Guide to the

Systems Engineering Body of Knowledge (SEBoK) version 0.75

The SEBoK v0.5 Adjudication Report

for SEBoK v.75 Release

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Version 0.75 of the SEBoK is a limited update where only about a third of the articles have been revised. As a result, many of the comments that were made during the review of SEBoK 0.50 have been deferred until the entire document is updated in SEBoK 1.0 during the spring and summer of 2012.

About a third of the comments applied to sections that are now updated for version 0.75, and many (but not all) of those comments were incorporated into the update. Each Part Team lead has provided a short summary of which of the review comments were addressed in version 0.75, and which were deferred.

Full adjudication of all comments made on versions 0.50 and 0.75 will occur prior to the final release of the SEBoK 1.0.

We thank the many reviewers who participated in the review of versions 0.25 and 0.50, for their careful, thoughtful, and learned comments. Many of them directly led to substantial improvements to the SEBoK. We believe the SEBoK is much better as a result of this review process, and we are grateful for the assistance. A list of the reviewers who contributed feedback and the organizations they represent are provided in the Acknowledgements article at http://www.sebokwiki.org/075/index.php/Acknowledgements.

Sincerely,

Art and Dave

Part 1: SEBoK 0.75 Introduction

Overall, Part 1 content has been updated with improvements based on review comments received for SEBoK 0.5 and to reflect the version 0.75 release. A new topic on *Economic Value of Systems Engineering* has also been added. Further revisions will be done for SEBoK 1.0 to clarify some issues raised by reviewers, e.g. the scope of SEBoK and the distinction between systems engineering and software engineering.

Part 2: Systems

Based on review comments received for SEBoK 0.5, and further review of draft SEBoK 0.75 content at the INCOSE International Workshop 2012 by members of the International Society of Systems Science (ISSS), Part 2 has been reorganized to provide a more logical flow of the topics

covered. The topics that were under Knowledge Areas (KA) *Systems Overview*, *System Concepts* and *Types of Systems* (in SEBoK 0.5) have now been modified and moved appropriately under the Knowledge Areas *Systems Thinking* and *System Science*. This modification is also expected to provide better clarity on the difference between generic systems knowledge and knowledge relevant to engineered product, service and enterprises systems contexts. Further refinement is still pending, and would be addressed in SEBoK 1.0. ISSS reviewers recommend consistent use of language and terminology (e.g. the term *Systems Approach*) that would be correct for both System Science and Systems Engineering readers.

Three issues were identified in the *Systems Approach* KA: incorrect usage of the term *analysis*, no discussion on *trade-off*, general content too close to SE in terminology and references. While the first two have been addressed in SEBoK 0.75 with the revised Part 2 structure, the third issue requires further review before it can be fixed in SEBoK 1.0. The *Systems Challenges* KA has not been updated for SEBoK 0.75, but will be for SEBoK 1.0.

In view of the emerging content of Parts 3 and 4, a number of articles describing fundamentals have been written. Some of the content of these articles may need to be moved to, or reflected in Part 2. Full review of this is pended for version 1.0.

Part 3: Systems Engineering and Management

In response to the review comments received for SEBoK 0.5, the content and maturity of some Part 3 articles was improved. A new KA *Concept Definition* has now been added in Part 3 for SEBoK 0.75 with two new articles *Mission Analysis* and *Stakeholder Needs and Requirements*. Further, based on the review comments received, the article *System Verification and Validation* was split into two separate articles on *System Verification* and *System Validation*. Similarly, the article on *Architectural Design* was also split into two articles *Architectural Design: Logical* and *Architectural Design: Physical*.

Only a subset of articles has been revised for SEBoK 0.75. Comments from the INCOSE Working Groups and a couple of other organizations were not available at the time of revision. These and other comments received for SEBoK 0.5 that have not been addressed in version 0.75 will be addressed in SEBoK 1.0. Many comments requested addition of new references like MITRE Systems Engineering documentation and NATO AC 327, and they will be considered for version 1.0.

Part 4: Applications of Systems Engineering

The KA *Product Systems Engineering* in Part 4 was not written in SEBoK 0.5. This KA and five articles under it have now been included in SEBoK 0.75: *Product Systems Engineering Background*, *Product as a System Fundamentals*, *Business Activities Related to Product Systems Engineering*, *Product Systems Engineering Key Aspects*, and *Product Systems Engineering Special Activities*. A few comments were received for the other three KAs and they will be addressed in SEBoK 1.0.

Part 5: Enabling Systems Engineering

Relatively few changes were made in Part 5 for SEBoK 0.75. While only a couple of articles have been updated now, more substantial updates are planned for SEBoK 1.0. Many review comments for SEBoK 0.5 had pointed out that the article *Deciding on Desired Systems Engineering Capabilities within Businesses and Enterprises* was hard to read. In response, the content article has been revised and the text expanded to explain the content of the major table in the article more clearly. Several other articles had minor improvements in their content.

Part 6: Related Disciplines

Part 6 was immature in SEBoK 0.5. Based on the suggestions of reviewers, many references were included and additional articles were added, including the KA on *Systems Engineering and Industrial Engineering*. The articles on *Lean Engineering*, *Resilience*, and *Environmental Engineering* were also added as a result of community review. The *Systems Engineering and Project Management* and *Systems Engineering and Software Engineering* KAs were also extensively updated.

Several comments were received from the INCOSE Working Groups after the editing process was nearly concluded. All of these were reviewed, though most were deferred to version 1.0, except for the addition of the article on *Lean Engineering*.

With the completion of version 0.75, the editors anticipate only minor architectural changes going forward to version 1.0. SEBoK 1.0 will use the review comments from versions 0.5 and 0.75 to refine the existing articles, while continuing to add content, illustrations, and references.

Part 7: Systems Engineering Implementation Examples

The nature of comments received for Part 7 in SEBoK 0.5 were not very critical and it was decided to focus author efforts to improve other Parts for SEBoK 0.75 that required more

immediate attention. Therefore, Part 7 has not been revised from SEBoK 0.5 for SEBoK 0.75. However, all review comments that have been received will be adjudicated in SEBoK 1.0. In addition, version 1.0 would also include additional case studies and vignettes, an updated matric mapping the case studies and vignettes to other parts of the SEBoK and standardization of the format used for the examples descriptions.