYSTEMS ENGINEERING

2-day Systems Engineering Appreciation for Leaders Workshop

Workshop Description

Systems Engineering is the systematic application of Systems Thinking to the design and introduction of new systems. Applied correctly, Systems Engineering provides considerable strategic advantage by reducing introduction times, improving system performance and reducing through life costs. It is the only proven approach to handling risks associated with highly complex products and services. In simple terms Systems Engineering is just good engineering.

Deploying Systems Engineering successfully within an organization, requires an understanding of the implications of its adoption on the planning and delivery of new product introduction from research through to consideration of manufacturability, support and ultimately retirement. Project management has an important role to play as does the corporate governance structures necessary to the management of risk. In turn, key individuals must develop a profound grasp of the Systems Engineering philosophies and the role of governance, processes and tools in order to embed practice.

The purpose of the 2-day Systems Engineering Appreciation for Leaders Workshop is to ensure key personnel understand the implications and can contribute to the development of the vision and strategy for deploying Systems Engineering. The 2-day workshop will explain why Systems Engineering is needed and the benefits that will follow from its successful deployment. It will also offer the opportunity to attendees to appreciate what Systems Engineering actually involves and how it is of benefit to their organization in securing long term future product development. The workshop will also initiate the necessary debate around the vison and strategy that underpins the Systems Engineering deployment leading to an understanding of the changes that may be necessary.

Course Numbers and Who Should Attend?

The 2-day Systems Engineering Appreciation for Leaders workshop can be delivered to up to 20 participants. The workshop is aimed at engineering leaders and also leaders from adjacent functions such as commercial, project management, manufacturing, operations, test and quality.

Benefits to the Individual and Business

During an intensive two days of teaching and practical 'hands on' exercises, participants will be challenged to understand the implications of adopting Systems Engineering and they can contribute to the development of the vision and strategy for deploying Systems Engineering by:

- Understanding the need for Systems Engineering within their organization
- Understanding how Systems Engineering is built on the principles of systems thinking and how it applies through the appropriate blend of people, process and tools
- Understanding the critical role of requirements in engineering
- Having an appreciation of the process and tools that can be used to:
  - Gather, analyse and specify user and system requirements
  - Generate and down-select alternative design concepts and architectures
  - Optimise concept to ensure robustness
  - Verify and validate the system design
- Considering and debating the implications and impact of adopting a systems approach to engineering within their organization
- Contributing to a draft vision and strategy for deploying Systems Engineering within their organization.

Workshop Content

The workshop will comprise a number of sessions. The first day and half will be concerned with explaining what Systems Engineering is and more importantly how it is done. Participants will be taken through the Systems Engineering process via a simple case study. This will provide an opportunity to understand the rationale but also experience the type of tools that are necessary, the effort involved but also the benefits that can be realised. The last half day is dedicated to understanding the implications of deploying Systems Engineering in terms of processes, people, tools and infrastructure.

The outline content for the 2-day Workshop is given in the following table:

Day 1

- Introduction and Delegate expectations
- What is Systems Engineering?
  - Emergence as a key driver of System Engineering;
  - Know the causes of undesirable emergent behaviour and the need for a systems approach to engineering and how it differs from traditional engineering approaches.
- An Introduction to Systems Thinking
  - Concepts and benefits of applying Systems Thinking to the creation of a new, or modification to an existing system - aka Systems Engineering;
  - Key Systems Thinking concepts of emergence, purpose, context and structure, and know how they apply to engineering.
- Systems Engineering in Practice
  - Key ingredients of Systems Engineering: People, Process, Tools and Infrastructure
  - The two dimensions of Systems Engineering: Complexity and Lifecycle
  - The four design phases:
    - Determine Requirements
    - Create System Concept
    - Optimise System Design
    - Verify and Validate System
- A Systems Approach to Requirements
  - The importance and key role of requirements in Systems Engineering;
  - The common issues surrounding "customers" and their requirements;
  - The need for Requirements Engineering as a subset of Systems Engineering.
- Determine Requirements
  - The role of requirements in defining system purpose and context;
  - Introduced to the Holistic Requirements Model – a systems view of Requirements that highlights the importance of system functionality
  - The difference between User (Stakeholder) Requirements and System Requirements

Day 2

- Introduction and Review
- Create System Concept
  - The purpose of the Create System Concept Phase
  - The key process steps and what type of tools are appropriate
  - How to use system functionality to explore architectural and technological alternatives
  - Know how to down-select solutions
- Optimise System Design
  - The role of optimisation in Systems Engineering to develop robust and manufactureable designs
  - Know how subsystem requirements are specified specification
- Verify System
  - The purpose and role of verification and validation in Systems Engineering
- Deploying Systems Engineering in an organization
  - The behavioural shift needed
  - The necessary building blocks to deploying Systems Engineering (what does good look like?):
    - Lifecycle management, governance processes and mandates
    - Engineering development processes
    - Infrastructure requirements
    - Education, training and coaching
    - Understand the timescales and potential pitfalls
- Systems Engineering in the host organization
- Participants:
  - Debate the need for Systems Engineering
  - Debate and decide on a vision for Systems Engineering
  - Debate and decide on a Systems Engineering strategy
  - Decide the next steps
- Summary and close

Workshop Costs

This workshop is specifically aimed at the leadership of an organization and in consequence is facilitated by a Lead Consultant from BHW. The cost of delivering the 2-day workshop, excluding delivery tutor accommodation and expenses, but including all courseware for up to 20 participants is £5,360. VAT will apply at the prevailing rate. The course can be tailored to suit individual customer's operations.

BURGE HUGHES WALSH

QAS INTERNATIONAL ISO 9001:2015 REGISTERED FIRM

ENDORSED TRAINING PROVIDER

BURGE HUGHES WALSH LIMITED

First Floor, 6 Allerton Road, Rugby, Warwickshire CV23 0PA

enquiries@burgehugheswalsh.co.uk

www.burgehugheswalsh.co.uk

01788 550015