# Systems Engineering Workforce Evolution

2013 NDIA Systems Engineering Conference

Industry Panel: Best Practices for Systems Engineering Workforce Development

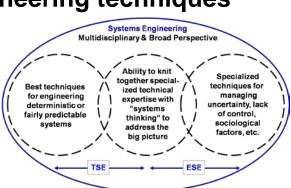
October 2013





# Systems Engineering for a Complex Future

- New complexity a consequence of networking many systems to achieve a collaborative advantage
  - Systems each individually adapting to rapid technology/mission changes
  - People are part of the enterprise
  - Environment for any one system becomes unpredictable
- Systems engineering in the face of complexity
  - Engineer the enterprise and the systems that enable it
  - Engineer adaptability of individual systems
  - Engineer adaptability of the network of constantly changing systems
- Requires a spectrum of systems engineering techniques
  - Disciplined methods of traditional forms
  - Big-picture systems thinking
  - Enterprise methods for harnessing and managing uncertainty
  - All required to achieve success







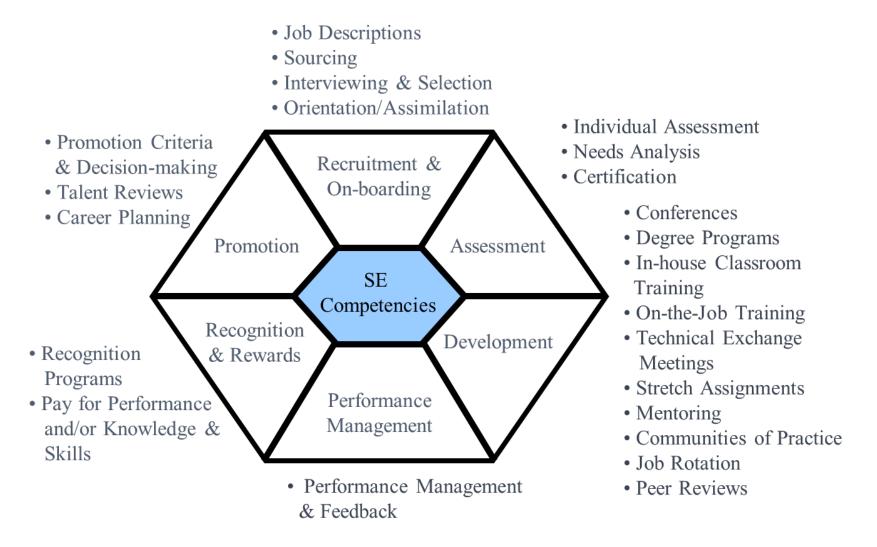
## **Define and Codify Attributes of Successful Systems Engineering**

- Defines the problem or opportunity from a comprehensive, integrated perspective
- Applies systems thinking to create strategies, anticipate problems, and provide short- and long-term solutions
- Proposes a comprehensive, integrated solution or approach that:
  - Contributes to achieving the strategic mission. objectives in a changing environment
  - Can be feasibly implemented within the political, organizational, operational, economic and technical context
  - Addresses interoperability and integration challenges across organizations
- Adapts to change and uncertainty in the program environment, and assists others in adapting
- Cultivates partnerships
- Brings their own and others' expertise to provide sound, objective evidence and advice to achieve a successful outcome

1.0 Enterprise Perspectives 5.9 Integrity .3 Foster Stakeholder Relationships 5.8 Adaptability 2.0 Systems Engineering Life Cycle 5.7 Results Orientation 2.1 Concept Definition 5.6 High Quality Standards 2.2 Requirements Engineering 5.5 Facilitating, Managing, and Championing Change 2.3 Architecture 5.4 Persuasiveness and Influence 2.4 Systems Design and Development 5.3 Communicating with Impact 2.5 Systems Integration 5.2 Building a Successful Team 2.6 Test and Evaluation 5.1 Building Trust 2.7 Systems Implementation, MITRE 5.0 Collaboration and Systems Individual Characteristics Engineer 3.0 Systems Engineering Planning and Management 4.9 Collaborating with Technical Specialties 3.1 Transformational Planning 4.8 Communications/Networking Engineering 3.2 Government Acquisition Support 4.7 Software and Information Engineering 3.3 Contractor Evaluation 3.4 Risk Management 3.5 Configuration Management 3.6 Integrated Logistics Support 4.0 Systems Engineering **Technical Specialties** 



# Align Processes and Programs with SE Accession & Development





### **Skill Currency & Evolution**

#### Hire individuals with strong academic foundation

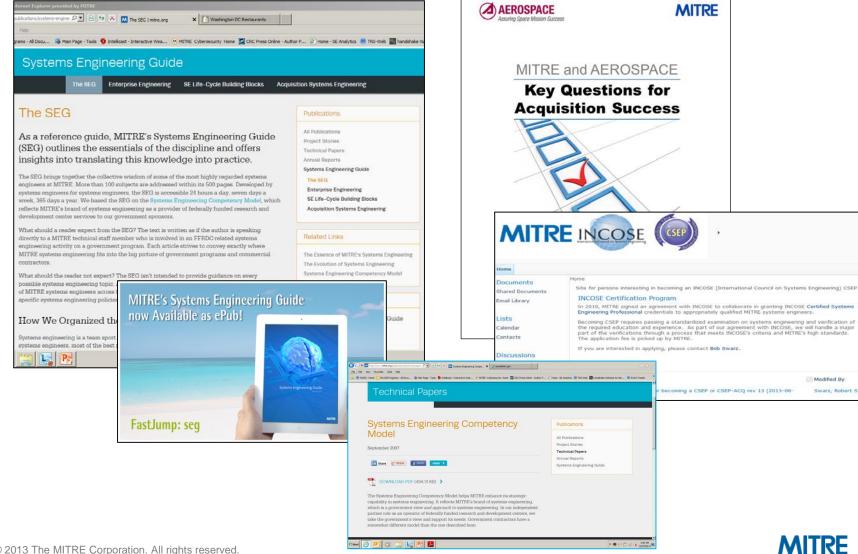
- Education aligned with organizational needs
- Staying technically current continuing education
  - Graduate-level university education in SE
  - 3-level in-house career competency training
  - Focused technical courses

#### Staying technically current – not just education

- Assignment rotation
- Embedding in different locations
- Mentoring
- Opportunities to interact with operational users
- Enable, facilitate career development opportunities across organizational lines
  - Ensure that organizational transfers don't break career mentoring



### Make Available Other Knowledge Resources



#### **Contact Information**

**George Rebovich** 

Tel: 781-271-8503

**Address: The MITRE Corporation** 

202 Burlington Road

M/S C375

Bedford, MA 01730

Email: <a href="mailto:grebovic@mitre.org">grebovic@mitre.org</a>

